

## *Protea L. 1771*

Originally Linnaeus (in 1737, actually 1735) typified the genus *Protea* the Silvertree. Inexplicably Linnaeus assigned the King Protea to the genus *Leucadendron*. It was only in 1771 that Linnaeus changed his mind and sunk both genera into one and replaced the Silvertree with the King Protea as the type for the genus.

Exactly why Linnaeus made the original mistake (after all *Leucadendron* means White Tree and is thought to refer to the Silvertree) is unclear. However, it is clear that he recognized and was embarrassed by this oversight. In his early works (*Hortus Cliffortianus*), he waxed lyrical about the Silvertree: “This tree most shining and splendid of all plants” and “yes like Proteus himself extremely variable and different.” However, in 1771 he noted: “I note with much pleasure that the Leucadendrons are connected generically with the Proteas.” It was only in 1809 that Richard Salisbury again split the genera: he put the Silvertree into *Protea* and the King Protea into *Scolymocephala* (thistle-head). In 1810 Robert Brown put the Silvertree into *Leucadendron* for the first time, and the King Protea into *Protea*. In both cases it is Robert Brown’s generic names that have been conserved and are in use today.

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*Protea cynaroides* (L.) L. 1753,

**King Protea**

*Koningsuikerbos*

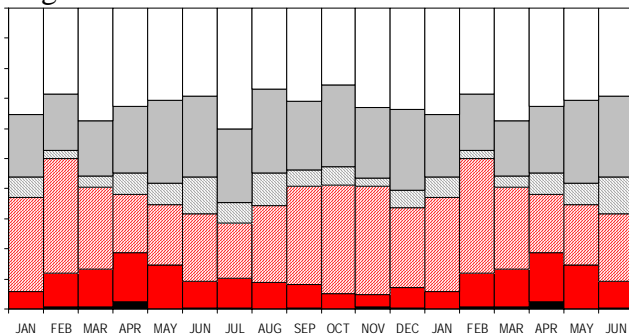
**Other Common Names:** Artichoke-flower Erodendrum, Big Protea, Giant Protea, Kings, Mountain-rose Sugarbush, Suikerroos, *Konigsprotea*, *Aprilprotea*, *Bergroos*, *Grootsuikerkan*, *Reuseprotea*, *Reussuikerbos*, *Waboomprotea*, *Waterprotea*, *Watersuikerkan*, *Indlungi* (Xhosa), *Isindhunge* (Swati), *Isindhlungu* (Swati), *Isigalaba* (Zulu), *Isiqwane* (Xhosa), *Izadlung*, *King Pink*, *King Red*, *Mini King*.  
**Other Scientific Names:** *cyclophylla* (Gand.) Gand. & Schinz. 1913, *cynaraeflorum* Salisb. ex Knight 1809, *erioletpis* (Gand.) Gand. & Schinz. 1913, *petiolata* Buek. ex Meisn. 1856, *woodwardii* Endl. 1848

**8678 Records**

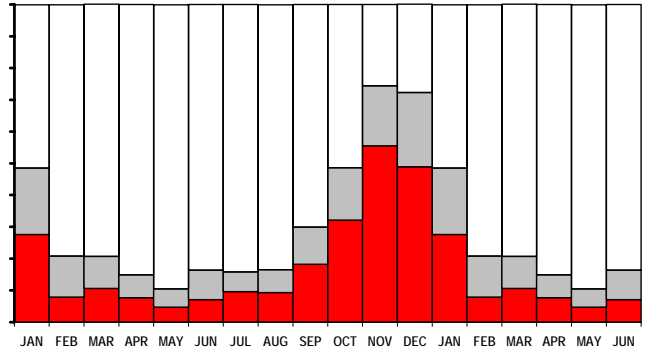
**Population** (8483 records): 7% Common, 62% Frequent, 30% Rare.

**Dispersion** (7309 records): 74% variable, 17% clumped, 7% widespread, 1% evenly distributed.

**Flowering** (8481 records with: Jan 785, Feb 685, Mar 824, Apr 651, May 653, Jun 506, Jul 566, Aug 537, Sep 996, Oct 923, Nov 687, Dec 668): Buds from Aug to Jun; Flowering, Peak Flowering and Over not significant; Fruit from Apr to Jan; Nothing from all year round. Peak levels at 53% in Feb. Historically recorded as flowering from all year round. Curiously, most buds never flower, but presumably abort or revert to growth.



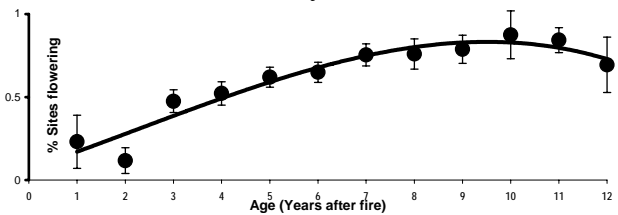
**Growth** (8348 records with: Jan 774, Feb 680, Mar 824, Apr 636, May 633, Jun 482, Jul 550, Aug 525, Sep 972, Oct 922, Nov 687, Dec 663): Much from Oct to Jan; Rare from Dec to Jan; None from all year round. Peak levels at 74% in Nov.



**Seedlings** (3532 records): Absent in 93%: fewer seedlings than prefire adults in 90 cases, and more in 41 cases. Seedlings found all year round (Jan: 13, Feb: 6, Mar: 14, Apr: 7, May: 13, Jun: 16, Jul: 12, Aug: 8, Sep: 9, Oct: 10, Nov: 10, Dec: 13).

**Fire Survival** (766 records): 92% resprouted from underground boles, 4% escaped fires in fire-safe areas, 2% survived by seedlings only, 1% resprouted from aerial trunks, 1% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4 years, and 100% recorded at 18 years.



**Height** (8541 records): 4% 0-0.2 m tall, 89% 0.2-1 m tall, 7% 1-2 m tall, 0.2% 2-5 m tall.

**Pollinators** (33 records): 42% birds, 30% beetles, 15% bees or wasps, 9% flies, 3% none observed.

**Detailed Pollinators** (18 records): Cape Sugarbird (11), Orange-breasted Sunbird (2), Honey Bee (2), Great Protea Beetle (2), Malachite Sunbird.

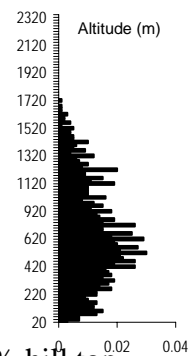
**Habitat:**

**Distance to Ocean** (8262 records): 87% inland - further than 2 km from coast.

**Altitude** (8265 records): 20 - 1760 m; 380 *lq* - 600 *med* - 860 *uq*m.

**Landform** (8184 records): 71% deep soil, 23% shallow soil, 5% rocky outcrops.

**Slope** (8179 records): 45% steep incline, 40% gentle incline, 8% hill top, 4% platform, 2% cliff, 1% valley bottom.



**Aspect** (7280 records): 45% South, 20% East, 18% North, 17% West.

**Soil Type** (8162 records):

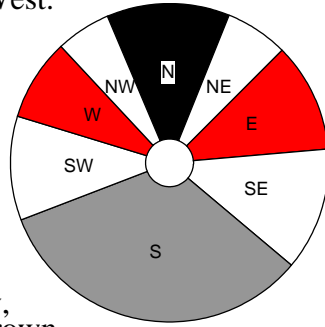
56% sandy, 24% loamy, 9% peaty, 6% rocky, 5% gravelly, 1% clayey.

**Soil Colour** (8125 records):

60% grey, 17% black, 17% brown, 5% white.

**Geology** (8119 records): 95% sandstone, 3% shale.

**Vegetation** (8230 records): 97% shrubland, 1% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 41 499 km<sup>2</sup> with 25% conserved and 18% lost; Occupancy: 4 715 km<sup>2</sup> with 48% conserved and 11% lost. Fragmentation index: 4 %.

**Nature Reserves** (8265 records): 66% in nature reserves - well conserved.

**Habitat destruction** (8038 records):

96% extensive natural habitat, 2% islands, 1% naturally linear habitats.

**Alien Invasive Species** (7979 records):

50% none, 35% *Pinus*, 7% *Hakea*, 7% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (7967 records): 50% alien-free, 43% sparse, 6% abundant, 1% dense.

**Cultivation & Utilization:**

**Picking** (5318 records): 99% no sign of picking, 1% lightly picked, 0.3% severely picked.

**Cultivation Status:** Plantings - 146 records (2%), Augmentations - 6 records (0.07%), Escapes - 3 records (0.03%).

**Witch's Broom Infestation:** 114 records (1%).

**Atlassers Notes:**

**Plant Habit:**

All gangly plants (BMJ96072101); Very tall on account of inter-growth with other restios (CVV95040904); All remarkably tall - response to competition in dense scrub (DFJ99032901); One plant 2.5-3.0 m high (DOA93041001); Tall & spindly because of thick growth round them (JAT95052601); Height remarkable (PVR92122601); Largest I have ever seen (VCH99120803); I would never have believed it could be so tall and numerous (VJK94080705);

Typically a very short plant in this area widespread but never very common (NAH96022404);

**Colour forms:**

White (KHA99051901, OUTY0012204); Pure white (PVR93041706); Cream/white (LYM99032801 + 2); Yellow/cream (LYM99040809); Unusual form with lemon yellow bracts (NAH92062001); One cream-coloured plant (SHR96021701); Pink and white (VJK93022104+5); Pure white about to open and pink in full bloom (VJK94080710); Deep red

(WMP95123008); **One plant differed - bracts deep pink/ red (?)**

**Variation**

Garden-Route variant (AGR91120715);

Incredibly large heads (AGR91122606);

**Predation and parasitism**

Cones all eaten / broken off (AGR94082819);

Cleared off by baboons in bud stage!

(AGR95040105); Bushes had been broken up ( baboons?) (APE92081603); Picking by baboons biting the buds off (GNI95012105); Baboons picking buds (looking for stem borers as they do not eat the buds)

(GNI95080902); Picking done by baboons no flowerheads left pick the buds - should be in full flower now in a young stage and eat part of it - most proteas are damaged in this way - only found heads with seeds in Rooiwaterspruit again (GNIY0120502);

Picking done by baboons biting off the flowerheads - no old flowerheads found (GNIY1032910);

Severe picking by baboons no old flowerheads bushes damaged by baboons when removing flowerheads (GNIY1032911);

Severe picking by baboons - no seedheads were found (GNIY1032915);

Baboon damage to buds (LYM98022804);

Cones often destroyed by baboons (NAH92062102);

Baboons have broken off all flowerheads (OUT98013106);

Apart from fire damage many plants (re-sprouting shoots) have been eaten down to ground level by a type of borer (CVV95021204);

Some branches torn off - all from one plant (APE92060610);

Often damaged: broken branch sites (MAJ92011501);

Picking - stems gnawed through (TLEY0050603);

Picking - stem gnawed through droppings of small animal beside plant (TLEY0050604);

Old leaves extensively grazed (WIJ97101205);

Infected with fungus (AMMY0010903); Many in this area are very small and have red spots on their leaves - perhaps a fungus (GCS99021002);

**Flowering**

Aborted buds on nearly all plants (PVR95022304);

Many with aborted buds (TLE95051305, TLE95052103);

Flowerbud but then changed into leaves (VCH98092601);

In spectacular flowering condition! About 30 flowers on some 5-6 plants: colour grey & pink. Plants in peak condition! Growing in quite moist shady area (WMP98041102);

**Recruitment**

Lots of young plants - good recruitment at last fire (AGR92022703);

Large numbers of young plants - many more times than adults obviously a good recruitment event!

(AGRY2010501); Seedlings with cotyledons outnumbering resprouters (AKS93050105);

Many young (AKS93073103); There were many seedlings (AVZ93112302);

Most are young plants / seedlings (CNR95051701);

Mixture of resprouters and small plants growing from seed (DJL93121301);

Good number of small plants scattered over plot (FBH95072202);

Seedlings only found in places where boles completely killed - ie not resprouting (JID93092001);

In one place

where killed by fire a number of young plants were evident (JID93110101); A few young plants - not resprouting - seen (LYM94110102); Many young (OUT95092314); Young plants also seen (TLE94022003); Quite old veld but some young plants present (TLE95043003);

**Mortality**

Some killed by fire! (AGRY3100113); 1 died, rest resprouted (AWA95081603); Many adults 3 - 5 height killed by fire (OUTY0091501); Burnt - no resprouting (SMR98042905);

Some dead - appears to be from old age (OUT95060301);

All Plants Look Near Dead (CNR95051001);

**Witches Broom:**

About 5% infected (NAHY0040801); 80% Infected (NAHY0070301);

**Misc.**

Being Picked Illegally! (VJK97090406);  
Ants present (MCG96032402, SHS93032301, WEL95030403, WEL95030501);

**Confusing Species:** Utterly distinct: the only *Protea* with a long leaf stalk, also a resprouter with huge heads. One record of mistaken for *P. eximia*.

Records of identification queries = 105.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** Add.

**Distribution:** Add.

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***Protea lorea* R.Br. 1810**  
**Thong-leaf Sugarbush**

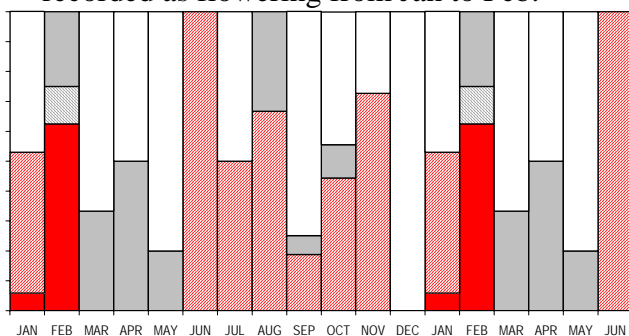
**Other Common Names:** Pine-leaf Erodendrum, *Sneeugrondprotea*.  
**Other Scientific Names:** *aulax* Hibb ex Meisn. 1856, *coronata* Curt ex Steudel 1821, *pinifolium* Salisb. ex Knight 1809.

**91 Records**

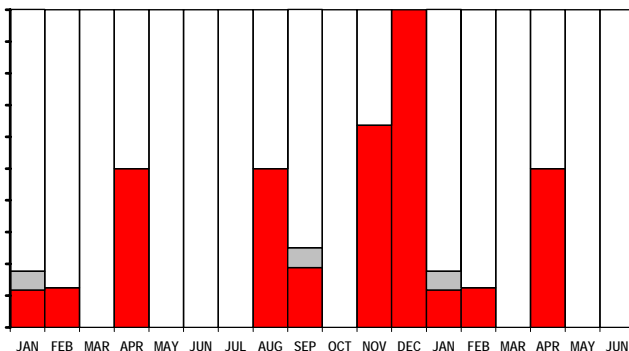
**Population** (86 records): 24% Common, 40% Frequent, 36% Rare.

**Dispersion** (73 records): 59% clumped, 40% variable, 1% evenly distributed.

**Flowering** (87 records with: Jan 17, Feb 8, Mar 3, Apr 2, May 5, Jun 1, Jul 2, Aug 6, Sep 16, Oct 9, Nov 11, Dec 7): Buds from Jan, Jun to Aug and Oct to Nov; Flowering from Feb; Peak Flowering not recorded; Over not significant; Fruit from Feb to May and Aug; Nothing from Jan, Mar to Jul and Sep to Dec. Peak levels at 75% in Feb. Historically recorded as flowering from Jan to Feb.



**Growth** (85 records with: Jan 17, Feb 8, Mar 3, Apr 2, May 5, Jun 1, Jul 2, Aug 6, Sep 16, Oct 7, Nov 11, Dec 7): Much from Apr, Aug and Nov to Dec; Rare not significant; None from Jan to Nov. Peak levels at 100% in Dec.



**Seedlings** (23 records): All without any seedlings present.

**Fire Survival** (16 records): 94% resprouted from underground boles, 6% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 2-3 years, and 100% recorded at 5 years.



**Height** (87 records): 76% 0-0.2 m tall, 24% 0.2-1 m tall.

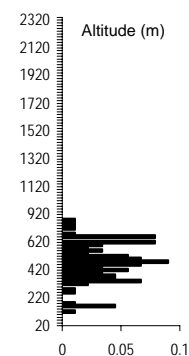
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (89 records): 100% inland - further than 2 km from coast.

**Altitude** (89 records): 100 - 780 m; 360 *l<sub>q</sub>* - 460 *med* - 520 *u<sub>q</sub>*m.



**Landform** (85 records):

93% deep soil, 6% shallow soil, 1% rocky outcrops.

**Slope** (89 records): 49% gentle incline, 38% steep incline, 6% hill top, 3% cliff, 2% platform, 1% valley bottom.

**Aspect** (83 records): 60% South, 18% West, 11% East, 10% North.

**Soil Type** (84 records):

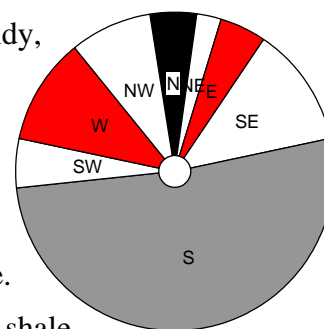
46% loamy, 30% sandy, 17% clayey, 6% gravelly, 1% peaty.

**Soil Colour** (85 records):

60% brown, 32% grey, 4% yellow, 2% black, 2% orange.

**Geology** (84 records): 62% sandstone, 30% shale, 8% granite.

**Vegetation** (84 records): 100% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened D2(ii). Occurrence (Fynbos): 3 660 km<sup>2</sup> with 31% conserved and 22% lost; Occupancy: 82 km<sup>2</sup> with 28% conserved and 14% lost. Fragmentation index: 1%.

**Nature Reserves** (89 records): 52% in nature reserves - well conserved.

**Habitat destruction** (84 records): 98% extensive natural habitat, 2% naturally linear habitats.

**Alien Invasive Species** (80 records): 48% *Pinus*, 39% none, 8% *Hakea*, 6% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (80 records): 39% alien-free, 55% sparse, 6% abundant.

**Cultivation & Utilization:**

**Picking** (51 records): 100% no sign of picking.  
**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

As you can see the bud develops very slowly - 3 months and not near maturity (VJK93110701);

Appears to flower more prolifically here judging by last years flowers (VJK93112003);

2 dead plants seen - no signs of resprouting yet no seedlings seen yet one seedhead open seen (AGR91100603);

**Confusing Species:** None noted, but problems with *P. scorzoneriifolia* were anticipated.

However, it is only usually noticed when in flower, greatly facilitating identification. When flower- or seedheads not present its mimicry to restios is remarkable and it is only noticed in cuttings and denuded areas. Records of identification queries = 5.

**Variation and Taxonomy:** None recorded or noted.

**Distribution:** Add.

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# *Protea cryophila* Bolus 1909

## Snowball Protea

### *Sneeublom*

**Other Common Names:** Giant-snowball Protea, Snow Protea, Snow-flower Sugarbush, *Sneeubal*, *Sneeuprotea*, *Sneesusikerkan*.

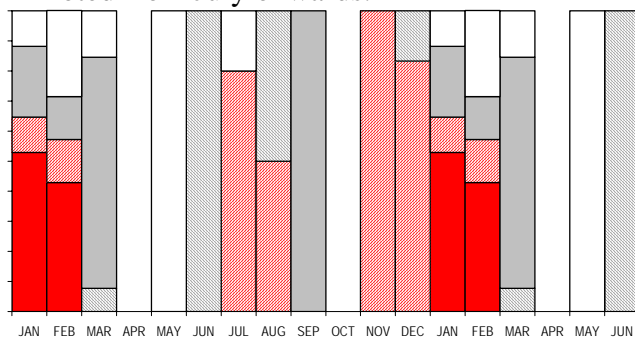
**Other Scientific Names:** *chionantha* Bolus 1906.

#### 58 Records

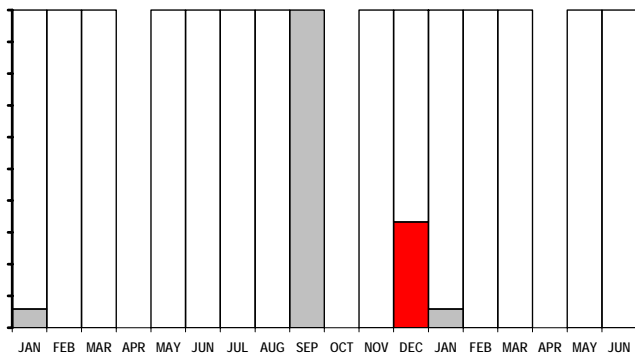
**Population** (57 records): 11% Common, 56% Frequent, 32% Rare, 2% Extinct.

**Dispersion** (46 records): 63% variable, 20% clumped, 13% evenly distributed, 4% widespread.

**Flowering** (57 records with: Jan 17, Feb 7, Mar 13, Apr 0, May 3, Jun 2, Jul 5, Aug 2, Sep 1, Oct 0, Nov 1, Dec 6): Buds from Jul to Aug and Nov to Dec; Flowering from Jan to Feb; Peak Flowering not recorded; Over from Jun and Aug; Fruit from Jan, Mar and Sep; Nothing from Feb, May and Jul. Peak levels at 65% in Jan. Historically recorded as flowering from Jan to Mar, even Apr, peaking in Feb. Although buds are reputed to take 12 months to form flowerheads, this was not detected, with flowerheads only noted from July onwards.



**Growth** (53 records with: Jan 17, Feb 4, Mar 13, Apr 0, May 3, Jun 2, Jul 5, Aug 1, Sep 1, Oct 0, Nov 1, Dec 6): Much from Dec; Rare from Sep; None from all year round. Peak levels unreliable at 33% in Dec.



**Seedlings** (27 records): Absent in 85%; more seedlings than prefire adults in 2 cases. Seedlings found in Mar (2).

**Fire Survival** (6 records): 67% survived by seedlings only, 33% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 5 years (no data from younger veld), 50% estimated at 4 years, and 100% recorded at 7 years.



**Height** (56 records): 29% 0-0.2 m tall, 70% 0.2-1 m tall, 2% 1-2 m tall.

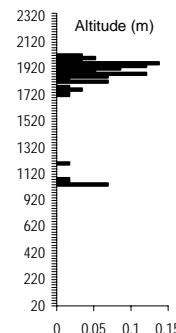
**Pollinators** (2 records): 50% mammals, 50% beetles.

**Detailed Pollinators:** No additional data.

#### Habitat:

**Distance to Ocean** (57 records): 100% inland - further than 2 km from coast.

**Altitude** (57 records): 920 - 1920 m; 1700 *lq* - 1780 *med* - 1820 *uq*m.



**Landform** (54 records): 54% shallow soil, 24% rocky outcrops, 22% deep soil.

**Slope** (57 records): 42% steep incline, 26% gentle incline, 12% hill top, 12% platform, 4% cliff, 4% valley bottom.

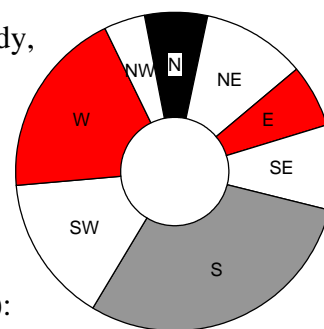
**Aspect** (46 records): 39% South, 30% West, 17% East, 13% North.

**Soil Type** (54 records): 50% rocky, 41% sandy, 6% gravelly, 4% loamy.

**Soil Colour** (54 records): 70% grey, 24% brown, 6% white.

**Geology** (56 records): 93% sandstone, 7% shale.

**Vegetation** (54 records): 98% shrubland, 2% grassland.



#### Conservation Status and Threat:

**Red Data List Status:** Near Threatened D2(i,ii).

**Occurrence (Fynbos):** 79 km<sup>2</sup> with 89% conserved and 3% lost; **Occupancy:** 43 km<sup>2</sup> with 99% conserved and 0% lost. **Fragmentation index:** 48%.

**Nature Reserves** (57 records): 100% in nature reserves - well conserved.

**Habitat destruction** (54 records): 98% extensive natural habitat, 2% naturally linear habitats.

**Alien Invasive Species** (51 records): 98% none, 2% *Pinus*.

**Alien Density** (51 records): 98% alien-free, 2% sparse.

**Cultivation & Utilization:**

**Picking** (29 records): 100% no sign of picking.

**Cultivation Status:** Plantings - 1 record (2%).

**Witch's Broom Infestation:** 1 record (2%).

**Atlassers Notes:**

**Flowering:**

No adults plants with flowers this year - all last years cones (NAH99021301); Last year (1992) it had in excess of 30 flowerheads this year there were only 4 (NGW93081301); From the whole Langberg / Shadow Peak area many had flowered last year but had no buds or flowers this year - climate? (WIJ99013008); Less than 10% of plants were in flower or bud - a few were in cone from previous years (WIJY0012903);

**Regeneration:**

Some seedlings (single stem) some destroyed by fire with no resprouting (WIJ95020412);

**The well known Welbedacht plant:**

Is a planted specimen 2m in diameter near graveyard (formerly in wire cage) (AKS94091305); One (1.5x1.5m in size) fenced in and covered over with wire netting

(JAT92080103); Lots of dead leaves in middle of plant (LYM96021001); Although we discussed this single plant with a local who lived at Welbedacht he had no idea whether it had been planted there or not (NGW93081301);

**Mortality:**

Only 1 dead plant seen (AGR99032806);

Almost 1/2 plants dead! (AGR99032810);

**Population sizes:**

Over 50 plants counted, many of them very small (JAT97012502); Counted 10 plants (JIDY0012903); About 30 young plants (<5 years) (NAH99021301); 200 or 300 plants growing on N and S slopes (WIJ98031211);

**Confusing Species:** None noted.

Records of identification queries = 1.

**Variation and Taxonomy:** None recorded or noted other than that the insides of the involucre bracts vary from dull ivory to deep pink in colour.

**Distribution:** Add.

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## *Protea pruinosa* Rourke 1977 Frosted Sugarbush

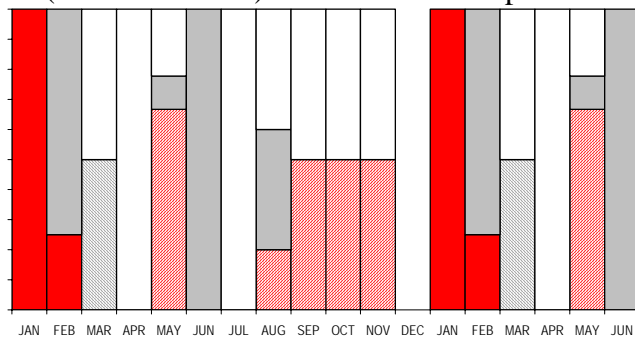
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

### 39 Records

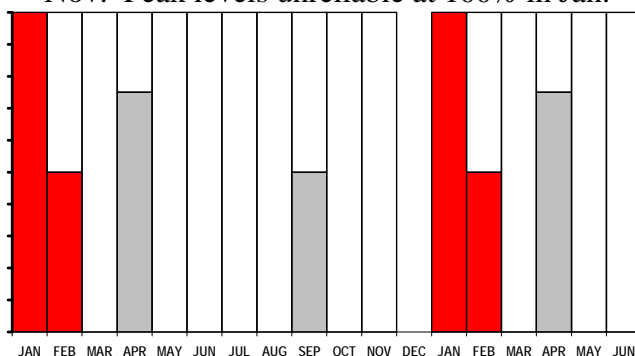
**Population** (39 records): 5% Common, 56% Frequent, 38% Rare.

**Dispersion** (33 records): 52% variable, 42% clumped, 6% evenly distributed.

**Flowering** (36 records with: Jan 1, Feb 4, Mar 2, Apr 1, May 9, Jun 1, Jul 1, Aug 5, Sep 2, Oct 8, Nov 2, Dec 0): Buds from May and Aug to Nov; Flowering from Jan to Feb; Peak Flowering not recorded; Over from Mar; Fruit from Feb, Jun and Aug; Nothing from Mar to May and Jul to Nov. Peak levels unreliable at 100% in Jan. Historically recorded as flowering from Jan to Feb, with a few in Mar. Data support the long period (over 10 months) for buds to develop.



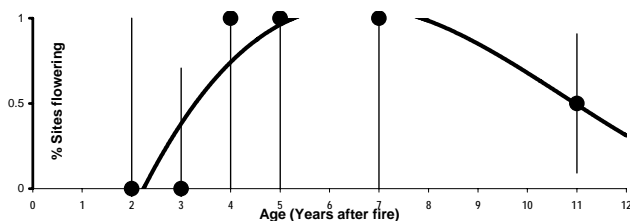
**Growth** (37 records with: Jan 1, Feb 4, Mar 1, Apr 4, May 9, Jun 1, Jul 1, Aug 5, Sep 2, Oct 7, Nov 2, Dec 0): Much from Jan to Feb; Rare from Apr and Sep; None from Feb to Nov. Peak levels unreliable at 100% in Jan.



**Seedlings** (12 records): Absent in 67%: fewer seedlings than prefire adults in 1 case, and more in 1 case. Seedlings found in Apr and Oct.

**Fire Survival** (4 records): 75% survived by seedlings only, 25% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 4 years, 50% estimated at 4 years, and 100% recorded at 4 years.



**Height** (39 records): 77% 0-0.2 m tall, 23% 0.2-1 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

### Habitat:

**Distance to Ocean** (38 records):

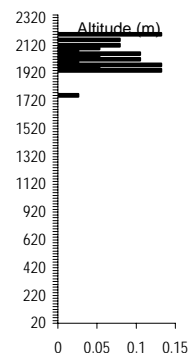
100% inland - further than 2 km from coast.

**Altitude** (38 records): 1640 - 2100 m; 1860<sub>lq</sub> - 1920<sub>med</sub> - 1940<sub>uq</sub> m.

**Landform** (38 records): 58% shallow soil, 39% deep soil, 3% rocky outcrops.

**Slope** (38 records): 45% steep incline, 37% gentle incline, 18% hill top.

**Aspect** (31 records): 42% South, 37% East, 16% North, 5% West.



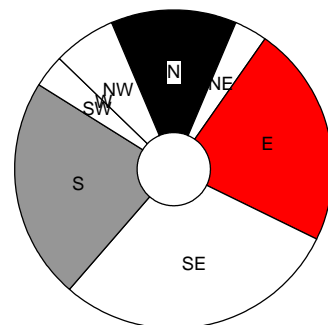
**Soil Type** (38 records):

50% sandy, 29% loamy, 18% rocky, 3% gravelly.

**Soil Colour** (38 records): 50% brown, 37% grey, 11% black, 3% yellow.

**Geology** (38 records): 97% sandstone, 3% shale.

**Vegetation** (37 records): 97% shrubland, 3% grassland.



### Conservation Status and Threat:

**Red Data List Status:** Endangered

B1a(i,ii)b(v)+2a(i,ii)b(v).

**Occurrence (Fynbos):** 368 km<sup>2</sup> with 50% conserved and 1% lost; **Occupancy:** 26 km<sup>2</sup> with 90% conserved and 0% lost.

**Fragmentation index:** 6%.

**Nature Reserves** (38 records): 97% in nature reserves - well conserved.

**Habitat destruction** (36 records):

100% extensive natural habitat.

**Alien Invasive Species** (34 records):

100% none.

**Alien Density** (34 records): 100% alien-free.

### Cultivation & Utilization:

**Picking** (27 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlasers Notes:**

We did not see the plants that were shown to us last time, but saw three fire survivors and lots of young plants (AWA99052001); Plenty of young but an alarming number dead/dying! Unlike the previous plot at sh1924 m where all the plants seem healthy (AWA99052002); About 10% dead presumably from drought (NAHY1060302); About 10 dead plants seen - but also 30% of this small population consists of young plants (NAHY5111801);

**Confusing Species:** None noted.  
Records of identification queries = 1.

**Variation and Taxonomy:** None noted.

**Distribution:** Add.

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*Protea scabriuscula* Phill. 1910  
**Hoary Sugarbush**

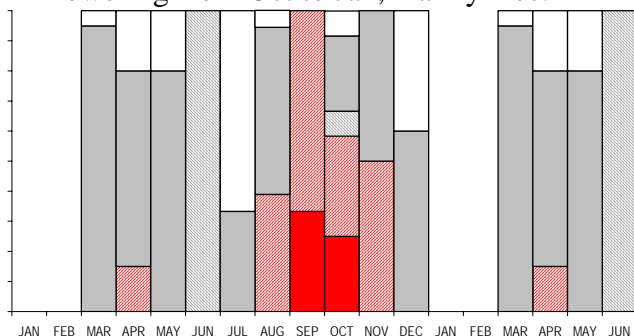
**Other Common Names:** None known.  
**Other Scientific Names:** *montana* Schl.

**93 Records**

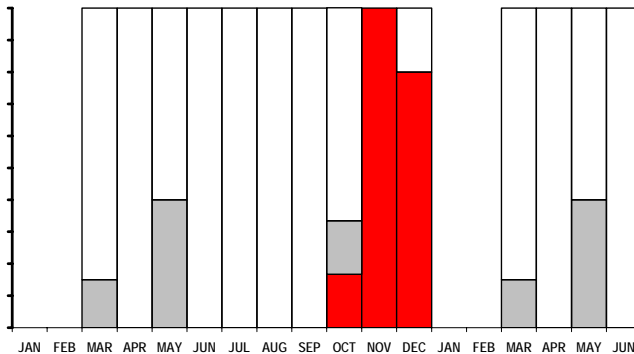
**Population** (93 records): 13% Common, 55% Frequent, 32% Rare.

**Dispersion** (80 records): 74% variable, 26% clumped.

**Flowering** (92 records with: Jan 0, Feb 0, Mar 20, Apr 20, May 5, Jun 1, Jul 3, Aug 18, Sep 6, Oct 12, Nov 2, Dec 5): Buds from Aug to Nov; Flowering from Sep to Oct; Peak Flowering not recorded; Over from Jun; Fruit from Mar to Aug and Oct to Dec; Nothing from Apr to Jul and Dec. Peak levels at 100% in Sep. Historically recorded as flowering from Oct to Jan, mainly Dec.



**Growth** (92 records with: Jan 0, Feb 0, Mar 20, Apr 20, May 5, Jun 1, Jul 3, Aug 18, Sep 6, Oct 12, Nov 2, Dec 5): Much from Nov to Dec; Rare from May; None from Dec to Oct. Peak levels unreliable at 100% in Nov.



**Seedlings** (18 records): Absent in 89%; fewer seedlings than prefire adults in 1 case. Seedlings found in Jun.

**Fire Survival** (6 records): 100% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 2 years, and 100% recorded at 2 years.



**Height** (92 records): 78% 0-0.2 m tall, 22% 0.2-1 m tall.

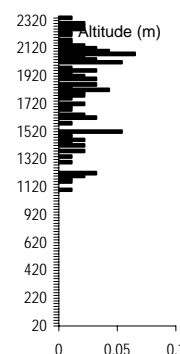
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (93 records): 100% inland - further than 2 km from coast.

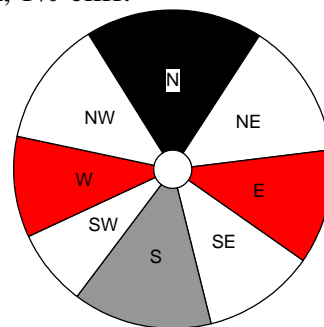
**Altitude** (93 records): 980 - 2260 m; 1400 *lq* - 1720 *med* - 1920 *uq*m.



**Landform** (92 records): 51% deep soil, 48% shallow soil, 1% rocky outcrops.

**Slope** (92 records): 55% steep incline, 34% gentle incline, 4% hill top, 3% platform, 2% valley bottom, 1% cliff.

**Aspect** (78 records): 31% North, 25% East, 23% South, 21% West.



**Soil Type** (91 records): 41% sandy, 25% rocky, 14% loamy, 14% gravelly, 5% clayey.

**Soil Colour** (89 records): 49% grey, 29% brown, 8% white, 8% orange, 3% yellow, 2% black.

**Geology** (91 records): 66% sandstone, 34% shale.

**Vegetation** (92 records): 95% shrubland, 5% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 1 563 km<sup>2</sup> with 3% conserved and 14% lost; **Occupancy:** 103 km<sup>2</sup> with 18% conserved and 5% lost. **Fragmentation index:** 5%.

**Nature Reserves** (93 records): 19% in nature reserves - inadequately conserved.

**Habitat destruction** (91 records): 95% extensive natural habitat, 4% naturally linear habitats, 1% islands.

**Alien Invasive Species** (90 records): 91% none, 9% *Pinus*.

**Alien Density** (90 records): 91% alien-free, 9% sparse.

**Cultivation & Utilization:**

**Picking** (54 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (1%).

**Atlassers Notes:** None.

**Confusing Species:** Easily confused with *P. scolopendriifolia* (75% of corrected queries): the non-sprouting habit is not easy to see as the plant branches very close to the ground and accumulates soil around the stems. Also confused with *P. piscina*, but this is a

resprouter with a much narrower, scabrous leaf.

Records of identification queries = 12.

Records of corrected identification queries = 4.

**Variation and Taxonomy:** None noted.

**Distribution:** Add.

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*Protea scolopendriifolia* (Salisb. ex Kn.) Rourke 1809, 1974  
**Hart's-tongue-fern Sugarbush**

**Other Common Names:** Hearts-tongue-leaf  
 Erodendrum, *Tongblaarsuikerkan*.

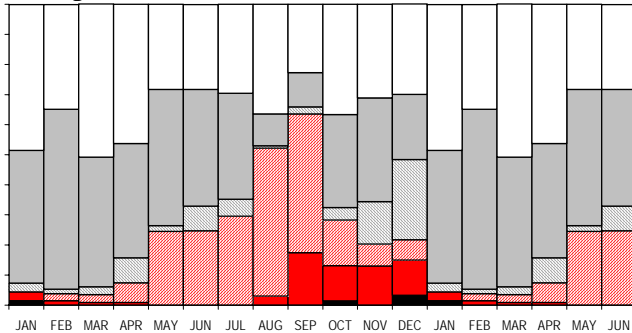
**Other Scientific Names:** *scolopendrina* St  
 Lager 1880, *scolopendrium* RBr 1810.

**1284 Records**

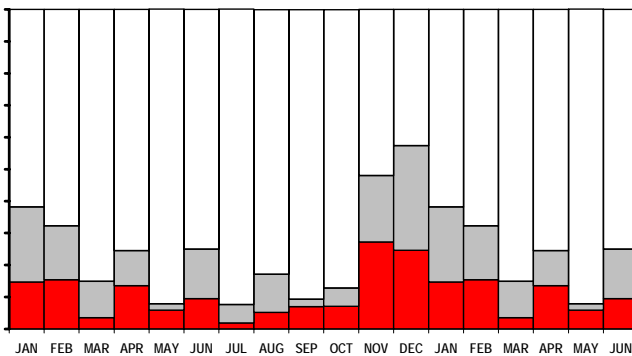
**Population** (1275 records): 16% Common,  
 54% Frequent, 28% Rare.

**Dispersion** (1110 records): 63% variable,  
 29% clumped, 6% widespread, 2% evenly  
 distributed.

**Flowering** (1262 records with: Jan 68, Feb 132,  
 Mar 116, Apr 108, May 53, Jun 85, Jul 54,  
 Aug 132, Sep 132, Oct 145, Nov 177, Dec  
 60): Buds from May to Sep; Flowering and  
 Peak Flowering not significant – peaking in  
 Sep to Dec at between 10 and 20%; Over  
 from Dec; Fruit from Oct to Jul; Nothing  
 from all year round. Peak levels at 66% in  
 Sep. Historically recorded as flowering from  
 Sep to Dec.



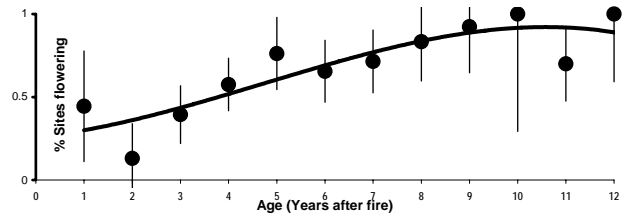
**Growth** (1246 records with: Jan 68, Feb 130,  
 Mar 114, Apr 110, May 51, Jun 84, Jul 53,  
 Aug 134, Sep 128, Oct 140, Nov 173, Dec  
 61): Much from Nov to Dec; Rare from Nov  
 to Jan; None from all year round. Peak levels  
 at 57% in Dec.



**Seedlings** (430 records): Absent in 93%: fewer  
 seedlings than prefire adults in 14 cases, and  
 more in 2 cases. Seedlings found in Mar (2),  
 Aug (7), Oct (3) and Nov (4).

**Fire Survival** (117 records): 95% resprouted  
 from underground boles, 3% escaped fires in  
 fire-safe areas, 2% eliminated from the area  
 by fires.

**Age to first flowering:** First flowers recorded  
 at 1 year, 50% estimated at 3-4 years, and  
 100% recorded at 10 years, but peak levels  
 typically range from 67-100% after 7 years.



**Height** (1270 records): 76% 0-0.2 m tall,  
 24% 0.2-1 m tall.

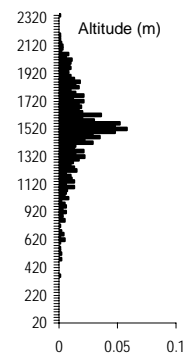
**Pollinators** (4 records): 50% mammals,  
 25% bees or wasps, 25% other pollinators.

**Detailed Pollinators** (1 record): Wasp  
 (unspecified).

**Habitat:**

**Distance to Ocean** (1262  
 records): 100% inland -  
 further than 2 km from  
 coast.

**Altitude** (1262 records): 340 -  
 2240 m; 1240 *lq* - 1420 *med* -  
 1520 *uq*m.

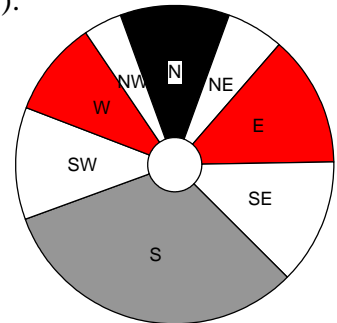


**Landform** (1260 records):  
 58% deep soil, 38% shallow  
 soil, 4% rocky outcrops.

**Slope** (1258 records): 45% steep  
 incline, 39% gentle incline,  
 9% hill top, 5% platform, 1% cliff,  
 1% valley bottom.

**Aspect** (1103 records):

44% South,  
 22% East,  
 18% West,  
 16% North.



**Soil Type** (1254  
 records):

40% sandy,  
 28% loamy,  
 16% gravelly,  
 11% rocky,  
 4% clayey.

**Soil Colour** (1250 records): 51% brown,  
 36% grey, 4% black, 4% orange, 2% white,  
 2% yellow.

**Geology** (1228 records): 77% sandstone,  
 21% shale, 2% granite.

**Vegetation** (1255 records): 98% shrubland,  
 2% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 17 595 km<sup>2</sup> with 26%  
 conserved and 9% lost; Occupancy:  
 1 392 km<sup>2</sup> with 42% conserved and 2% lost.  
 Fragmentation index: 3%.

**Nature Reserves** (1262 records): 51% in nature  
 reserves - well conserved.

**Habitat destruction** (1227 records):  
 95% extensive natural habitat, 3% naturally  
 linear habitats, 1% islands.

**Alien Invasive Species** (1211 records):  
 85% none, 11% *Pinus*, 3% *Hakea*.

**Alien Density** (1211 records): 85% alien-free, 14% sparse, 1% abundant.

**Cultivation & Utilization:**

**Picking** (798 records): 100% no sign of picking.

**Cultivation Status:** Escapes - 1 record (0.08%).

**Witch's Broom Infestation:** 1 record (0.08%).

**Atlassers Notes:**

Had yellow flowers - not like in book (AWA96101502); Inflorescences have little or no pink pigment (SHR94090403);

Broad leaf but very hummocky in growth habit (AGRY1022203);

Good recruitment - lots of young (AGR97051807);

Only dead plants seen (AGR99080707); 1/2 plants dead (AGR99092609); One dead plant seen (AGRY0112314); Some (ca 5%) dead (AGRY0112518); Look sick (AWAY0050302); Is dead (DOA97022703); 2/5 dead (GEDY0112309); 30% of all plants dead or dying some releasing seed apparently due to drought (NAH94040203); About 80% dead, presumably from drought (NAHY1060302); More than one half of the plants were dead (NGFY0081604); 2 plants dead (SAS98080802); One dead plant seen (SAS99092405); Many dead - drought related (WIJY0112607);

Pollinator a Masuarid? Wasp (AGRY4110605); Rodent chewing and scats and ants (AGRY4110701); Pollinated (?) by

cockroach (AMMY3100811); Ants on single flowerhead seen (DJL98100207); Ants were burrowing into the flowers (LYM99092405); All the leaves eaten off a few cm above ground! we have never seen similar before (AWA99101007); Mouse was eating seeds (DEB94080701); Seeds dispersing as new buds nearly ready to open (PMR99060501);

**Confusing Species:** Confused variously with *P. acaulos* (43% of corrected queries; which has hairless, smooth, spoon-shaped leaves), and once each with *P. convexa*, *caespitosa*, and *vogtsiae* (none have the narrow involucre bracts) and *P. scabriuscula* (which does not normally resprout).

Records of identification queries = 30.

Records of corrected identification queries = 7.

**Variation and Taxonomy:** "Enormously" variable in leaves, inflorescence size and habit. Forms with more compact habit, larger leaves and flowerheads tend to occur in wetter regions. The largest forms are found in the Groot Winterhoek. In arid areas the involucre bracts tend to have a more dense wool.

**Distribution:** Add.

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*Protea aspera* Phill. 1910  
**Rough-leaf Sugarbush**

**Other Common Names:** Snowball, Aardroos, Sneeuwal.

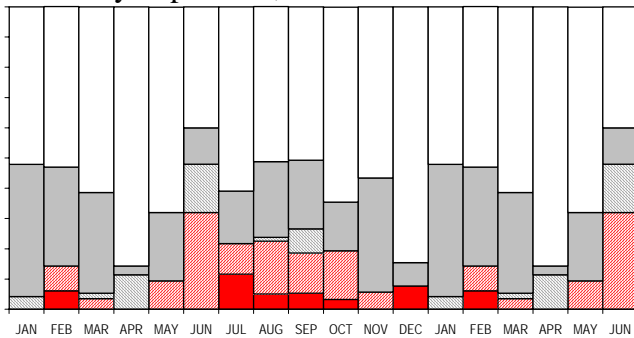
**Other Scientific Names:** *None*.

**674 Records**

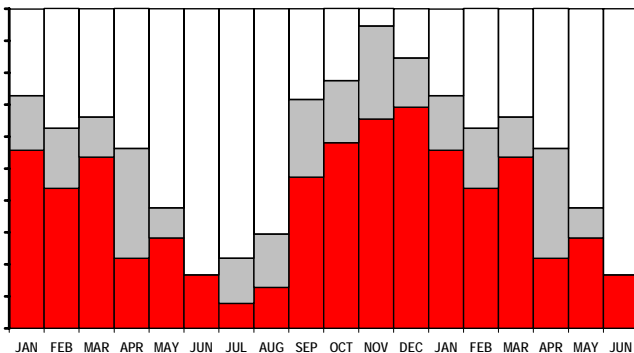
**Population** (665 records): 14% Common, 59% Frequent, 26% Rare.

**Dispersion** (529 records): 76% variable, 21% clumped, 2% widespread, 0.8% evenly distributed.

**Flowering** (611 records with: Jan 71, Feb 49, Mar 57, Apr 35, May 53, Jun 25, Jul 69, Aug 80, Sep 75, Oct 31, Nov 53, Dec 13): Buds from Jun; Flowering not significant peaking in Jul; Peak Flowering not recorded; Over from Jun; Fruit from Jan to Mar, May, Aug to Sep and Nov; Nothing from all year round, peaking in Apr. Peak levels at 48% in Jun. Historically recorded as flowering from chiefly Sep to Oct, but to Dec.



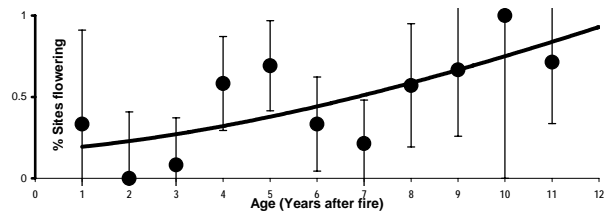
**Growth** (598 records with: Jan 70, Feb 48, Mar 56, Apr 32, May 53, Jun 24, Jul 64, Aug 78, Sep 74, Oct 31, Nov 55, Dec 13): Much from Sep to May; Rare from Apr and Sep to Nov; None from Jan to Oct. Peak levels at 95% in Nov.



**Seedlings** (264 records): Absent in 95%; fewer seedlings than prefire adults in 3 cases, and more in 4 cases. Seedlings found in Jan (4), Jul (2) and Oct.

**Fire Survival** (57 records): 100% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-7 years, and 100% recorded at 10 years, with senescence after 10 years.



**Height** (612 records): 87% 0-0.2 m tall, 13% 0.2-1 m tall.

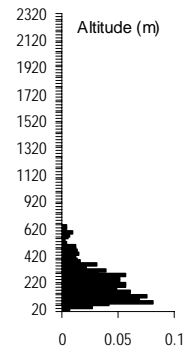
**Pollinators** (1 record): 100% mammals.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (667 records): 99% inland - further than 2 km from coast.

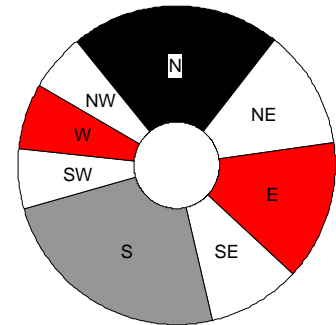
**Altitude** (667 records): 20 - 920 m; 100<sub>lq</sub> - 180<sub>med</sub> - 260<sub>uq</sub>m.



**Landform** (607 records): 86% deep soil, 11% shallow soil, 2% rocky outcrops.

**Slope** (605 records): 63% gentle incline, 15% steep incline, 12% platform, 9% hill top, 1% valley bottom.

**Aspect** (499 records): 32% South, 30% North, 25% East, 12% West.



**Soil Type** (605 records): 61% sandy, 27% loamy, 5% gravelly, 5% clayey.

**Soil Colour** (600 records): 53% grey, 33% brown, 7% white, 3% black, 2% yellow, 2% orange.

**Geology** (630 records): 72% sandstone, 13% shale, 12% silcrete or ferricrete, 2% Tertiary sands, 1% limestone.

**Vegetation** (660 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable A2c. Occurrence (Fynbos): 4 291 km<sup>2</sup> with 16% conserved and 29% lost; Occupancy: 628 km<sup>2</sup> with 8% conserved and 30% lost. Fragmentation index: 6%.

**Nature Reserves** (667 records): 20% in nature reserves.

**Habitat destruction** (590 records): 90% extensive natural habitat, 8% islands, 1% road verges.

**Alien Invasive Species** (589 records): 31% Fabaceae (chiefly alien *Acacia*), 27% none, 23% *Pinus*, 13% *Hakea*, 6% Myrtaceae.

**Alien Density** (587 records): 27% alien-free, 54% sparse, 16% abundant, 3% dense.

**Cultivation & Utilization:**

**Picking** (437 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (0.1%).

**Atlassers Notes:**

Found One Plant With A New Bud, Just Over Ten in flower (AWA97081406); A Few Dried Flowerheads (CVV95043002); One Flower and 1 Bud Found (LYM98101502); Rodent Damage Seen On Flowerheads (LYMY0081605); Seem To Only Occur - Recent Burn Areas! (AJT95043007); Lots Of Die Back (OUT99060511);

Pr Scabra Present But Also Narrower Longer Leaved Patches With Short Stems - If Not Pr Aspera - Then Half Way There! (AGR96052207); Very Broad Leaf! (AGRY3111211);

**Confusing Species:** Mostly confused with *P. scabra*, and less often in the Langeberg with *P. piscina*, which when in flower or fruit

have small (flowers less than 50 mm long), not large heads. Often though populations without flowerheads are encountered, when broad-leaf forms may easily be confused, but the short, emergent green stems appears to be a good character. An intermediate population seems to occur on Babylonstoring. A single case of misidentification with *P. laevis* was recorded, but this has smooth, not sandpapary leaves.

Records of identification queries = 48.

Records of corrected identification queries = 28.

**Variation and Taxonomy:** Although most involucre bracts are rusty brown, paler brown forms do occur, but are not noteworthy.

**Distribution:** Add.

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*Protea denticulata* Rourke 1974  
**Tooth-leaf Sugarbush**  
*Tandjies*

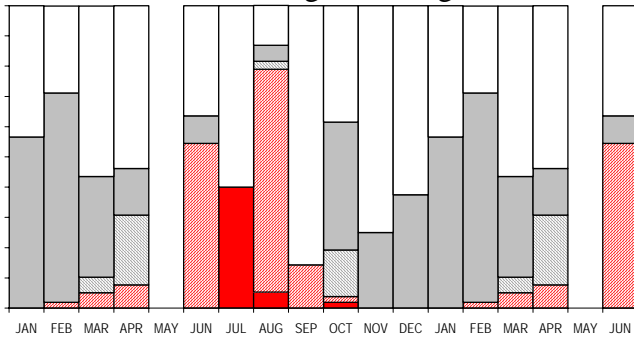
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**301 Records**

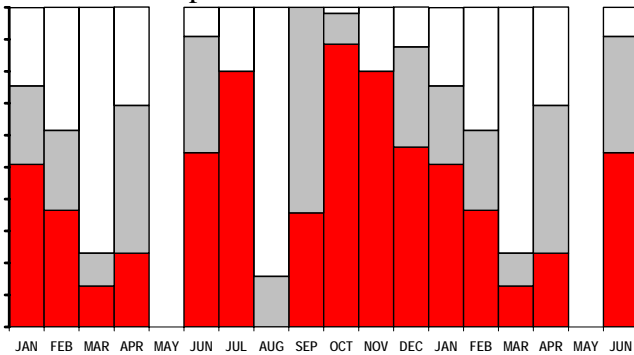
**Population** (301 records): 27% Common, 55% Frequent, 18% Rare.

**Dispersion** (276 records): 81% variable, 15% clumped, 3% widespread, 1% evenly distributed.

**Flowering** (297 records with: Jan 53, Feb 52, Mar 39, Apr 13, May 0, Jun 11, Jul 5, Aug 38, Sep 14, Oct 52, Nov 4, Dec 16): Buds from Jun and Aug; Flowering from Jul; Peak flowering not recorded; Over from Apr; Fruit from Oct to Mar; Nothing from Sep to Jul. Peak levels at 81% in Aug. Historically recorded as flowering from Aug to Oct.



**Growth** (298 records with: Jan 53, Feb 52, Mar 39, Apr 13, May 0, Jun 11, Jul 5, Aug 38, Sep 14, Oct 52, Nov 5, Dec 16): Much from Sep to Feb and Apr to Jul; Rare from Dec to Feb, Apr to Jun and Sep; None from Jan to Apr and Jul to Aug and Nov. Peak levels at 100% in Sep.



**Seedlings** (157 records): Absent in 96%: fewer seedlings than prefire adults in 2 cases, and more in 1 case. Seedlings found in Jun, Jul and Sep.

**Fire Survival** (8 records): 63% resprouted from underground boles, 25% escaped fires in fire-safe areas, 13% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4-7 years, and 100% recorded consistently at 8 years.



**Height** (294 records): 55% 0-0.2 m tall, 45% 0.2-1 m tall, 0.3% 1-2 m tall.

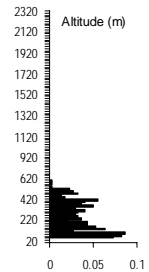
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (301 records): 96% inland - further than 2 km from coast.

**Altitude** (301 records): 40 - 600 m; 100<sub>lq</sub> - 220<sub>med</sub> - 360<sub>uq</sub>m.



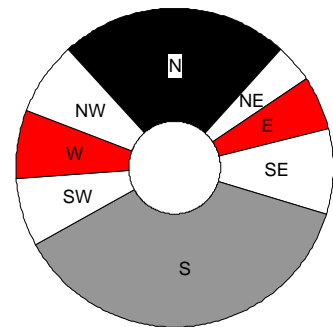
**Landform** (299 records):

73% deep soil, 20% shallow soil, 6% rocky outcrops.

**Slope** (300 records): 44% gentle incline, 31% steep incline, 18% platform, 5% hill top, 1% valley bottom.

**Aspect** (256 records):

46% South, 30% North, 13% West, 10% East.



**Soil Type** (298 records):

40% sandy, 37% loamy,

10% gravelly, 6% rocky, 6% clayey, 1% peaty.

**Soil Colour** (299 records): 60% grey, 28% brown, 5% black, 4% white, 2% yellow.

**Geology** (287 records): 77% sandstone, 10% silcrete or ferricrete, 7% shale, 5% Tertiary sands, 1% limestone.

**Vegetation** (301 records): 99% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern - Rare based on vegetation type.

**Occurrence** (Fynbos): 167 km<sup>2</sup> with 56% conserved and 8% lost; **Occupancy:** 156 km<sup>2</sup> with 61% conserved and 10% lost.

**Fragmentation index:** 88%.

**Nature Reserves** (301 records): 67% in nature reserves - well conserved.

**Habitat destruction** (295 records): 87% extensive natural habitat, 8% islands, 5% naturally linear habitats

**Alien Invasive Species** (287 records):  
44% Fabaceae (chiefly alien *Acacia*),  
39% none, 14% *Pinus*, 3% Myrtaceae.  
**Alien Density** (287 records): 39% alien-free,  
47% sparse, 9% abundant, 5% dense.

**Cultivation & Utilization:**

**Picking** (224 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 4 records (1%).

**Atlasers Notes:**

Appears to have aborted all its flowers in this population (AGR92080412);  
Of all the plants we saw only counted 12 flowerheads supposedly because plants still young (VJK99090803);

**Confusing Species:** Misidentified as *P. piscina*, but is a resprouter with erect stems. The two species do not overlap.  
Records of identification queries = 2.  
Records of corrected identification queries = 2.

**Variation and Taxonomy:** None noted.

Plants from the north slopes of Potberg, which are drier and less frequently burned, tend to be taller than those on the south slopes.

**Distribution:** Add.

INCLUDEPICTURE

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## *Protea piscina* Rourke 1978

### Visgat Sugarbush

#### *Skurweblaarsuikerbos*

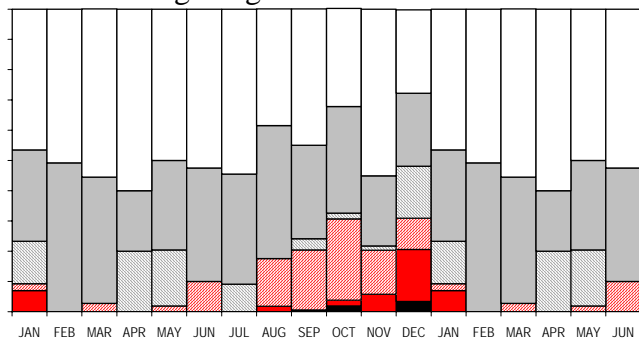
**Other Common Names:** Piketberg Protea, Tufted Sugarbush, *Skurweblaardwergprotea*.  
**Other Scientific Names:** *tenuifolia* Phill & Stapf 1912.

#### 752 Records

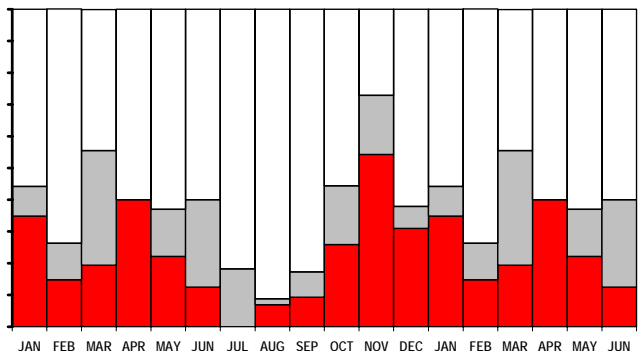
**Population** (748 records): 18% Common, 55% Frequent, 27% Rare.

**Dispersion** (648 records): 69% variable, 29% clumped, 2% widespread, 0.6% evenly distributed.

**Flowering** (744 records with: Jan 43, Feb 61, Mar 36, Apr 5, May 54, Jun 40, Jul 11, Aug 57, Sep 162, Oct 108, Nov 138, Dec 29): Buds from Sep to Oct; Flowering and Peak Flowering not significant, peaking in Dec; Over from Apr to May and Dec to Jan; Fruit from all year round; Nothing from all year round. Peak levels at 48% in Dec. Historically recorded as flowering from Nov to Jan in the Cold Bokkeveld and Jun to Sep in the Langeberg. <do 2 seasons!>



**Growth** (746 records with: Jan 43, Feb 61, Mar 36, Apr 5, May 54, Jun 40, Jul 11, Aug 57, Sep 162, Oct 108, Nov 140, Dec 29): Much from Oct to Jan and Apr to May; Rare from Mar, Jun and Oct to Nov; None from all year round. Peak levels at 73% in Nov.

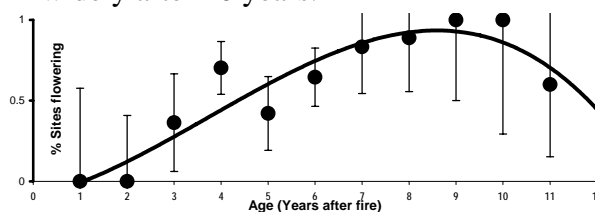


**Seedlings** (281 records): Absent in 99%; more seedlings than prefire adults in 1 case. Seedlings found in Dec.

**Fire Survival** (102 records): 98% resprouted from underground boles, 2% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 3 years, 50% estimated at 3-5 years, and

100% recorded at 9 years, but fluctuating widely after 10 years.



**Height** (746 records): 82% 0-0.2 m tall, 17% 0.2-1 m tall, 0.1% 1-2 m tall.

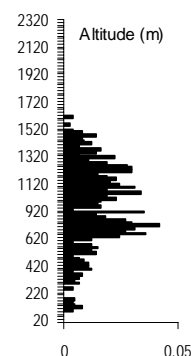
**Pollinators** (1 record): 100% mammals.

**Detailed Pollinators:** No additional data.

#### Habitat:

**Distance to Ocean** (740 records): 100% inland - further than 2 km from coast.

**Altitude** (740 records): 80 - 1760 m; 660 *lq* - 840 *med* - 1080 *uq*m.

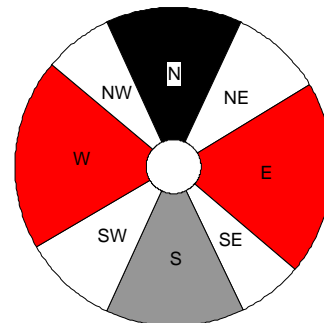


**Landform** (739 records): 68% deep soil, 28% shallow soil, 4% rocky outcrops.

**Slope** (735 records):

50% gentle incline,  
34% steep incline,  
8% hill top,  
6% platform.

**Aspect** (642 records): 28% East, 28% West, 22% North, 22% South.



**Soil Type** (738 records): 45% sandy, 22% loamy, 22% gravelly, 9% rocky, 2% clayey.

**Soil Colour** (738 records): 54% brown, 32% grey, 5% yellow, 4% white, 2% orange, 2% red.

**Geology** (730 records): 81% sandstone, 16% shale, 2% conglomerate, 2% silcrete or ferricrete.

**Vegetation** (740 records): 99% shrubland.

#### Conservation Status and Threat:

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 8 140 km<sup>2</sup> with 12% conserved and 13% lost; **Occupancy:** 765 km<sup>2</sup> with 24% conserved and 6% lost. **Fragmentation index:** 5%.

**Nature Reserves** (740 records): 40% in nature reserves.

**Habitat destruction** (729 records): 95% extensive natural habitat, 2% islands, 2% naturally linear habitats.

**Alien Invasive Species** (723 records):  
79% none, 14% *Pinus*, 4% Fabaceae (chiefly alien *Acacia*), 2% Myrtaceae, 1% *Hakea*.  
**Alien Density** (723 records): 79% alien-free, 19% sparse, 2% abundant.

**Cultivation & Utilization:**

**Picking** (527 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 2 records (0.3%).

**Atlassers Notes:**

Not many had buds (AWA97090601); Strange no buds or old flowerheads - no fire damage amongst plants? (VJK93093001);

Young plants present but not common (NAH92081511);

Broad leaves 9mm wide (WIJ98021403);

Lots of plants dead (AGRY0111114);

There was a distinct path to the flowerheads presumably made by rodents (VJK94091809);

On edge of ridge below plateau these species seem to require a bit more water and occur around a seepage zone (AGR91122901);

Only at crest of ridge (AGR91122903); In rocky - bouldery areas (AGR92123006);

**Confusing Species:** Variously misidentified, usually when not in flower, with *P. restionifolia* (leaves narrower and hairy), *P. revoluta* (leaves smooth and folded, although some instances of nearly smooth leaves in *P. piscina* were noted), *P. scabra* (with much broader leaves), *P. lorea* (with much longer, smooth, needle-like leaves), *P. scorzoneriifolia* (leaves less sinuous, more tightly rolled and almost needle-like). When in flower the small, yellow flowerheads are distinctive.

Records of identification queries = 29

Records of corrected identification queries = 11.

**Variation and Taxonomy:** Usually with yellow involucre bracts, but pinkish forms are sometimes encountered.

**Distribution:** Add.

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*Protea restionifolia* (Salisb. ex Kn.) Rycr. 1809, 1962  
**Reed-leaf Sugarbush**

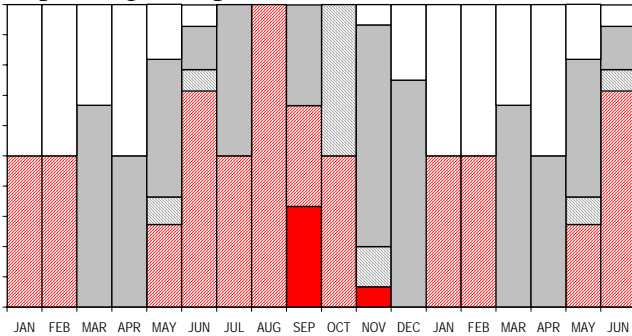
**Other Common Names:** Grass-leaf Sugarbush, Restio-leaf Erodendrum, Restio-leaf Sugarbush, *Bruingronprotea*.  
**Other Scientific Names:** *echinulata* Meisn 1856.

**68 Records**

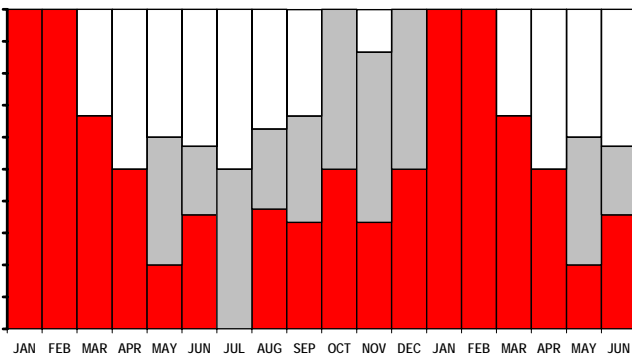
**Population** (67 records): 10% Common, 42% Frequent, 48% Rare.

**Dispersion** (57 records): 51% clumped, 47% variable, 2% widespread.

**Flowering** (68 records with: Jan 2, Feb 2, Mar 3, Apr 2, May 11, Jun 14, Jul 2, Aug 8, Sep 3, Oct 2, Nov 15, Dec 4): Buds from Jan to Feb, and May to Oct; Flowering from Sep; Peak Flowering not recorded; Over from Oct; Fruit from Mar to May, Jul and Sep to Dec; Nothing from Dec to Apr. Peak levels unreliable at 100% in Aug. Historically recorded as flowering from Aug to Oct, peaking in Sep.



**Growth** (67 records with: Jan 2, Feb 2, Mar 3, Apr 2, May 10, Jun 14, Jul 2, Aug 8, Sep 3, Oct 2, Nov 15, Dec 4): Much from Aug to Jun; Rare from May to Dec; None from Mar to Sep. Peak levels at 100% from Dec to Feb.



**Seedlings** (24 records): All without any seedlings present.

**Fire Survival** (3 records): 67% escaped fires in fire-safe areas, 33% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 3 years, 50% estimated at 2 years, and 100% recorded at 3 years, with a hint of senescence after 20 years.



**Height** (68 records): 78% 0-0.2 m tall, 22% 0.2-1 m tall.

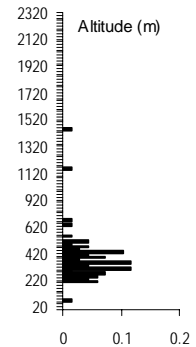
**Pollinators** (1 record): 100% mammals.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (68 records): 100% inland - further than 2 km from coast.

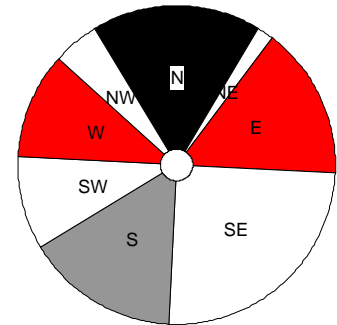
**Altitude** (68 records): 60 - 1360 m; 280 *lq* - 360 *med* - 400 *uq*m.



**Landform** (68 records): 74% deep soil, 22% shallow soil, 4% rocky outcrops.

**Slope** (68 records): 51% steep incline, 38% gentle incline, 4% cliff, 4% hill top, 1% platform.

**Aspect** (64 records): 34% South, 27% East, 20% North, 19% West.



**Soil Type** (68 records): 50% loamy, 22% sandy, 15% gravelly, 9% clayey, 4% rocky.

**Soil Colour** (68 records): 53% brown, 22% grey, 18% orange, 4% red, 3% yellow.

**Geology** (57 records): 54% shale, 46% sandstone.

**Vegetation** (67 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable A2c, B1a(i,ii)b(i,ii,iii,iv,v)+2a(i,ii)b(i,ii,iii,iv,v).

**Occurrence** (Fynbos): 943 km<sup>2</sup> with 28% conserved and 15% lost; **Occupancy:** 103 km<sup>2</sup> with 9% conserved and 25% lost. **Fragmentation index:** 6%.

**Nature Reserves** (68 records): 1% in nature reserves - unconserved.

**Habitat destruction** (67 records): 90% extensive natural habitat, 4% islands, 4% naturally linear habitats, 1% corridors.

**Alien Invasive Species** (67 records): 40% *Hakea*, 31% none, 18% *Pinus*,

7% Fabaceae (chiefly alien *Acacia*),  
3% Myrtaceae.

**Alien Density** (67 records): 31% alien-free,  
64% sparse, 3% abundant, 1% dense.

**Cultivation & Utilization:**

**Picking** (56 records): 100% no sign of picking.  
**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

The population was destroyed by the quarry works -and are only on the verge near an electricity pylon. The colony was in the small spot for years - it was more sandy there than elsewhere (LIN92100701);  
The plants were in a clay band at this sandstone site (PVR93092405);

**Confusing Species:** None noted, the thin densely haired leaves being quite distinctive.  
Records of identification queries = 1.

**Variation and Taxonomy:** Occasionally forms with pinkish to carmine styles and inner involucre bracts, which are usually yellowish cream. Plants south of Villiersdorp tend to have larger heads (60-70mm long), whereas those in the Breede River Valley are smaller (30-40mm long) (figures corrected from Rourke 1980).

**Distribution:** Add.

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*Protea scabra* R.Br. 1810  
**Sandpaper-leaf Sugarbush**  
*Skurweblaargrondsuikerbos*

**Other Common Names:** Rasp-leaf Erodendrum, Scab-leaf Protea, Scabrous Sugarbush.

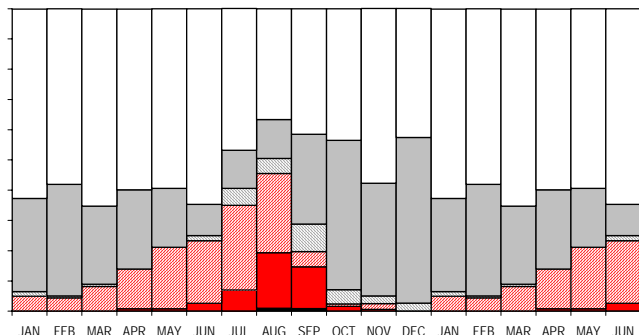
**Other Scientific Names:** *caledonensis* Guthrie 1939, *tenuifolia* RBr 1810.

**2256 Records**

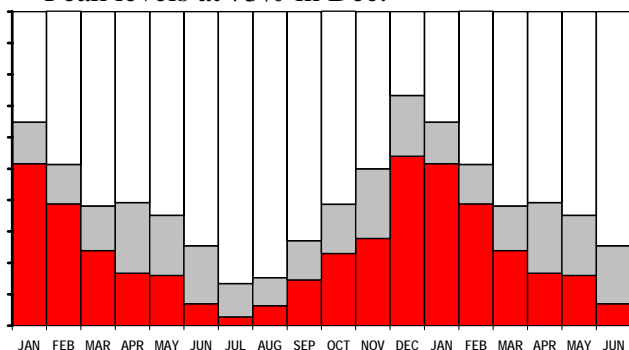
**Population** (2232 records): 20% Common, 53% Frequent, 26% Rare.

**Dispersion** (1906 records): 77% variable, 18% clumped, 5% widespread, 0.4% evenly distributed.

**Flowering** (2229 records with: Jan 182, Feb 160, Mar 267, Apr 122, May 133, Jun 116, Jul 143, Aug 202, Sep 340, Oct 253, Nov 161, Dec 150): Buds from May to Aug; Flowering not significant peaking from Aug to Sep; Peak Flowering and Over not significant; Fruit from Sep to May; Nothing from all year round. Peak levels at 51% in Aug. Historically recorded as flowering erratically from Apr to Oct, mainly Jul to Oct.



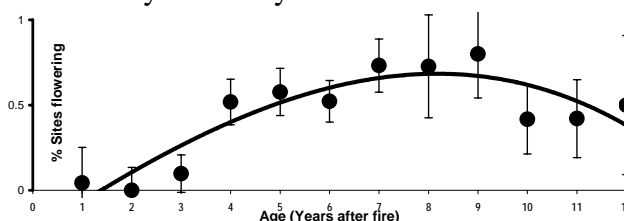
**Growth** (2203 records with: Jan 182, Feb 160, Mar 268, Apr 120, May 131, Jun 114, Jul 142, Aug 202, Sep 328, Oct 244, Nov 162, Dec 150): Much from Oct to Mar; Rare from Apr and Nov; None from all year round. Peak levels at 73% in Dec.



**Seedlings** (942 records): Absent in 99%: fewer seedlings than prefire adults in 4 cases, and more in 1 case. Seedlings found in Jan, May, Jul and Dec (2).

**Fire Survival** (180 records): 97% resprouted from underground boles, 2% survived by seedlings only, 1% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded at 15 years, declining markedly after 17 years.



**Height** (2242 records): 86% 0-0.2 m tall, 14% 0.2-1 m tall.

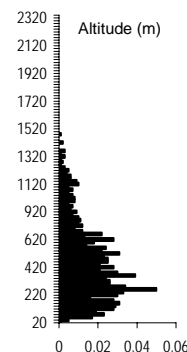
**Pollinators** (5 records): 40% mammals, 40% beetles, 20% flies.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (2207 records): 85% inland - further than 2 km from coast.

**Altitude** (2207 records): 20 - 1500 m; 220<sub>lq</sub> - 380<sub>med</sub> - 560<sub>uq</sub>m.



**Landform** (2197 records): 81% deep soil, 16% shallow soil, 3% rocky outcrops, 0.1% swamp, 0.1% riverine.

**Slope** (2199 records): 54% gentle incline, 37% steep incline, 5% hill top, 4% platform, 0.5% cliff, 0.3% valley bottom.

**Aspect** (2045 records): 38% South, 23% North, 21% West, 17% East.

**Soil Type** (2190 records):

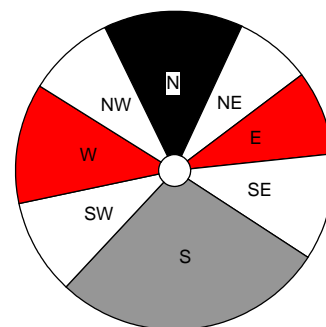
48% sandy, 27% loamy, 11% gravelly, 10% clayey, 4% rocky, 1% peaty.

**Soil Colour** (2183 records):

52% grey, 35% brown, 5% orange, 3% black, 3% white, 1% yellow.

**Geology** (2143 records): 74% sandstone, 22% shale, 2% silcrete or ferricrete, 1% granite.

**Vegetation** (2196 records): 98% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened A2c+4c.

**Occurrence** (Fynbos): 4 167 km<sup>2</sup> with 32% conserved and 25% lost; **Occupancy:** 1 366 km<sup>2</sup> with 28% conserved and 21% lost. **Fragmentation index:** 19%.

**Nature Reserves** (2207 records): 40% in nature reserves.

**Habitat destruction** (2180 records): 94% extensive natural habitat, 5% islands, 1% naturally linear habitats,.

**Alien Invasive Species** (2160 records): 39% *Pinus*, 29% none, 19% *Hakea*, 11% Fabaceae (chiefly alien *Acacia*), 2% Myrtaceae.

**Alien Density** (2155 records): 29% alien-free, 57% sparse, 10% abundant, 3% dense.

**Cultivation & Utilization:**

**Picking** (1572 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (0.04%).

**Atlassers Notes:**

**Flowering**

Only one plant in bud (AKS93090201); Only very old seedheads (AWA95031301); One plant with flower (AWA95091901); Some with buds (AWA99041403); Occasional buds (CVV96070902); 2 old flowerheads (GYC93100104); A couple of dried buds seen but no old flowerheads since fire (GYC98101701); Approx 5% were in flower (HCE96070904+5); No buds seen on hillside – only buds seen in sheltered donga (KENY0090502);

**Survival**

Fire seems to have passed over these low plants which were damaged in some cases (TLE99122706);

**Variation**

*Protea scabra* and *aspera* seen in same plot - quite distinct: latter narrow leaved, former very broad (AGRY0052405); Boundary here between *P. aspera* and *scabra* should be investigated (AMMY3111106)

Has very broad leaves - suspect hybrid with *P. magnifica* far wider than on slopes below cliff (SHR91092109)

Broad leaf form (AGR91092101 SMR91092109);

Very thin leaved form - taken as *P. aspera* until a flowerhead turned up later and confirmed

ID (SMRY2090601); A narrow leaf (WIJ92121610);

Some variation in leaf size between various plants 240mm long + 8mm vs wide 240mm long + 24mm wide (WEL94050102);

**New growth**

Veld covered with *P. scabra* new growth (AWA95031401);

**Browsing**

Grazed (AGR96081502); Grazed down (FWV96080702); Some grazed (LYM99040803); Grazed by sheep (NAH97060201); Young leaves browsed: only 1-2cm left (SMRY0060205);

**Mortality**

All dead (AGRY1101907); 1 dead (AGRY3102815);

Deep ripped - killed! (ASP92092208);

**Distribution**

In a little shaley spot (AGR99120814);

Occurring at the join of the flats and the hill slope (CJL98061601); Hugs a band at about 100m (CJL98061604); In a definite band at about 80 M (CJL98061605); Only found on a very small section of shale rather than the dominant sandstone (NGF97011803);

Burnt area on west side of firebreak covered in young plants/seedlings (AWA95031403);

**Confusing Species:** Quite distinct with broad leaves and small, brown flowerhead, but confused when not in flower or seed with *P. aspera* (short (100mm-long) leafy stems), *angustata* (with erect stems and smooth leaves), *scorzoneriifolia* (with longer, rolled leaves) and *scolopendriifolia* (with a long petiolar region).

Records of identification queries = 31.

Records of corrected identification queries = 9.

**Variation and Taxonomy:** Leaves may vary from 2-25mm wide, but in most populations are 10-20mm wide.

**Distribution:** Add.

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*Protea scorzonerifolia* (Salisb. ex Kn.) Rycr. 1809, 1961  
**Channel-leaf Sugarbush**

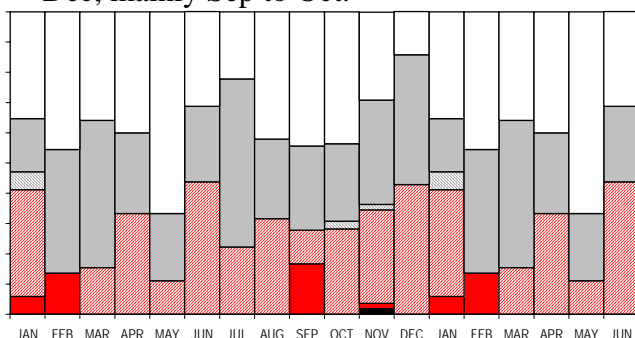
**Other Common Names:** Scorzonera-leaf Erodendrum.  
**Other Scientific Names:** *repens* (L)L-Thunb 1781.

**266 Records**

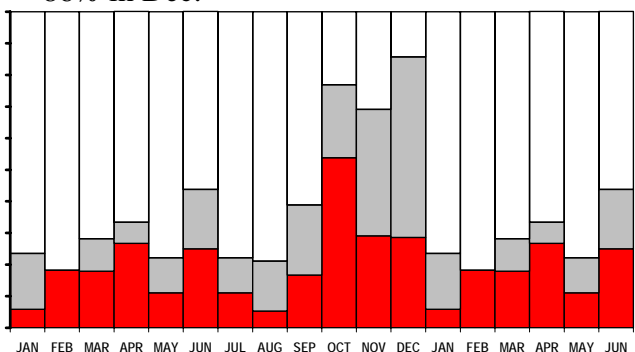
**Population** (266 records): 12% Common, 55% Frequent, 34% Rare.

**Dispersion** (220 records): 77% variable, 22% clumped, 0.9% evenly distributed.

**Flowering** (265 records with: Jan 17, Feb 22, Mar 39, Apr 15, May 9, Jun 16, Jul 9, Aug 19, Sep 18, Oct 39, Nov 55, Dec 7): Buds from Oct to Jan, Apr and Jun to Aug; Flowering, Peak Flowering and Over not significant, from Sep to Feb; Fruit from Feb to Dec; Nothing from all year round. Peak levels at 47% in Jan. Historically recorded as flowering from erratically from Aug to Dec, mainly Sep to Oct.



**Growth** (265 records with: Jan 17, Feb 22, Mar 39, Apr 15, May 9, Jun 16, Jul 9, Aug 19, Sep 18, Oct 39, Nov 55, Dec 7): Much from Apr, Jun and Oct to Dec; Rare from Sep to Dec; None from Jan to Nov. Peak levels at 86% in Dec.



**Seedlings** (138 records): Absent in 96%: fewer seedlings than prefire adults in 1 case, and more in 2 cases. Seedlings found in Jul and Nov (2).

**Fire Survival** (54 records): 100% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 5 years.



**Height** (265 records): 64% 0-0.2 m tall, 36% 0.2-1 m tall.

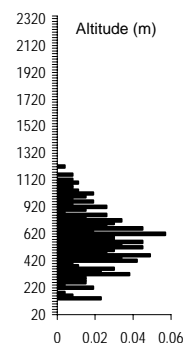
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (265 records): 100% inland - further than 2 km from coast.

**Altitude** (265 records): 120 - 1120 m; 400<sub>lq</sub> - 540<sub>med</sub> - 660<sub>uq</sub>m.

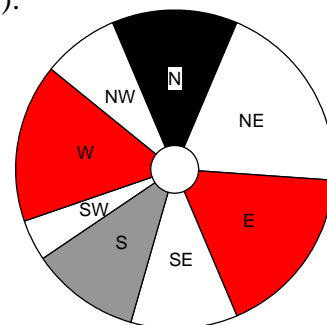


**Landform** (263 records): 76% deep soil, 23% shallow soil, 2% rocky outcrops.

**Slope** (264 records): 53% gentle incline, 33% steep incline, 8% platform, 5% hill top, 1% valley bottom.

**Aspect** (242 records):

33% East,  
 25% North,  
 22% West,  
 20% South.



**Soil Type** (263 records):

36% loamy,  
 33% sandy,  
 19% gravelly,  
 10% rocky,  
 3% clayey.

**Soil Colour** (261 records): 64% brown, 24% grey, 8% orange, 3% white, 1% yellow.

**Geology** (260 records): 56% sandstone, 20% shale, 18% granite, 3% silcrete or ferricrete, 2% conglomerate.

**Vegetation** (265 records): 97% shrubland, 2% plantations.

**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable A2c.

Occurrence (Fynbos): 2 407 km<sup>2</sup> with 33% conserved and 31% lost; Occupancy: 312 km<sup>2</sup> with 19% conserved and 23% lost. Fragmentation index: 9%.

**Nature Reserves** (265 records): 21% in nature reserves.

**Habitat destruction** (263 records): 95% extensive natural habitat, 3% islands, 1% naturally linear habitats.

**Alien Invasive Species** (263 records): 41% *Hakea*, 25% *Pinus*, 23% none, 10% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (261 records): 23% alien-free, 53% sparse, 20% abundant, 3% dense.

**Cultivation & Utilization:**

**Picking** (214 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (0.4%).

**Atlassers Notes:**

One plant had a flower (LYM97112607);

1 bud seen - eaten by moth? larva

(AGR95112625);

Eaten (CHE98052106); Signs of grazing

(LYM97081305); Heavily grazed probably

by cows (NGF96051602);

Most dead! (drought?) (AGRY0101903);

**Confusing Species:** A distinctive species, especially when in flower with the large flowerheads and long channeled leaves. Has been misidentified when not in flower as *P.*

*scabra* (with broad leaves), *P. piscina* (with an open-channeled, sinuous leaf), *P. laevis* (with a broad, flat leaf) and – presumably a transcription error - with *P. neriifolia*.

Records of identification queries = 7.

Records of corrected identification queries = 4.

**Variation and Taxonomy:** Involucral bracts creamy yellow, but pinkish forms sometimes seen. The small-leaf form (dealt with separately below) is not recorded in the literature.

**Distribution:** Add.

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## *Protea scorzonerifolia* Dwarf form

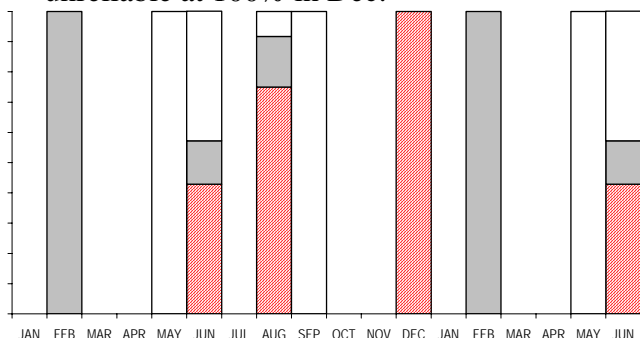
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

### 29 Records

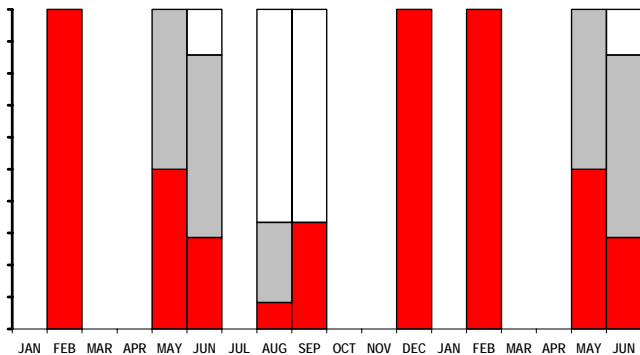
**Population** (28 records): 21% Common, 46% Frequent, 32% Rare.

**Dispersion** (25 records): 76% variable, 12% widespread, 12% clumped.

**Flowering** (28 records with: Jan 0, Feb 1, Mar 0, Apr 0, May 4, Jun 7, Jul 0, Aug 12, Sep 3, Oct 0, Nov 0, Dec 1): Buds from Jun, Aug and Dec; Flowering Peak Flowering and Over not recorded; Fruit from Feb; Nothing from May to Jun and Sep. Peak levels unreliable at 100% in Dec.



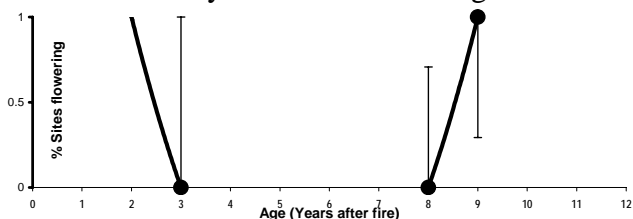
**Growth** (28 records with: Jan 0, Feb 1, Mar 0, Apr 0, May 4, Jun 7, Jul 0, Aug 12, Sep 3, Oct 0, Nov 0, Dec 1): Much from Sep to Jun; Rare from May to Aug; None from Aug to Sep. Peak levels unreliable at 100% from Dec to Feb.



**Seedlings** (10 records): All without any seedlings present.

**Fire Survival** (4 records): 100% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 100% at 9 years but data lacking.



**Height** (28 records): 93% 0-0.2 m tall, 7% 0.2-1 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

### Habitat:

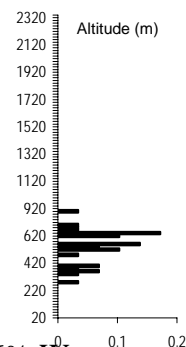
**Distance to Ocean** (29 records): 100% inland - further than 2 km from coast.

**Altitude** (29 records): 260 - 800 m; 460<sub>lq</sub> - 560<sub>med</sub> - 560<sub>uq</sub>m.

**Landform** (28 records): 79% deep soil, 21% shallow soil.

**Slope** (29 records): 34% steep incline, 34% gentle incline, 21% hill top, 10% platform.

**Aspect** (23 records): 43% East, 26% West, 17% North, 13% South.

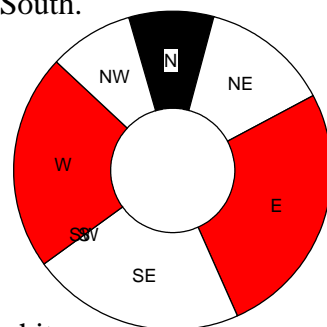


**Soil Type** (28 records): 46% gravelly, 36% sandy, 11% clayey, 7% loamy.

**Soil Colour** (27 records): 56% brown, 22% grey, 15% orange, 7% white.

**Geology** (29 records): 90% sandstone, 7% shale, 3% silcrete or ferricrete.

**Vegetation** (29 records): 100% shrubland.



### Conservation Status and Threat:

**Red Data List Status:** Near Threatened D2(i).  
**Occurrence (Fynbos):** 60 km<sup>2</sup> with 19% conserved and 18% lost; **Occupancy:** 32 km<sup>2</sup> with 36% conserved and 6% lost.  
**Fragmentation index:** 27%.

**Nature Reserves** (29 records): 48% in nature reserves.

**Habitat destruction** (29 records): 100% extensive natural habitat.

**Alien Invasive Species** (27 records): 44% none, 37% *Pinus*, 15% *Hakea*, 4% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (27 records): 44% alien-free, 56% sparse.

### Cultivation & Utilization:

**Picking** (25 records): 100% no sign of picking.  
**Cultivation Status:** No noted cultivation.

**Atlassers Notes:** None.

**Confusing Species:** First identified as *P. piscina* from non-flowering material, but seedheads and flowerheads subsequently found and too large – typically *P. scorzonerifolia*.

Records of identification queries = 13.

Records of corrected identification queries = 13.

**Variation and Taxonomy:** see PAN 27.

**Distribution:** Add.

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*Protea burchellii* Stapf 1912  
**Burchell's Sugarbush**  
*Blinksuikerbos*

**Other Common Names:** Gleaming Sugarbush, Neat Erodendrum, Petite Protea, Sugar Sugarbush, *Kleinsuikerbos*, *Suikerbos*, *Waboom*.

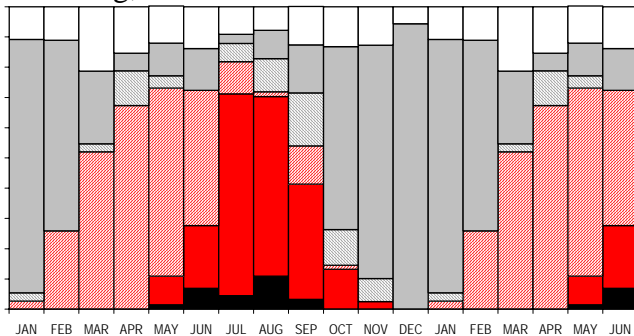
**Other Scientific Names:** *pulchella* Andr 1802, *pulchra* Rycroft 1961, *subpulchella* Stapf 1925.

**698 Records**

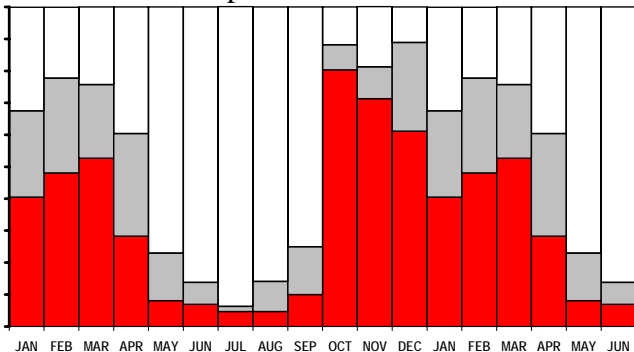
**Population** (627 records): 23% Common, 50% Frequent, 26% Rare.

**Dispersion** (537 records): 72% variable, 23% clumped, 3% widespread, 1% evenly distributed.

**Flowering** (687 records with: Jan 37, Feb 54, Mar 75, Apr 52, May 74, Jun 29, Jul 66, Aug 64, Sep 63, Oct 76, Nov 79, Dec 18): Buds from Feb to Jun; Flowering from Jun to Sep; Peak Flowering and Over not significant; Fruit from Oct to Mar; Nothing from Mar. Peak levels at 88% in Jul. Historically recorded as flowering from midwinter – Jun to Aug, with a main flush in Jun-Jul.



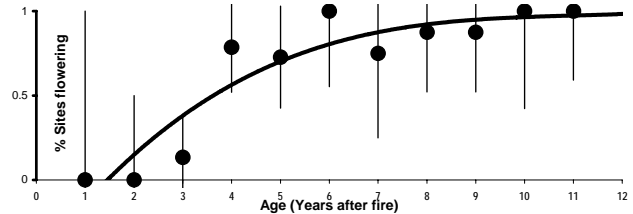
**Growth** (683 records with: Jan 37, Feb 54, Mar 74, Apr 53, May 74, Jun 29, Jul 64, Aug 64, Sep 60, Oct 76, Nov 80, Dec 18): Much from Oct to Apr; Rare from Dec to Apr; None from Jan to Sep. Peak levels at 89% in Dec.



**Seedlings** (302 records): Absent in 95%; fewer seedlings than prefire adults in 3 cases, and more in 5 cases. Seedlings found in May, Jun, Aug (3), Oct and Nov (2).

**Fire Survival** (26 records): 92% survived by seedlings only, 4% eliminated from the area by fires, 4% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 3 years, 50% estimated at 3-4 years, and 100% recorded consistently at 10 years.



**Height** (688 records): 2% 0-0.2 m tall, 50% 0.2-1 m tall, 45% 1-2 m tall, 2% 2-5 m tall, 0.1% taller than 5 m.

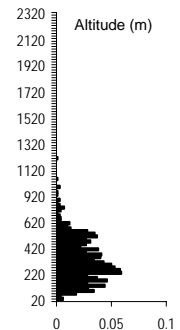
**Pollinators** (25 records): 48% bees or wasps, 32% birds, 12% beetles, 4% flies, 4% mites.

**Detailed Pollinators** (16 records): Cape Sugarbird (7), Honey Bee (6), Scarab Beetle, Malachite Sunbird, Great Protea Beetle.

**Habitat:**

**Distance to Ocean** (617 records): 100% inland - further than 2 km from coast.

**Altitude** (617 records): 40 - 1120 m; 180 *lq* - 300 *med* - 400 *uq*m.



**Landform** (617 records): 93% deep soil, 6% shallow soil.

**Slope** (616 records): 59% gentle incline, 19% platform, 16% steep incline, 3% hill top, 2% valley bottom.

**Aspect** (525 records): 38% West, 23% South, 21% East, 18% North.

**Soil Type** (611 records): 43% sandy, 35% loamy, 12% clayey, 8% gravelly, 2% rocky.

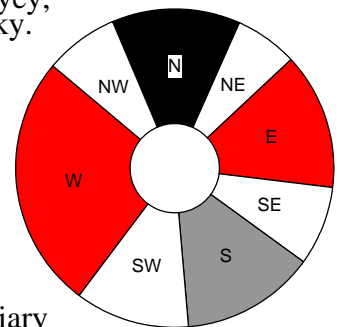
**Soil Colour** (609 records):

55% brown, 19% grey, 13% orange, 6% white, 5% yellow, 1% red.

**Geology** (570 records):

35% granite, 27% sandstone, 16% shale, 14% Tertiary sands, 5% conglomerate, 2% silcrete or ferricrete.

**Vegetation** (614 records): 94% shrubland, 4% plantations, 1% thicket.



**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable A2c+3c. Occurrence (Fynbos): 4 913 km<sup>2</sup> with 23% conserved and 40% lost; Occupancy: 692 km<sup>2</sup> with 16% conserved and 40% lost. Fragmentation index: 7%.

**Nature Reserves** (617 records): 30% in nature reserves.

**Habitat destruction** (579 records):  
78% extensive natural habitat, 18% islands,  
2% naturally linear habitats, 1% road verges,  
1% naturally fragmented habitats.

**Alien Invasive Species** (597 records):  
39% Fabaceae (chiefly alien *Acacia*),  
30% *Pinus*, 17% none, 10% *Hakea*,  
3% Myrtaceae.

**Alien Density** (597 records): 17% alien-free,  
53% sparse, 25% abundant, 5% dense.

**Cultivation & Utilization:**

**Picking** (511 records): 99% no sign of picking,  
1% lightly picked, 0.2% severely picked.

**Cultivation Status:** Plantings - 52 records  
(7%), Augmentations - 1 record (0.1%),  
Escapes - 11 records (2%).

**Witch's Broom Infestation:** 8 records (1%).

**Atlassers Notes:**

**Browsing**

Most plants very heavily grazed - 1/3 size of  
ungrazed plants and not flowering  
(AGRY0072706); Heavily grazed  
(GEH95051708); Grazed (LYM96090505,  
SMR96090506) Grazed probably by cows  
(NGF96051603); Much browsed  
(SMR98051405);

**Mortality**

Lots of dead senescent plants in patches of very  
old veld (>15 years) (AGRY4102705);  
New growth was severely blemished possibly  
affected by fallout from fire at sulfur dump?  
(LYM96030703);

**Variation**

Beautiful gun metal silver leaves - spectacular  
leaf colour form – used to rehabilitate this  
quarry: where did it come from?  
(AGRY4061201);

**Plantings**

Assume was planted (NGF94080701); The  
mother of the current farm owner is thought  
to have planted (NGF97021204); Some  
planted in gravel pit area at end of road  
(WIJ98121603)

**Population size**

Only a single plant seen - definitely! but  
nothing anywhere else (AGRY4031009);

**Mortality**

3 dead plants found (LYM97051405); All dead  
(VCH99091707); Many dead also  
(SMR96110703);

**Damage**

Baboons picking heads - numerous broken  
heads lying all over the place - broken open  
(WEL94080601);

Picking was old (SMR97022006);

**Distribution**

Almost absent from road verge  
(AGR91092901); Only in dune slacks with  
feet in water (AGRY0072717); Sand with a  
red tint - said to be associated with pr burch  
(APE93060512);

Naturalized plants restricted to clayey soils  
above granite suboutcrop exposed in roadcut  
on upslope side of road - The population is  
separate from that on the road between Kloof  
Nek and lower Cableway Station (also on  
granite) (SHR93071101);

**Confusing Species:** Mostly confused with *P.*  
*nerifolia* (which has more of a beard and  
hairy involucre bracts and bigger  
flowerheads). Hybrids with *P. laurifolia*  
especially caused many identification  
problems. Single instances of nonflowering  
plants misidentified as *P. caespitosa*, *P.*  
*coronata* and *P. longifolia*.

Records of identification queries = 47.

Records of corrected identification queries = 29.

**Variation and Taxonomy:** Extremely variable  
in color forms, with involucre bracts ranging  
from pale cream to greenish, to pink and  
carmine, and beards ranging from purple-  
black to white or black. Beards may be  
prominent to almost absent. Atlassers  
sporadically recorded silver, green and grey  
leaf colours.

**Distribution:** Add.

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*Protea compacta* R.Br. 1810  
**Bot River Sugarbush**  
*Suikerkan*

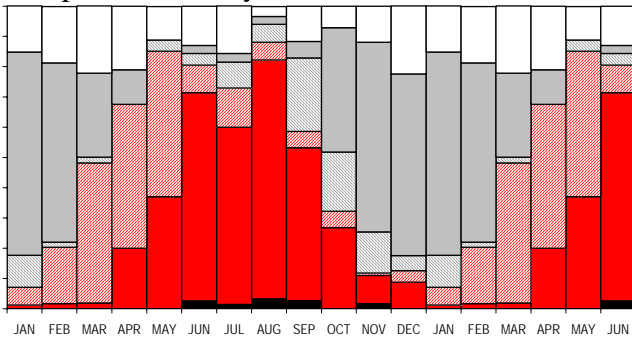
**Other Common Names:** Compacta, Handsome Erodendrum, Pink Protea, Pinkvelvet Protea, Prince Sugarbush, *Botrivierprotea*, *Botriviersuikerbos*, *Duinesuikerbos*, *Suikerbos*, *Suikerkannetjie*, *Brenda*, *Thomas*.  
**Other Scientific Names:** *coronata* Andr 1804, *formosum* (Salisb)RBr 1810, *spectabilis* Willd ex Meisn 1856, *triandra* Schltr 1900.

**1176 Records**

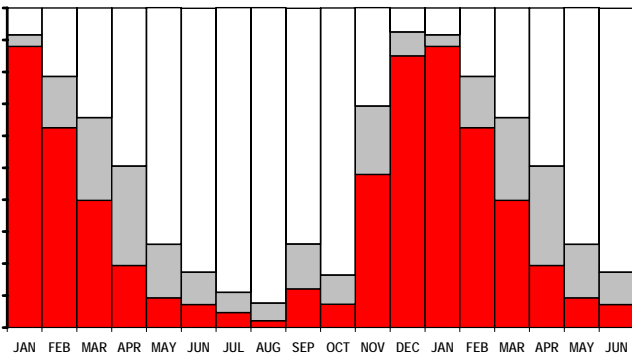
**Population** (926 records): 4% Abundant, 45% Common, 40% Frequent, 10% Rare.

**Dispersion** (806 records): 71% variable, 22% clumped, 6% widespread, 1% evenly distributed.

**Flowering** (1075 records with: Jan 85, Feb 59, Mar 108, Apr 105, May 54, Jun 77, Jul 70, Aug 152, Sep 111, Oct 56, Nov 118, Dec 80): Buds from Mar to May; Flowering from Apr to Oct; Peak Flowering not significant; Over from Sep to Oct; Fruit from Oct to Mar; Nothing from Mar to Apr and Dec 23. Peak levels at 94% in Aug. Historically recorded as flowering from Apr to Sep, with a peak from May to Jun.



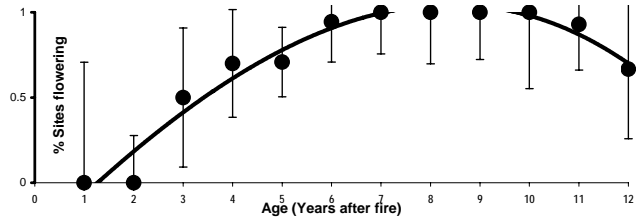
**Growth** (1042 records with: Jan 83, Feb 56, Mar 108, Apr 103, May 54, Jun 69, Jul 64, Aug 146, Sep 107, Oct 55, Nov 117, Dec 80): Much from Nov to Mar; Rare from Mar to Apr and Nov; None from Feb to Nov. Peak levels at 93% in Dec.



**Seedlings** (459 records): Absent in 88%: fewer seedlings than prefire adults in 15 cases, and more in 13 cases. Seedlings found in Jan (6), Feb (2), May (2), Jun (2), Jul (3), Aug (5), Sep (7) and Dec.

**Fire Survival** (59 records): 81% survived by seedlings only, 14% eliminated from the area by fires, 5% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% recorded at 7 years.



**Height** (1077 records): 3% 0-0.2 m tall, 22% 0.2-1 m tall, 57% 1-2 m tall, 18% 2-5 m tall.

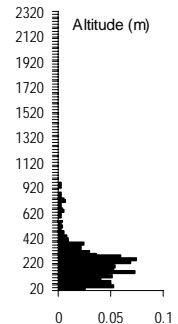
**Pollinators** (46 records): 80% birds, 13% bees or wasps, 4% mites, 2% beetles.

**Detailed Pollinators** (39 records): Cape Sugarbird (21), Orange-breasted Sunbird (9), Malachite Sunbird (3), Southern Double-collared Sunbird (2), Honey Bee (2), Wasp (unspecified), Solitary Bee.

**Habitat:**

**Distance to Ocean** (933 records): 83% inland - further than 2 km from coast.

**Altitude** (933 records): 20 - 700 m; 100<sub>lq</sub> - 180<sub>med</sub> - 240<sub>uq</sub>m.



**Landform** (853 records): 89% deep soil, 6% shallow soil, 3% rocky outcrops.

**Slope** (853 records): 64% gentle incline, 14% steep incline, 13% platform, 6% hill top, 2% valley bottom.

**Aspect** (738 records): 38% South, 25% East, 22% North, 16% West.

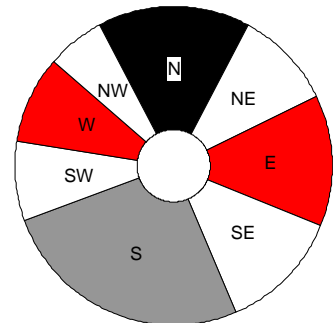
**Soil Type** (852 records): 73% sandy, 17% loamy, 4% gravelly, 4% clayey, 1% rocky.

**Soil Colour** (850 records): 57% grey, 24% brown, 11% white, 3% yellow, 2% orange, 2% black.

**Geology** (854 records): 81% sandstone, 7% shale, 5% silcrete or ferricrete, 4% Tertiary sands, 2% limestone.

**Vegetation** (922 records): 98% shrubland.

**Conservation Status and Threat:**



**Red Data List Status:** Near Threatened  
A2c+4d.

Occurrence (Fynbos): 2 476 km<sup>2</sup> with 10% conserved and 35% lost; Occupancy: 801 km<sup>2</sup> with 12% conserved and 23% lost. Fragmentation index: 23%.

**Nature Reserves** (933 records): 19% in nature reserves - inadequately conserved.

**Habitat destruction** (835 records): 88% extensive natural habitat, 7% islands, 2% road verges, 2% naturally linear habitats.

**Alien Invasive Species** (837 records): 34% Fabaceae (chiefly alien *Acacia*), 26% *Pinus*, 25% none, 7% *Hakea*, 7% Myrtaceae.

**Alien Density** (834 records): 25% alien-free, 52% sparse, 17% abundant, 6% dense.

**Cultivation & Utilization:**

**Picking** (805 records): 79% no sign of picking, 16% lightly picked, 6% severely picked.

**Cultivation Status:** Plantings - 203 records (17%), Augmentations - 36 records (3%), Escapes - 30 records (3%).

**Witch's Broom Infestation:** 42 records (4%).

**Atlassers Notes:**

**Senescence**

Tatty and very tall (PAP92082711); One dead plant seen (LYM99040809); Many dead also (SMRY0081601); Lots of very big dead plants - died shading out by pines and old age (AGR96052201); Several dead because of encroaching pines (WIJ99020702);

**Plantings**

Evidence of harvesting and perhaps planting (APE92080404); Naturally occurring population augmented by planted (DJL98021808); Escaped from adjacent planted area (DJL99092906); Planted in rows - now abandoned (NAHY5110901);

Planted (or descended from planted) proteas (SMR96080701); Some planted some may have spread from orchard (SMR96120401); Some planted some escape (SMR98120904); Broadcast not planted in lines (SMR99052011)

The owner of the property tells me none of these proteas were planted and that a white form grows further up on his farm (JAT95010502);

**Witches Broom**

On 6 plants (SMR96120402); On some plants (LYM98060603, SMR98120904, SMRY0032905); Frequent (TRUY0081603); Common (DJLY0081608); Heavily infested (PAP94111202); On nearly all the plants (SMRY0081609);

Evident - farmer confirmed physical removal (FBH96041802);

Several plants - on some plants it had killed the branch it was on (LYM96040503);

**Confusing Species:** Very distinctive and not easily confused, although when young leaves are narrower. A single case *P. coronata* may be a transcription error.

Records of identification queries = 9.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** Atlassers noted occasional white heads, which are apparently quite common at Baardscheedersbos, but rare elsewhere. Atlassers also recorded forms with small heads, but it is not recorded if these might have been hybrids.

**Distribution:** Add.

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*Protea eximia* (Salisb. ex Kn.) Four. 1809, 1932

**Broad-leaf Sugarbush**

*Breeblaarsuikerbos*

**Other Common Names:** Duchess Sugarbush, Eximia, Fine Erodendrum, Ray-flower Sugarbush, Rose-spoon Protea, Swartberg Sugarbush, *Basters*, *Waboom*, *Baron*.

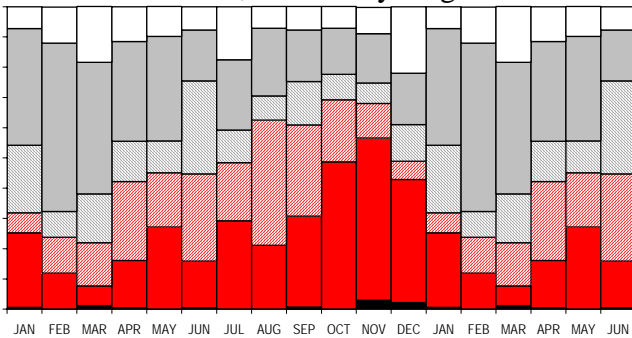
**Other Scientific Names:** *auriculata* Tausch 1842, *latifolia* RBr 1810.

**2630 Records**

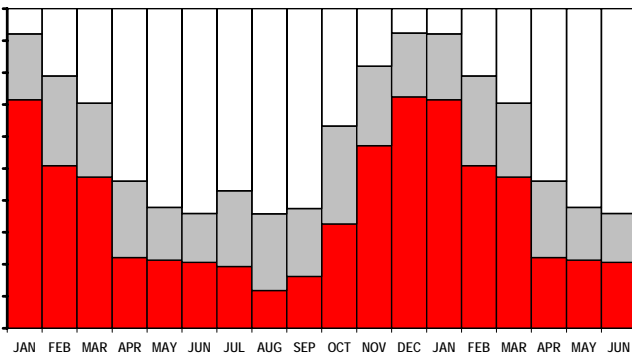
**Population** (2387 records): 1% Abundant, 24% Common, 59% Frequent, 16% Rare.

**Dispersion** (2187 records): 53% variable, 30% clumped, 13% widespread, 4% evenly distributed.

**Flowering** (2553 records with: Jan 166, Feb 176, Mar 168, Apr 218, May 162, Jun 208, Jul 120, Aug 237, Sep 306, Oct 347, Nov 263, Dec 182): Buds from Apr, Jun and Aug to Oct; Flowering from Jul to Jan and May; Peak Flowering not significant; Over from Jan and Jun; Fruit from Jan to May and Jul to Aug; Nothing from Dec. Peak levels at 78% in Oct. Historically recorded as flowering from Jul to Dec, but chiefly Aug to Oct.



**Growth** (2517 records with: Jan 165, Feb 175, Mar 169, Apr 213, May 164, Jun 209, Jul 114, Aug 229, Sep 297, Oct 340, Nov 261, Dec 181): Much from Oct to Jul; Rare from Jul to Apr; None from Feb to Oct. Peak levels at 92% in Dec.



**Seedlings** (1060 records): Absent in 91%: fewer seedlings than prefire adults in 25 cases, and more in 22 cases. Seedlings found in Jan (5), Feb (3), Mar (3), Apr, May, Jun (10), Jul (3), Aug (8), Sep (2), Oct (6), Nov (3) and Dec (2).

**Fire Survival** (111 records): 46% survived by seedlings only, 32% escaped fires in fire-safe areas, 22% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4-6 years, and 100% recorded at 10 years.



**Height** (2585 records): 2% 0-0.2 m tall, 25% 0.2-1 m tall, 61% 1-2 m tall, 13% 2-5 m tall, 0.2% taller than 5 m.

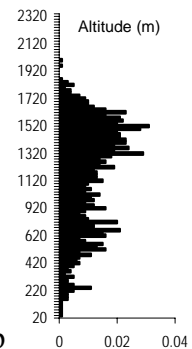
**Pollinators** (96 records): 86% birds, 9% beetles, 3% bees or wasps, 1% mites.

**Detailed Pollinators** (72 records): Cape Sugarbird (55), Orange-breasted Sunbird (12), Honey Bee (3), Amethyst Sunbird (2).

**Habitat:**

**Distance to Ocean** (2352 records): 100% inland - further than 2 km from coast.

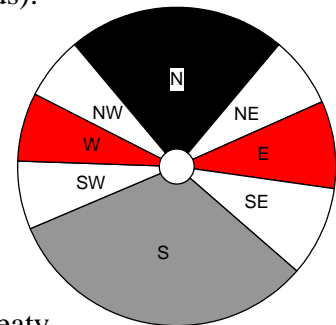
**Altitude** (2352 records): 100 - 2000 m; 800 *lq* - 1180 *med* - 1380 *uq* m.



**Landform** (2344 records): 48% deep soil, 46% shallow soil, 6% rocky outcrops.

**Slope** (2346 records): 47% gentle incline, 43% steep incline, 5% hill top, 3% platform, 1% valley bottom.

**Aspect** (2145 records): 41% South, 30% North, 16% East, 13% West.



**Soil Type** (2326 records): 47% sandy, 30% loamy, 12% rocky, 8% gravelly, 2% clayey, 1% peaty.

**Soil Colour** (2321 records): 45% grey, 41% brown, 8% black, 2% orange, 2% yellow, 1% white.

**Geology** (2326 records): 93% sandstone, 7% shale.

**Vegetation** (2342 records): 98% shrubland,.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern. Occurrence (Fynbos): 19 456 km<sup>2</sup> with 31% conserved and 12% lost; Occupancy:

2 004 km<sup>2</sup> with 53% conserved and 5% lost.  
Fragmentation index: 5%.  
**Nature Reserves** (2352 records): 61% in nature reserves - well conserved.  
**Habitat destruction** (2256 records): 94% extensive natural habitat, 2% naturally linear habitats, 2% islands.  
**Alien Invasive Species** (2193 records): 70% none, 14% *Hakea*, 14% *Pinus*, 2% Fabaceae (chiefly alien *Acacia*).  
**Alien Density** (2163 records): 71% alien-free, 23% sparse, 4% abundant, 1% dense.

#### **Cultivation & Utilization:**

**Picking** (1937 records): 99% no sign of picking, 1.0% lightly picked, 0.5% severely picked.

**Cultivation Status:** Plantings - 205 records (8%), Augmentations - 1 record (0.04%), Escapes - 27 records (1%).

**Witch's Broom Infestation:** 68 records (3%).

#### **Atlasers Notes:**

Very strong plants with very large flowerheads (OUT94110506);  
Most plants straggly with lush new growth only at tips [We call *P. eximia* Protea untidyfolia] (AWA98103102);

#### **Mortality**

Senile (HRK97051502); Plants about 4m tall but collapsed due to age and weight to about 1m height most of the plants in poor health and shape due to old age (GNIY1032904); Many dead - very old: 4 - 5 high (OUT98082202);

Dying (AGR99080703); Lot of dieback (OUT98050906); Drought stricken and poor condition (SMR99080704); Whole population looks sick (SSA92081601); Very stressed however many did have lots of new growth on the tips and some had flowers or buds - farmer reported very heavy rains in summer 1998? causing some disease + this winter has been the driest on record (WMPY0110401+2);

Etiolated and dead due to pines (AGRY0070320);

Most of plants dead! (AGR99090739); All dead - just a few plants (AGRY0070207); Only dead plants seen (AGRY0121510); Only dead skeletons seen in a clump (AGRY1112710); Many dead too (SMR99080801);

Chopped down (because alien?) (AGR99100102);

The most scruffy plants I have ever seen looks like a type of plant leprosy and mange infection: no bugs or goggas to blame so could be some atomic fall out which has burnt and dried out the leaves <Eds: cause is hail damage a few weeks earlier> (VJK98092501);

Lower leaves were dead (SMR99080701); Soil creep and many proteas are leaning over and breaking (WIJ99080805);

#### **Recruitment**

Skeletons but no seedlings or young plants (GNIY1032901);

#### **Visitors**

Dense stand with a lot of Cape Sugarbird activity (DOA93012217); Lots of Cape Sugarbirds at 11h05 (JWI98061101); Plenty of birds busy on flowers (RDF94112604); Lots of Cape Sugarbirds and beetles (RTS98110901); Lots of flowering with lots of cape sugarbirds on it (RTS98112601+2); Black ants slightly larger than Argentine Ants (OGM93010101); Many ants found in seedhead (CVD97012701);

Had a Gnaphosid Spider in the axil of a leaf below the flower head (WEL94030602);

#### **Witches Broom**

Very heavily infested (BMJ98092604, SMRY0021111); Large cancerous growths (SSA92081601); Huge broom on 2 plants (WMP99060601);

**Confusing Species:** Very distinctive with large oval leaves. Misidentified with *P. laurifolia* (quite different with elliptical leaves) and *P. grandiceps* (with green, harder leaves. Records of identification queries = 10. Records of corrected identification queries = 2.

**Variation and Taxonomy:** Swartberg and Kammanassie forms has a particularly pink blush in winter. In moister habitats green, rather than glaucous, forms predominate. Forms from Waboornsberg and Naudesberg have large inflorescences with brightly coloured bracts.

**Distribution:** Add.

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*Protea longifolia* Andrews 1803

**Long-leaf Sugarbush**

*Langblaarsuikerbos*

**Other Common Names:** Blackbeard Sugarbush, Embossed Erodendrum, Ermine-tail Sugarbush, Goatee Protea, Long-feather Erodendrum, Strap-leaf Erodendrum, *Begrafnisblom*, *Bokbaardsuikerbos*, *Donkieore*, *Swarbaartprotea*, *Wolkop*, *Candy*.

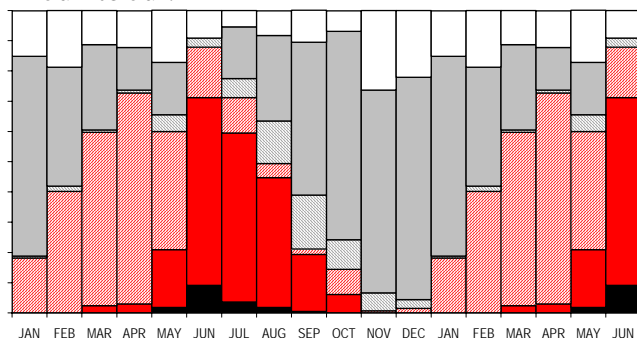
**Other Scientific Names:** *ignota* Phill 1910, *longipenne* Salisb. ex Knight 1809, *minor* (Phill)Compton 1944, *umbonalis* (Salisb. ex Knight)Sweet 1809, *vidua* Gawl <date>.

**1624 Records**

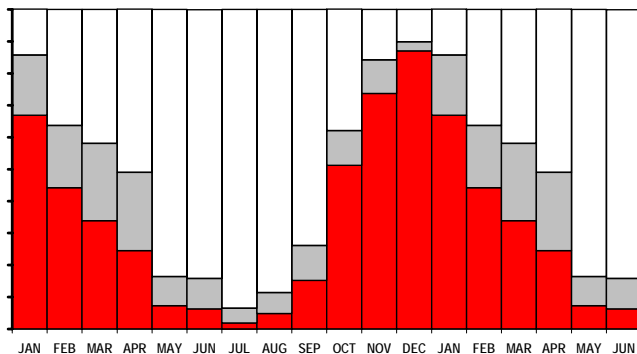
**Population** (1586 records): 30% Common, 54% Frequent, 15% Rare.

**Dispersion** (1381 records): 81% variable, 16% clumped, 3% widespread.

**Flowering** (1526 records with: Jan 159, Feb 117, Mar 124, Apr 99, May 110, Jun 66, Jul 111, Aug 170, Sep 218, Oct 132, Nov 152, Dec 68): Buds from Feb to May; Flowering from May to Sep; Peak Flowering and Ovr not significant; Fruit from Aug to Mar; Nothing from Nov and Dec. Peak levels at 91% in Jun. Historically recorded as flowering from May to Sep, but peaking in Jun to Jul.



**Growth** (1499 records with: Jan 160, Feb 113, Mar 124, Apr 94, May 110, Jun 63, Jul 108, Aug 166, Sep 211, Oct 129, Nov 152, Dec 69): Much from Oct to Apr; Rare from Jan to Apr; None from Feb to Oct. Peak levels at 90% in Dec.

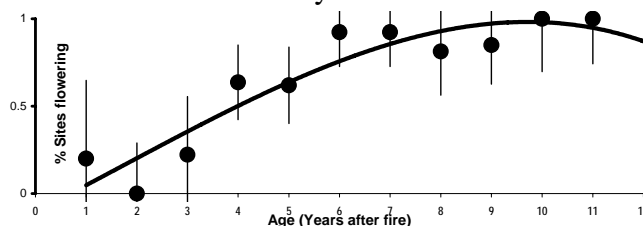


**Seedlings** (643 records): Absent in 91%; fewer seedlings than prefire adults in 13 cases, and more in 17 cases. Seedlings found in Jan

(10), Feb (2), Apr, Jun, Jul, Aug (5), Sep (4), Oct (3) and Nov (3).

**Fire Survival** (52 records): 83% survived by seedlings only, 10% eliminated from the area by fires, 4% escaped fires in fire-safe areas, 4% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 10 years.



**Height** (1524 records): 2% 0-0.2 m tall, 64% 0.2-1 m tall, 33% 1-2 m tall, 0.5% 2-5 m tall.

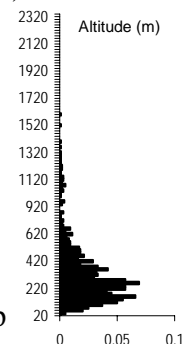
**Pollinators** (18 records): 67% birds, 17% bees or wasps, 17% beetles.

**Detailed Pollinators** (14 records): Cape Sugarbird (8), Honey Bee (2), Orange-breasted Sunbird, Monkey Beetle, Malachite Sunbird, Green Beetle.

**Habitat:**

**Distance to Ocean** (1566 records): 91% inland - further than 2 km from coast.

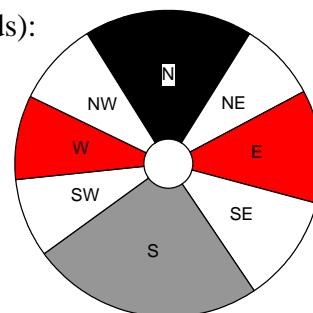
**Altitude** (1566 records): 20 - 1500 m; 140 *lq* - 240 *med* - 320 *uq* m.



**Landform** (1477 records): 88% deep soil, 9% shallow soil, 2% rocky outcrops, 0.3% riverine, 0.2% swamp.

**Slope** (1477 records): 67% gentle incline, 18% steep incline, 7% platform, 7% hill top.

**Aspect** (1335 records): 35% South, 27% North, 21% East, 17% West.



**Soil Type** (1468 records): 61% sandy, 22% loamy, 8% gravelly, 5% clayey, 2% rocky.

**Soil Colour** (1465 records): 59% grey, 26% brown, 6% white, 4% orange, 3% black, 2% yellow.

**Geology** (1477 records): 81% sandstone, 13% shale, 4% silcrete or ferricrete, 1% Tertiary sands.

**Vegetation** (1557 records): 99% shrubland.

**Conservation Status and Threat:****Red Data List Status:** Vulnerable A2c+4c.Occurrence (Fynbos): 3 901 km<sup>2</sup> with 20% conserved and 30% lost; Occupancy: 1 249 km<sup>2</sup> with 16% conserved and 29% lost. Fragmentation index: 20%.**Nature Reserves** (1566 records): 31% in nature reserves.**Habitat destruction** (1450 records):

91% extensive natural habitat, 6% islands, 2% road verges, 1% naturally linear habitats.

**Alien Invasive Species** (1447 records):38% *Pinus*, 25% Fabaceae (chiefly alien *Acacia*), 19% none, 14% *Hakea*, 4% Myrtaceae.**Alien Density** (1442 records): 19% alien-free, 61% sparse, 16% abundant, 4% dense.**Cultivation & Utilization:****Picking** (1098 records): 98% no sign of picking, 2% lightly picked.**Cultivation Status:** Plantings - 22 records (1%), Escapes - 6 records (0.4%).**Witch's Broom Infestation:** 18 records (1%).**Atlassers Notes:**

Baboons had destroyed some flowerheads (LYM96070601+3+8);

Small form - dwarf in stature (but not *P. longifolia minor* (LYM96082104);

Numerous plants have portions of the leaves "rolled closed" and red - caused by scale insect type bug (AJT96082911);

Evidently planted next to stacked alien heaps (CVV98100905);

Although shorter than expected, seem to be at about the same density to prefire (AGR99072902);

Dying (CFR99072903); Lots of plants dieing (AGRY0110512); All dead (AGRY1012803);

**Confusing Species:** Many identification queries due to hybrids. The most common misidentifications were in young veld with *P. neriiifolia* (which sometimes has long, thin leaves with attenuate bases), *P. burchellii* (which has much shorter leaves) and *P. magnifica* (with much wider leaves)..

Records of identification queries = 9.

Records of corrected identification queries = 7.

**Variation and Taxonomy:** Highly variable on account of rampant hybridization. Hybrids seem to preferentially backcross to *P. longifolia* so that some populations seem to have characters of associated species. Involucral bract colour is usually yellow or creamy green, but pink and red forms do occur. The awn colours are usually black, occasionally white forms occur. Smaller flowered forms occur. The dwarf form which replaces the normal form in the Agulhas area is treated separately (see *P. longifolia minor*). Occasional plants with small flowerheads are found within normal populations, some of which might be hybrids with smaller ground proteas (in which case the plants are usually dwarfed), and some of which appear to be simply smaller flower forms on normal plants.**Distribution:** Add.

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## *Protea longifolia* var. *minor* Dwarf Long-leaf Sugarbush

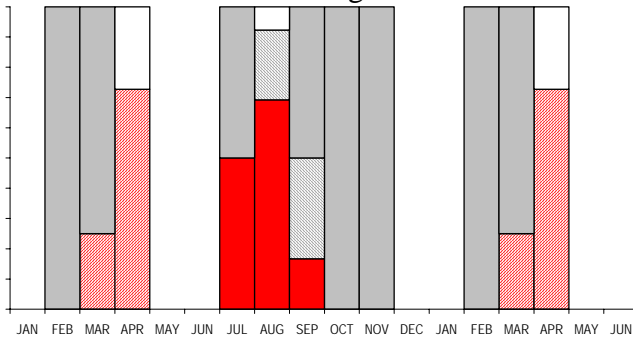
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

### 43 Records

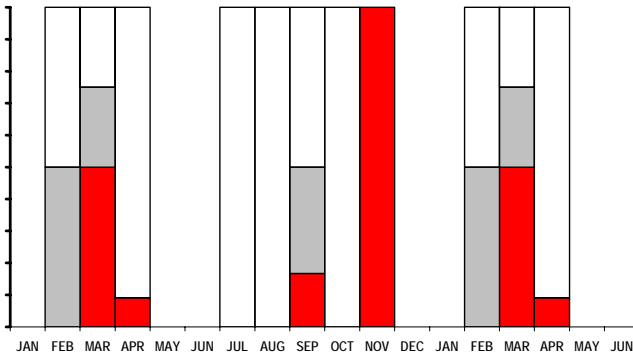
**Population** (42 records): 24% Common, 55% Frequent, 19% Rare, 2% Extinct.

**Dispersion** (36 records): 72% variable, 28% clumped.

**Flowering** (40 records with: Jan 0, Feb 2, Mar 4, Apr 11, May 0, Jun 0, Jul 2, Aug 13, Sep 6, Oct 1, Nov 1, Dec 0): Buds from Mar 25 - Apr 73 -; Flowering from Jul 50 - Aug 69 - Sep 17 -; Peak Flowering from ; Over from Aug 23 - Sep 33 -; Fruit from Feb 100 - Mar 75 - Jul 50 - Sep 50 - Oct 100 - Nov 100 -; Nothing from Apr 27 - Aug 8. Peak levels unreliable at 92% in Aug.



**Growth** (40 records with: Jan 0, Feb 2, Mar 4, Apr 11, May 0, Jun 0, Jul 2, Aug 13, Sep 6, Oct 1, Nov 1, Dec 0): Much from Mar 50 - Apr 9 - Sep 17 - Nov 100 -; Rare from Feb 50 - Mar 25 - Sep 33 -; None from Feb 50 - Mar 25 - Apr 91 - Jul 100 - Aug 100 - Sep 50 - Oct 100. Peak levels unreliable.



**Seedlings** (12 records): All without any seedlings present.

**Fire Survival** (6 records): 83% survived by seedlings only, 17% eliminated from the area by fires.

**Age to first flowering:** y4 100% (1), y7 100% (2), y9 100% (2), y11 100% (1). First flowers recorded at 4 years, 50% estimated at xx years, and 100% recorded at 4 years.



**Height** (40 records): 8% 0-0.2 m tall, 85% 0.2-1 m tall, 8% 1-2 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

### Habitat:

**Distance to Ocean** (42 records): 100% inland - further than 2 km from coast.

**Altitude** (42 records): 20 - 180 m; 20<sub>lq</sub> - 40<sub>med</sub> - 40<sub>uq</sub> m.

**Landform** (41 records): 98% deep soil, 2% riverine.

**Slope** (41 records): 54% platform, 27% gentle incline, 10% valley bottom, 7% hill top, 2% steep incline.

**Aspect** (20 records):

52% North,  
18% South,  
15% East,  
15% West.

**Soil Type** (41 records):

56% sandy,  
27% loamy,  
15% clayey,  
2% gravelly.

**Soil Colour** (41 records): 56% brown, 27% grey, 10% white, 5% yellow, 2% orange.

**Geology** (36 records): 47% silcrete or ferricrete, 22% sandstone, 17% Tertiary sands, 11% shale, 3% limestone.

**Vegetation** (42 records): 100% shrubland.

### Conservation Status and Threat:

**Red Data List Status:** Endangered A3c, B1b(i,ii)c(iv)+2b(i,ii)c(iv).

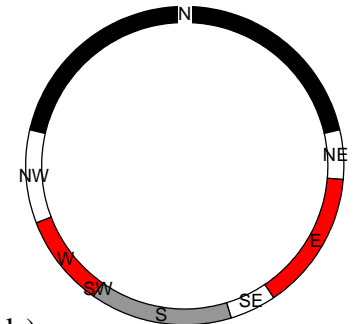
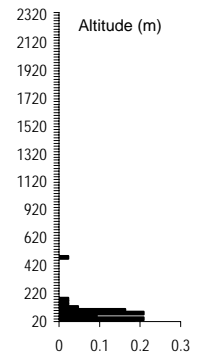
**Occurrence (Fynbos):** 198 km<sup>2</sup> with 8% conserved and 47% lost; **Occupancy:** 62 km<sup>2</sup> with 12% conserved and 38% lost. **Fragmentation index:** 25%.

**Nature Reserves** (42 records): 17% in nature reserves - inadequately conserved.

**Habitat destruction** (40 records): 88% extensive natural habitat, 5% islands, 5% naturally fragmented habitats, 3% naturally linear habitats.

**Alien Invasive Species** (40 records): 50% Fabaceae (chiefly alien *Acacia*), 28% none, 13% Myrtaceae, 10% *Pinus*.

**Alien Density** (40 records): 28% alien-free, 45% sparse, 23% abundant, 5% dense.



**Cultivation & Utilization:**

**Picking** (24 records): 96% no sign of picking,  
4% lightly picked.

**Cultivation Status:** Plantings - 1 records (2%).

**Witch's Broom Infestation:** 1 records (2%).

**Atlases Notes:**

*Protea longifolia minor* - looked like *P. pudens* to me! (SMRY0081608);

**Confusing Species:** Easily mistaken for normal *P. longifolia* when young – in fact, impossible to tell from the type. When in flower the flowerheads are noticeably shorter and the plants may appear smaller. Except when in flower, also easily mistaken for *P. pudens*, but this has reddish involucre bracts, far less of a cone, and prostrate not erect, flowerheads. *P. pudens* is not always a prostrate plant which means that plants in

seed are sometimes confused. The matter is complicated by occasional hybrids where the two species grow in association. No other misidentifications are known.

Records of identification queries = 4.

Records of corrected identification queries = 4.

**Variation and Taxonomy:** This variety should be ranked a subspecies as it is geographically distinct, although intermediates occur at the edges with *P. longifolia*. Hybrids with *P. pudens*

**Distribution:** Add.

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*Protea obtusifolia* Buek ex Meisn.  
**Limestone Sugarbush**  
*Bredasdorpsuikerbos*

**Other Common Names:** Bredasdorp Sugarbush, Holiday-red Protea, Jester Sugarbush, Obtusifolia, Stilbay Sugarbush, Klipprotea, Strandveldsuikerbos.

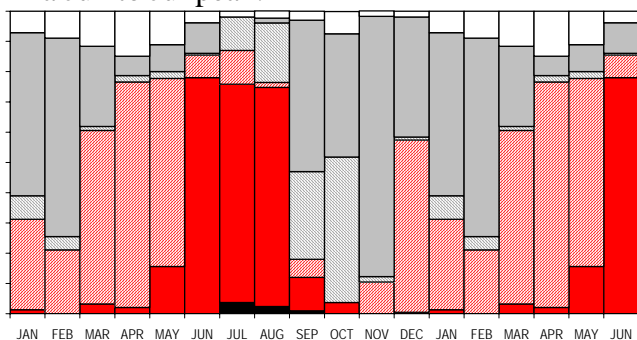
**Other Scientific Names:** *calocephala* Meisn 1856, *gandogerii* Schinz ex Gandoger 1913.

**1368 Records**

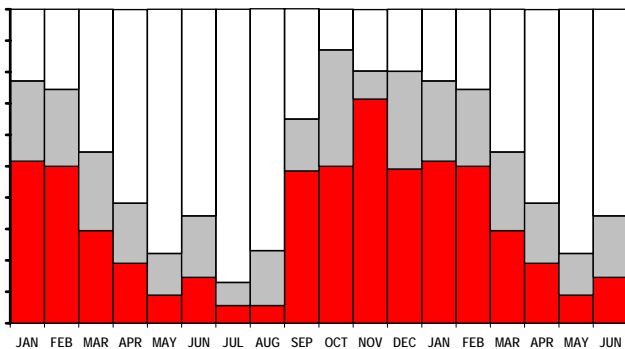
**Population** (1330 records): 41% Common, 49% Frequent, 9% Rare.

**Dispersion** (1197 records): 79% variable, 16% clumped, 4% widespread.

**Flowering** (1251 records with: Jan 154, Feb 90, Mar 155, Apr 47, May 45, Jun 159, Jul 54, Aug 127, Sep 100, Oct 54, Nov 57, Dec 209): Buds from Dec to May; Flowering from Jun to Aug; Peak Flowering not significant; Over from Aug to Oct; Fruit from Sep to Mar; Nothing not significant. Peak levels at 98% in Jul. Historically recorded as flowering from Apr to Sep, with a Jun to Jul peak.



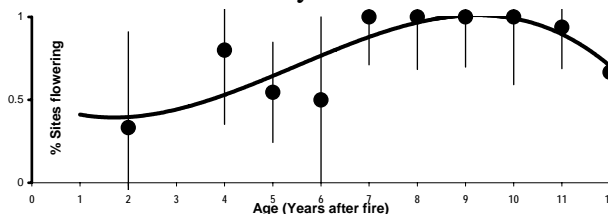
**Growth** (1248 records with: Jan 153, Feb 90, Mar 156, Apr 47, May 45, Jun 158, Jul 54, Aug 126, Sep 97, Oct 54, Nov 56, Dec 212): Much from Sep to Mar; Rare from Dec to Mar, Jun 20 and Oct; None from Nov to Sep. Peak levels at 87% in Oct.



**Seedlings** (594 records): Absent in 96%: fewer seedlings than prefire adults in 1 case, and more in 10 cases. Seedlings found in Jan (3), Nov and Dec (7).

**Fire Survival** (32 records): 75% survived by seedlings only, 19% escaped fires in fire-safe areas, 6% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded at 7 years.



**Height** (1261 records): 0.5% 0-0.2 m tall, 23% 0.2-1 m tall, 64% 1-2 m tall, 13% 2-5 m tall.

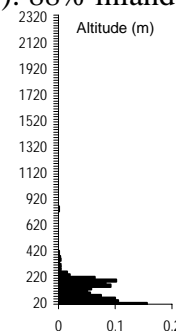
**Pollinators** (42 records): 74% birds, 19% bees or wasps, 7% beetles.

**Detailed Pollinators** (37 records): Cape Sugarbird (25), Honey Bee (4), Orange-breasted Sunbird (3), Southern Double-collared Sunbird, Solitary Bee, Protea Rove Beetle, Malachite Sunbird, Great Protea Beetle.

**Habitat:**

**Distance to Ocean** (1340 records): 88% inland - further than 2 km from coast.

**Altitude** (1340 records): 20 - 400 m; 20<sub>lq</sub> - 80<sub>med</sub> - 140<sub>uq</sub> m.



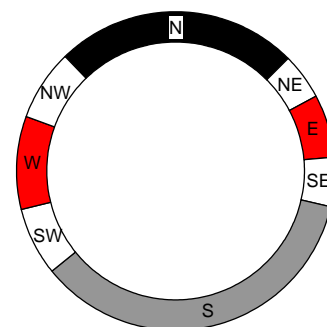
**Landform** (1259 records): 57% deep soil, 41% shallow soil, 2% rocky outcrops.

**Slope** (1259 records): 40% gentle incline, 28% platform, 13% hill top, 8% dunes, 8% steep incline, 3% valley bottom.

**Aspect** (796 records): 42% South, 31% North, 16% West, 11% East.

**Soil Type** (1237 records): 67% sandy, 22% loamy, 7% rocky, 2% gravelly, 1% clayey.

**Soil Colour** (1227 records): 44% grey, 35% brown, 6% white, 5% black, 4% yellow, 4% red, 2% orange.



**Geology** (1301 records): 86% limestone, 7% Tertiary sands, 5% sandstone, 2% shale.

**Vegetation** (1334 records): 98% shrubland, 2% thicket.

**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened A4c. Occurrence (Fynbos): 4 262 km<sup>2</sup> with 15% conserved and 25% lost; Occupancy:



1 263 km<sup>2</sup> with 32% conserved and 18% lost. Fragmentation index: 14%.

**Nature Reserves** (1340 records): 38% in nature reserves.

**Habitat destruction** (1238 records): 86% extensive natural habitat, 9% islands, 2% road verges, 2% naturally fragmented habitats, 1% naturally linear habitats.

**Alien Invasive Species** (1222 records): 71% Fabaceae (chiefly alien *Acacia*), 27% none.

**Alien Density** (1218 records): 28% alien-free, 39% sparse, 18% abundant, 13% dense, 3% impenetrable.

#### **Cultivation & Utilization:**

**Picking** (955 records): 99% no sign of picking, 0.5% lightly picked, 0.4% severely picked.

**Cultivation Status:** Plantings - 21 records (2%), Escapes - 6 records (0.4%).

**Witch's Broom Infestation:** 48 records (4%).

#### **Atlassers Notes:**

##### **Variation**

White flowers (APE92080111, LYM97081501, LYM97081615); Both the pink and white forms (NGW98070702);

Pruned to look like trees! (AGR94111301)

##### **Mortality**

New growth had died. Was this because of the hot summer? (NGFY0061606);

1 dead seen (AGRY2092611, AMMY2100913); All plants dead (LYMY0021403);

Bushcut all dead (AGRY0061823);

Masses of dead plants about 3 years old – pre-flowering (OUTY1020309);

#### **Flower visitors**

Ants and bees (WMPY0061603);

Arum Lily Frog in flowerhead (AGR97081610);

#### **Habitat**

On rock slabs (SGAY1031420); Magic! Plot mostly limestone pavement with round plantpot size holes colonised by proteas (SMRY1031411);

A rare occurrence on deep sand (RMC92101201); Very unusual to see growing in sandstone (DOA99031502);

#### **WitchesBroom**

Occasional (SMRY1031407); Some (SMRY1031409-11)

**Confusing Species:** Quite distinct! Mistaken for *P. neriifolia* (wrong habitat and beardless involucre bracts) and *P. susannae* (which has untidy seedheads, wavy margins to the leaves which stink).

Records of identification queries = 14.

Records of corrected identification queries = 6.

**Variation and Taxonomy:** None known, apart from involucre bract colour which is very variable from pure white, through creamy-white and yellow to deep carmine. Atlassers noted some unusual exclusively pale populations.

**Distribution:** Add.

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*Protea pudens* Rourke 1979

**Bashful Sugarbush**

*Aardroos*

**Other Common Names:** Creeping Protea, Ground-rose Sugarbush, Minor Protea, *Kleinsuikerbos*, *Minor*, *Ranksuikerbos*, *Skaambloppetjie*, *Skaamgesiggie*, *Skaamsuikerbos*.

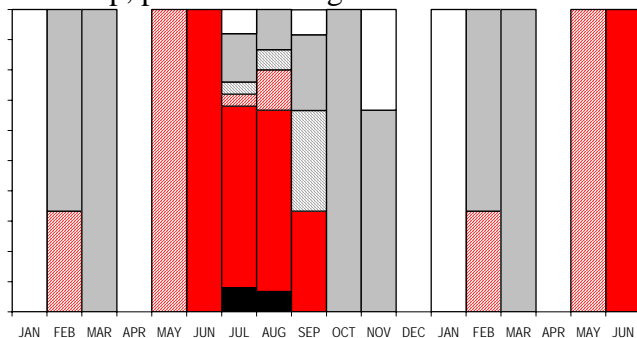
**Other Scientific Names:** *minor* Auct <date>.

**76 Records**

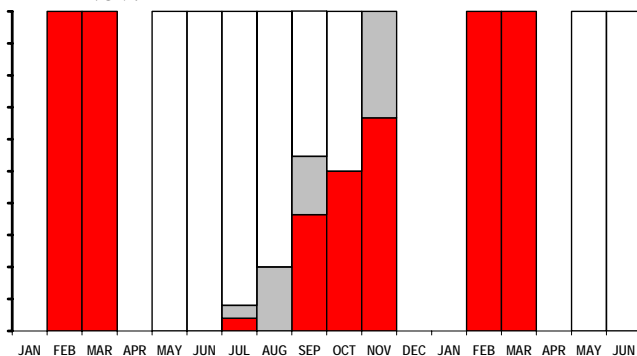
**Population** (67 records): 16% Common, 58% Frequent, 24% Rare, 1% Extinct.

**Dispersion** (54 records): 69% variable, 28% clumped, 4% widespread.

**Flowering** (64 records with: Jan 1, Feb 3, Mar 1, Apr 0, May 1, Jun 1, Jul 25, Aug 15, Sep 12, Oct 2, Nov 3, Dec 0): Buds from Feb and May; Flowering from Jun to Sep; Peak Flowering not significant; Over from Sep; Fruit from Sep to Mar; Nothing from Nov to Jan. Peak levels probably at 87% in Aug. Historically recorded as flowering from May to Sep, peak Jul to Aug.



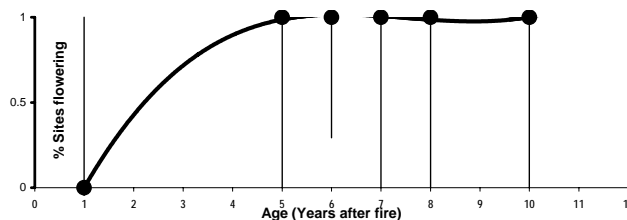
**Growth** (61 records with: Jan 0, Feb 2, Mar 1, Apr 0, May 1, Jun 1, Jul 25, Aug 15, Sep 11, Oct 2, Nov 3, Dec 0): Much from Sep to Mar; Rare from Aug and Nov; None from May to Oct. Peak levels unreliable at 100% in Nov.



**Seedlings** (14 records): Absent in 71%: more seedlings than prefire adults in 2 cases. Seedlings found in Jul.

**Fire Survival** (4 records): 50% eliminated from the area by fires, 50% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 5 years, 50% estimated at 3 years, and 100% recorded at 5 years.



**Height** (61 records): 10% 0-0.2 m tall, 90% 0.2-1 m tall.

**Pollinators** (4 records): 100% beetles.

**Detailed Pollinators** (4 records): Monkey Beetle.

**Habitat:**

**Distance to Ocean** (69 records): 100% inland - further than 2 km from coast.

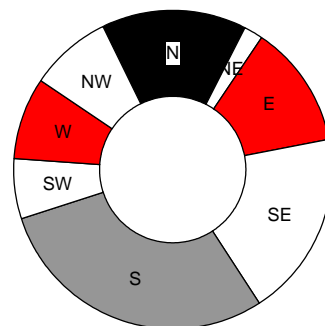
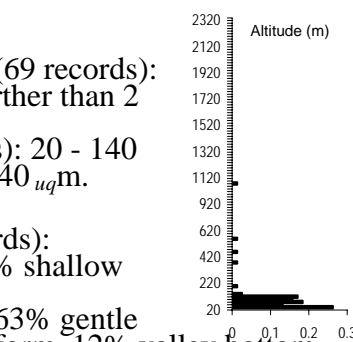
**Altitude** (69 records): 20 - 140 m; 20<sub>lq</sub> - 40<sub>med</sub> - 40<sub>uq</sub>m.

**Landform** (60 records): 92% deep soil, 8% shallow soil.

**Slope** (60 records): 63% gentle incline, 20% platform, 12% valley bottom, 5% hill top.

**Aspect** (43 records):

43% South, 23% East, 19% North, 15% West.



**Soil Type** (60 records):

47% loamy, 33% sandy, 10% clayey, 10% gravelly.

**Soil Colour** (57 records): 68% brown, 25% grey, 4% yellow, 2% black, 2% red.

**Geology** (63 records): 38% shale, 33% sandstone, 25% silcrete or ferricrete, 3% limestone.

**Vegetation** (69 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Endangered

B1a(ii)b(i,ii,iii,iv,v)+2a(ii)b(i,ii,iii,iv,v), Occurrence (Fynbos): 67 km<sup>2</sup> with 0% conserved and 45% lost; Occupancy: 40 km<sup>2</sup> with 0% conserved and 35% lost. Fragmentation index: 53%.

**Nature Reserves** (69 records): 19% in nature reserves - inadequately conserved.

**Habitat destruction** (58 records): 76% extensive natural habitat, 17% islands, 5% naturally linear habitats, 2% naturally fragmented habitats.

**Alien Invasive Species** (57 records):

40% Fabaceae (chiefly alien *Acacia*), 23% Myrtaceae, 19% none, 16% *Pinus*, 2% *Hakea*.

**Alien Density** (57 records): 19% alien-free, 67% sparse, 14% abundant.

**Cultivation & Utilization:**

**Picking** (47 records): 98% no sign of picking, 2% lightly picked.

**Cultivation Status:** Plantings - 7 records (9%), Augmentations - 3 records (4%).

**Witch's Broom Infestation:** 2 records (3%).

**Atlassers Notes:**

This area specially burnt to regenerate this species (MEL96070701);

This 1km area is also planted with *P. pudens* (MEL96070701); There were 3 plants naturally - the rest were clumped in neat rows and therefore planted (NGF97113011);

A few dead specimens (SMRY0072006);

Most moribund some with witches broom (AGRY0081607);

**Confusing Species:** Only readily confused with *P. longifolia* var. *minor*, with which it occasionally hybridizes. However, this has only erect flowerheads, and very few decumbent branches; in flower the pale heads with a long cone are quite distinctive.

Records of identification queries = 4.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** Flowerheads vary in size from 50 to 80 mm long. All known plants are deep dusty pink in colour – pale forms have not been recorded.

**Distribution:** Add.

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*Protea roupelliae* subsp. *hamiltonii* Beard ex Rourke 1978  
**Dwarf Silver Sugarbush**  
*Ranksilversuikerbos*

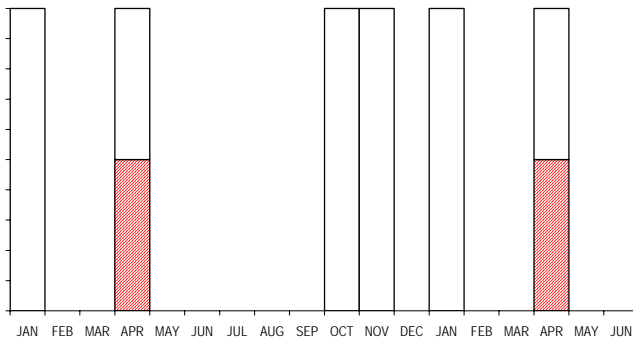
**Other Common Names:** Rambling-silver Sugarbush.  
**Other Scientific Names:** *None*.

**5 Records**

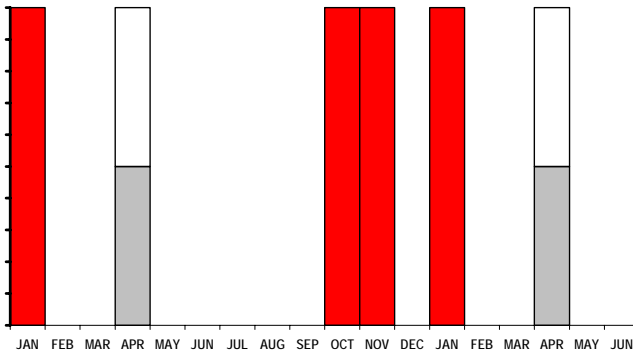
**Population** (4 records): 50% Common, 50% Frequent.

**Dispersion** (4 records): 75% variable, 25% clumped.

**Flowering** (5 records with: Jan 1, Feb 0, Mar 0, Apr 2, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 1, Nov 1, Dec 0): Buds from Apr; Flowering, Peak Flowering, Over – and significantly – Fruit not recorded; Nothing from all year round. Peak levels unreliable, but foresters report that no flowers were produced during the atlas project. No historical flowering times recorded.



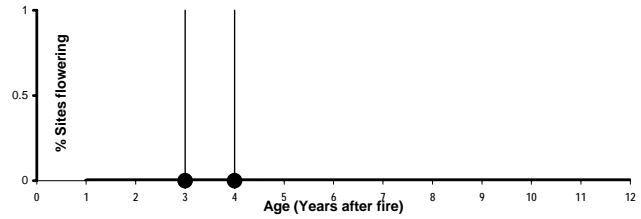
**Growth** (5 records with: Jan 1, Feb 0, Mar 0, Apr 2, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 1, Nov 1, Dec 0): Much from Oct to Jan; Rare from Apr; None from Apr. Peak levels unreliable at 100% from Oct to Jan.



**Seedlings** (3 records): Absent in 33%; fewer seedlings than prefire adults in 1 case. Seedlings found in Jan.

**Fire Survival** : No data.

**Age to first flowering:** Foresters report that no flowers were produced during the duration of Protea Atlas Project.



**Height** (5 records): 20% 0-0.2 m tall, 80% 0.2-1 m tall.

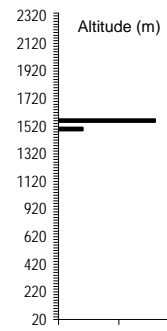
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (4 records): 100% inland - further than 2 km from coast.

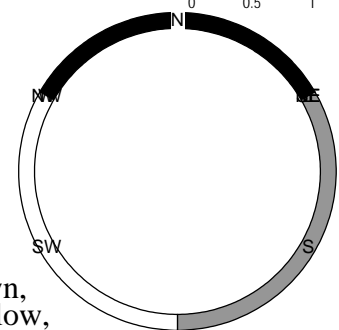
**Altitude** (4 records): 1440 - 1460 m; 1440 *lq* - 1460 *med* - 1460 *uq* m.



**Landform** (4 records): 100% deep soil.

**Slope** (4 records): 50% platform, 25% gentle incline, 25% valley bottom.

**Aspect** (2 records): 75% South, 25% West.



**Soil Type** (4 records): 50% loamy, 25% sandy, 25% clayey.

**Soil Colour** (4 records): 25% brown, 25% grey, 25% yellow, 25% red.

**Geology** (2 records): 100% shale.

**Vegetation** (4 records): 100% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Critically Endangered A2ac, B1a(ii)b(i,ii,iii,iv,v) +2a(ii)b(i,ii,iii,iv,v), C2a(i,ii).

**Occurrence:** 1 km<sup>2</sup> with 0% conserved and 92% lost; Occupancy: 3 km<sup>2</sup> with 0% conserved and 66% lost. Fragmentation index meaningless.

**Nature Reserves** (4 records): 75% in nature reserves - well conserved.

**Habitat destruction** (4 records): 100% islands.

**Alien Invasive Species** (4 records): 75% *Pinus*, 25% Myrtaceae.

**Alien Density** (4 records): 100% sparse.

**Cultivation & Utilization:**

**Picking** (4 records): 75% no sign of picking, 25% lightly picked.

**Cultivation Status:** Plantings - 1 record (20%).

**Atlassers Notes:**

We were told was declining in numbers and all plants that were seen had no buds or flowers or cones (NGFY0040403);

**Confusing Species:** None: distinct in growth habit – although in cultivation it does grow to 1m.

**Variation and Taxonomy:** None noted.

**Distribution:** Add.

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*Protea roupelliae subsp. roupelliae* Meisn. 1856

**Silver Sugarbush**

*Silwerblaarsuikerbos*

**Other Common Names:** Drakensberg Sugarbush, Roupell's Sugarbush, Silver-leaf Sugarbush, Sugarbush, Sugarbush Protea, Transvaal-silverleaf Sugarbush, *Silber Zuckerbusch*, *Silwersuikerbos*, *Siukerkan*, *Suikerbos*, *Transvaalwaboom*, *Waboom*, *Isicalabane* (Swazi), *Isidlungu* (Swazi), *isiQalaba* (Xhosa, Zulu), *Sekile* (S-Sotho), *Seqalaba* (S-Sotho), *uQhambathi* (Zulu).

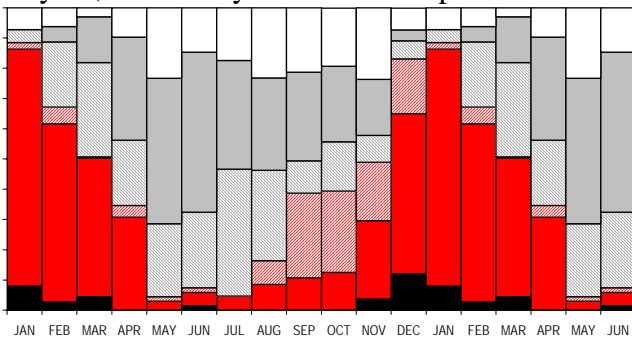
**Other Scientific Names:** *lanuginosus* (Kuntz)Schum 1898, *rudatisii* Engl 1915, *transvaalensis* (Gand)Gand & Schinz 1913.

**1681 Records**

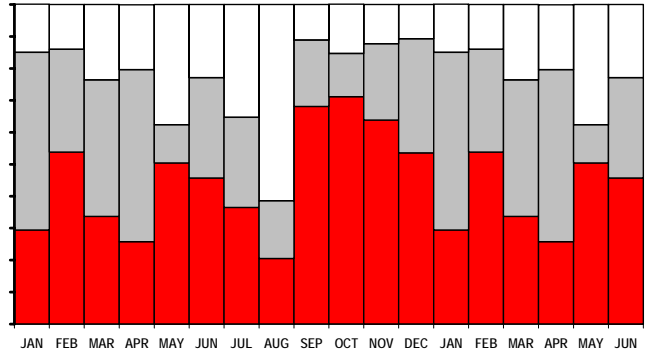
**Population** (1671 records): 23% Common, 59% Frequent, 18% Rare.

**Dispersion** (1580 records): 47% variable, 34% clumped, 12% widespread, 7% evenly distributed.

**Flowering** (1547 records with: Jan 138, Feb 177, Mar 199, Apr 185, May 133, Jun 68, Jul 86, Aug 164, Sep 75, Oct 104, Nov 135, Dec 83): Buds from Sep to Oct; Flowering from Nov to Apr; Peak Flowering not significant; Over from Feb to Aug; Fruit from Apr to Nov; Nothing from May and Aug to Nov. Peak levels at 93% in Jan. Historically recorded as flowering from throughout the year, but chiefly from Feb to Apr.



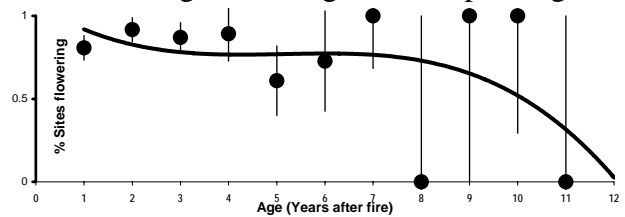
**Growth** (1530 records with: Jan 126, Feb 171, Mar 199, Apr 182, May 133, Jun 70, Jul 85, Aug 166, Sep 72, Oct 104, Nov 138, Dec 84): Much from all year round; Rare from Nov to Apr, Jun to Jul and Sep; None from Mar to Aug. Peak levels at 89% in Dec. Historically recorded as growing from all year round with a Jun to Aug peak in New Germany, KwaZulu-Natal.



**Seedlings** (760 records): Absent in 48%: fewer seedlings than prefire adults in 157 cases, and more in 39 cases. Seedlings found in Jan (20), Feb (16), Mar (29), Apr (5), May, Jun (13), Jul (11), Aug (18), Sep (3), Oct (20), Nov (22) and Dec (38).

**Fire Survival** (744 records): 53% escaped fires in fire-safe areas, 31% resprouted from aerial trunks, 10% resprouted from underground boles, 4% survived by seedlings only, 2% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100% recorded at 7 years. These ages probably reflect the grassland age, not the plant ages.



**Height** (1655 records): 0.1% 0-0.2 m tall, 4% 0.2-1 m tall, 21% 1-2 m tall, 71% 2-5 m tall, 4% taller than 5 m.

**Pollinators** (285 records): 56% birds, 27% beetles, 11% bees or wasps, 4% flies, 1% none observed, 0.4% mites.

**Detailed Pollinators** (107 records): Malachite Sunbird (54), Transvaal Sugarbird (40), Honey Bee (6), Great Protea Beetle (3), Wasp (unspecified) (2), Amethyst Sunbird (2).

**Habitat:**

**Distance to Ocean**

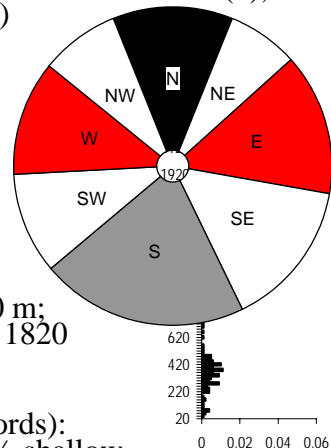
(1651 records): 99% inland - further than 2 km from coast.

**Altitude**

(1651 records): 20 - 2440 m; 1440 *lq* - 1660 *med* - 1820 *uq* m.

**Landform**

(1636 records): 44% deep soil, 38% shallow



soil, 18% rocky outcrops,  
**Slope** (1637 records): 54% steep incline,  
36% gentle incline, 7% hill top, 2% cliff,  
1.0% platform.  
**Aspect** (1528 records): 35% South, 25% East,  
20% West, 20% North.

**Soil Type** (1539 records): 61% loamy,  
23% sandy, 8% rocky, 4% gravelly,  
3% clayey.  
**Soil Colour** (1545 records): 68% brown,  
18% grey, 6% red, 3% black, 3% orange,  
2% yellow.  
**Geology** (1224 records): 79% sandstone,  
6% dolerite, 4% shale, 4% basalt,  
3% granite, 1% conglomerate.  
**Vegetation** (1633 records): 59% grassland,  
36% wooded grassland, 4% shrubland.

### **Conservation Status and Threat:**

**Red Data List Status:** Least Concern.  
Occurrence: 329 663 km<sup>2</sup> with 3% conserved  
and 22% lost; Occupancy: 2 395 km<sup>2</sup> with  
30% conserved and 14% lost. Fragmentation  
index: 1%.

**Nature Reserves** (1651 records): 50% in nature  
reserves.

**Habitat destruction** (1553 records):  
84% extensive natural habitat, 8% islands,  
4% naturally linear habitats, 1% naturally  
fragmented habitats, 1% corridors.

**Alien Invasive Species** (1442 records):  
64% none, 21% Fabaceae (chiefly alien  
*Acacia*), 11% *Pinus*, 1% other aliens,  
1% Myrtaceae.

**Alien Density** (1439 records): 64% alien-free,  
27% sparse, 5% abundant, 4% dense.

### **Cultivation & Utilization:**

**Picking** (1066 records): 99% no sign of  
picking, 0.9% lightly picked, 0.3% severely  
picked.

**Cultivation Status:** Plantings - 3 records  
(0.2%).

### **Atlassers Notes:**

#### **Variation**

Very silver! (AGR99021609!); Very pretty cerise  
form (VCHY0021901); The "green" form  
(JEB92010501);

#### **Size distribution**

Not killed bole: 21; very small not killed trunk:  
16; thick brown or green trunk not killed  
escape: 19; looking back it meant all of them  
really escaped a cool fire - walking further  
we saw lots more low plants  
(AWA95051901);

13 dead above 2m; 100+ less than 1m; 8 up to  
2m; 5 above 2m. Why no medium plants?  
(AWA95052601);

Very small plants next to big plants  
(DFJ99081902); The area had two distinct  
populations according to size : about half  
population was 2-5 m high the rest about 30  
cm high (HANY1011302); Colony of small  
plants around one larger tree  
(JOO99091102); Range in size from HC1-4  
(MHG96062501); Healthy population; all  
sizes from 0 3m to 5m (SGAY1033001);

#### **Fire survival**

'Weathers' fire (APE94021202); Seedlings few  
to none - grass burnt annually

(ATA92030401) Fire did not reach rock bed  
(AWA96052203); Although recently burnt  
the fire did not reach most of the plants as  
they are mostly amongst boulders  
(BRB96072002); 80% of adult trees  
destroyed - some are partially burnt mainly  
on sides. No reprofing present  
(DDS91122401); Resprouting after fire  
(DDS92120901+2); Proteas burnt at lower  
branches and leaves some trees are dead.  
Damage not significant (DDS93110603);  
Light fire (grass mainly short) burnt only  
lower branches and leaves of proteas few  
dead protea trees a few also burnt near  
canopy but not extensive (DDS93110604);  
Trees start to reprof (after rainfall of late  
sept to dec?) Mainly at the end of the  
branches - leave tips. The canopies of trees  
are not damaged by the fire and some have  
still flowers (DDS93112401); Trees who are  
only burnt at lower parts shown more  
resprouting. Several trees with burnt  
branches have new buds on branch tips  
(DDS94022702); Fire damage only on  
isolated trees - large trees destroyed (n=6)  
fewer have topkill - fire old - 1 yr but  
probably only grass burns - protea trees very  
large and full flower (DDS94120701);  
Several protea trees burnt down & crowns  
(DDS96122101); Some burnt proteas start to  
regrowth at burnt ends some trees dead other  
only burnt on sides (DDS96122801); Only  
few trees (< than 6) not damaged by fire -  
crowns not burnt rest of clump 100% crown  
fire and are destroyed by fire of august 1996  
the fire was chased by the wind  
(DDS97012301); Frequently burnt veld so  
plants always above flames and protected by  
rock band (DFJ99081901); Clear fire  
protection of rock slab in burnt overgrazed  
veld (DFJ99081902); Several dead -  
remainder in a very poor state ( fire) -  
another fire will probably kill them  
(JCVY0040903); In a very poor condition  
due to veld fires (JCVY1032701); Last  
survivor of larger clump rest dead !  
(SRIY0052302); 2/3 killed by fire  
(JCVY1032703); More than half killed by  
fire (KPB93053003); About 10% of trees  
killed during last fire (LOTY1021702); 5  
Out of a total of 7 were killed by the fire -  
the 2 remaining ones have only the topmost  
branches still living (RHE99013001); The  
fire must have been very hot at this site as  
there were about 5 dead trees  
(PAB98102902);

Seeds all over! (LOT94101802);

Some Seedlings (MSA99111701); It Was A  
Pleasant Surprise To See Plenty Of Seedlings  
(NAU95011904);

Seed Viability Test Done By Reserve  
Management Indicate Seeds To Be Mostly  
Sterile (NAU95011904);

#### **Mortality**

One dead (AGR99082412); A few dead  
(AGRY0040638, AJPY0021202); Expired  
(AJPY0021201); About 10 dead trees  
(PAB98102902);

The trees mostly very old. in sorry state hard  
hit by the droughts. Very few flowers. A  
dying population with few young trees  
(APE93020612);



### **Habitat**

Along drainage line (ATA93012301-3, ATA93012301, ATA94112202, ATA94112301); In moist places (ATA94112405); Hugging edges top of hill of side stream (AWA95052404); There were just a few trees on both sides of the stream banks which varied from 1-15m tapering out as it wanders out of the reserve. There is the odd tree or three along this NE slope (BRB96011404);

Mainly on steeper slopes and kran edges (ATA99042802); On top of gigantic fallen rock (AWA96052215); Were even growing in fissures in huge rocks (BRB99013006); Remarkable size on a fire protected ledge (DFJ99081906);

In a group on top of a small rise (BRB96032304); Clumped stand just below summit of flat top hill (OUTY0101906); Only at sandstone ledge (TDK99040704);

### **Parasitism**

With outgrowth on leaves (forms a tube) (LOT94110901); Heavily parasitized by Mistletoe *Tapinanthus* sp (MSA93110502); Ring - barked; leaves riddled with insect larvae (PHM92102402);

Tips of leaves have been browsed - don't know by what (RHEY1092404);

Trees were very sparsely leaved (LOT95041101);

### **Firewood**

Heavy cutting for firewood (AGR99082008); A big concern is the collecting of firewood by the loads (they just climb over the fence). several branches of small or longish trees are cut of and it will not be long before all the trees are collected? (DDS93112401); Large trees who are destroyed by fire totally (smaller trees) are cut of by locals of surrounding for firewood several trees (at least 10 trees) are destroyed in this manner (DDS94022702); Chopping for firewood seems to be a threat (DDS94120501); 3

Large specimens chopped down in this area (LDM99010501); Branches sawn off trees (RBW99031403); Chopped - harvested for firewood (SRI99082005); Wood-cutting of dead trees by locals (WIJ99032806); Evidence of harvesting - probably for fuel (WMP99081905); Harvesting (WMP99081907, WMP99082002);

### **Browsing**

Young plants grazed (RSRI99082004); Lots of young plants have tops chewed off (WMP99082002);

### **Visitors**

The bright green 6mm beetles are *Melyris* Spp (APE93020612); Golden spider, also sunbird (HANY1011302); Ants occur on most of the flowers. beetle was small green/blue colour possibly of Scarabidae type but uncertain (RGR93041401); Ants (WIJ99032804);

**Confusing Species:** One instance of misidentification with *P. caffra*. With a distinctive growth habit and leaf shape, it is not easily confused.

Records of identification queries = 11.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** Variable in leaf colour and hairiness (silky silver *versus* glabrous green), leaf dimensions, bract colour (creamy yellow to deep pink) and awn colour (pale pink to deep purple/black, rusty red or brown). Whereas the latter colours vary within populations, the leaf colours are far more fixed, but sadly atlassers did not document where the colour forms occur.

**Distribution:** Add.

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*Protea susannae* Phill. 1910  
**Stink-leaf Sugarbush**  
*Stinkblaarsuikerbos*

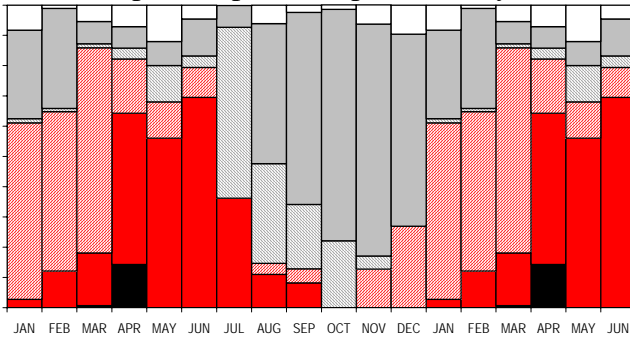
**Other Common Names:** Susan's Sugarbush, *Sandprotea*.  
**Other Scientific Names:** *None*.

**1013 Records**

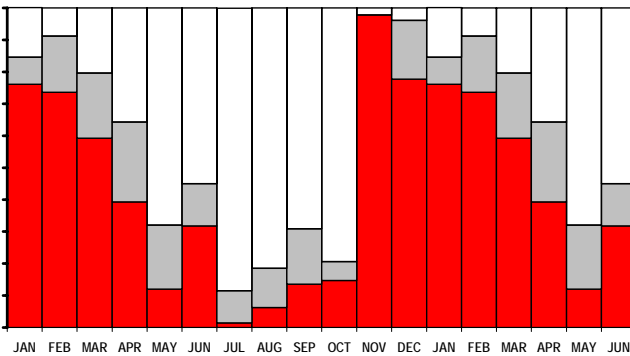
**Population** (958 records): 48% Common, 40% Frequent, 10% Rare.

**Dispersion** (868 records): 73% variable, 20% clumped, 6% widespread, 1% evenly distributed.

**Flowering** (951 records with: Jan 72, Feb 91, Mar 149, Apr 28, May 25, Jun 131, Jul 69, Aug 82, Sep 85, Oct 68, Nov 47, Dec 104): Buds from Dec to Mar; Flowering from Apr to Jul; Peak Flowering not significant in Apr; Over from Jul to Oct; Fruit from Aug to Feb; Nothing not significant. Peak levels at 87% in Mar. Historically recorded as flowering from Apr to Sep, with a peak in May to Jul.



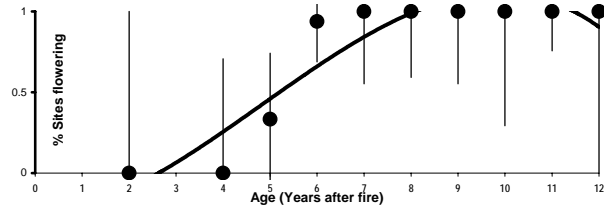
**Growth** (939 records with: Jan 71, Feb 91, Mar 147, Apr 28, May 25, Jun 129, Jul 69, Aug 81, Sep 81, Oct 68, Nov 46, Dec 103): Much from Nov to Apr and Jun; Rare from Mar to May; None from Mar to Oct. Peak levels at 98% in Nov.



**Seedlings** (422 records): Absent in 99%; fewer seedlings than prefire adults in 2 cases, and more in 1 case. Seedlings found in Feb, Jul, and Aug.

**Fire Survival** (12 records): 50% survived by seedlings only, 33% escaped fires in fire-safe areas, 8% eliminated from the area by fires, 8% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 5 years, and 100% recorded consistently at 7 years.



**Height** (954 records): 0.3% 0-0.2 m tall, 13% 0.2-1 m tall, 52% 1-2 m tall, 34% 2-5 m tall, 1% taller than 5 m.

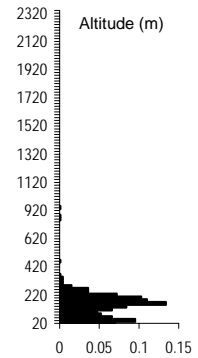
**Pollinators** (51 records): 98% birds, 2% bees or wasps.

**Detailed Pollinators** (51 records): Cape Sugarbird (45), Orange-breasted Sunbird (3), Southern Double-collared Sunbird, Malachite Sunbird, Honey Bee.

**Habitat:**

**Distance to Ocean** (954 records): 88% inland - further than 2 km from coast.

**Altitude** (954 records): 20 - 340 m; 60 *lq* - 140 *med* - 160 *uq*m.

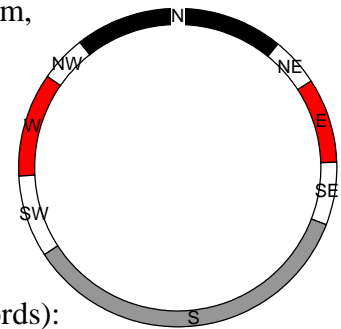


**Landform** (922 records): 90% deep soil, 10% shallow soil.

**Slope** (918 records): 39% gentle incline, 36% platform,

10% valley bottom, 7% hill top, 5% dunes, 3% steep incline.

**Aspect** (552 records): 44% South, 26% North, 17% West, 14% East.



**Soil Type** (916 records): 89% sandy, 8% loamy, 2% rocky.

**Soil Colour** (901 records): 38% grey, 31% brown, 11% white, 8% red, 6% yellow, 5% orange.

**Geology** (902 records): 49% limestone, 34% Tertiary sands, 13% sandstone, 2% silcrete or ferricrete, 1% shale.

**Vegetation** (945 records): 99% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened A2c+4c.

**Occurrence** (Fynbos): 4 287 km<sup>2</sup> with 15% conserved and 25% lost; **Occupancy:** 921 km<sup>2</sup> with 29% conserved and 15% lost. **Fragmentation index:** 10%.

**Nature Reserves** (954 records): 41% in nature reserves.

**Habitat destruction** (898 records): 82% extensive natural habitat, 8% islands, 4% naturally linear habitats, 3% road verges, 3% naturally fragmented habitats.

**Alien Invasive Species** (886 records):

71% Fabaceae (chiefly alien *Acacia*),  
23% none, 4% *Pinus*, 2% Myrtaceae.

**Alien Density** (884 records): 24% alien-free,  
47% sparse, 17% abundant, 11% dense,  
1% impenetrable.

**Cultivation & Utilization:**

**Picking** (716 records): 96% no sign of picking,  
3% lightly picked, 1% severely picked.

**Cultivation Status:** Plantings - 44 records  
(4%), Escapes - 6 records (0.6%).

**Witch's Broom Infestation:** 25 records (2%).

**Atlasers Notes:**

About 4m diameter (OUTY0072712);

Pruned to look like trees! (AGR94111301);

Heavily grazed (NGFY0061811)

1 dead skeleton (AGRY1030837); Was dead  
(SASY0061713);

A large part of this plot had been bush cut hence  
dead plants (NGFY0061810);

In gully on black soil (AGR96122815);  
Concentrated on deep sandy soil patches  
(SGAY1031412);

**Witches Broom**

Much (SMRY0032903); Some

(SMRY1031408, SMRY2082904); On 3 or 4  
plants (SMRY2082903);

**Confusing Species:** Mistaken for *P. obtusifolia*  
which has odourless, straight-edged,  
hard leaves and neat seedheads. A case of *P.*  
*scabriuscula* is inexplicable.

Records of identification queries = 26.

Records of corrected identification queries = 16.

**Variation and Taxonomy:** .

**Distribution:** Add.

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*Protea coronata* Lam. 1791

**Green Sugarbush**

*Groenhofiesuikerbos*

**Other Common Names:** Apple-green Sugarbush, Emulous Erodendrum, Green-head Sugarbush, Kreupelhout, Slovenly Erodendrum, Small Green Sugarbush, *Groenprotea*, *Groensuikerbos*.

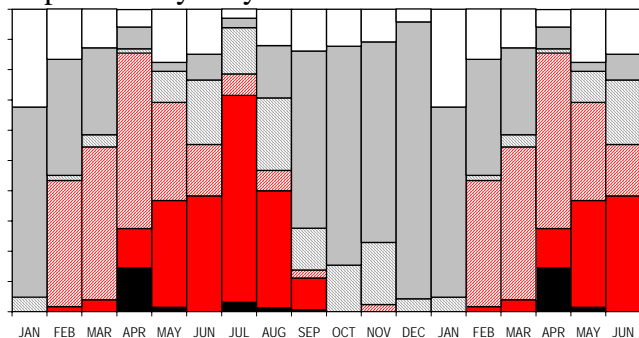
**Other Scientific Names:** *incompta* (Salisb. ex Knight) RBr 1809, *incorrupta* Krauss 1846, *macrocephala* Thunb 1803.

**1035 Records**

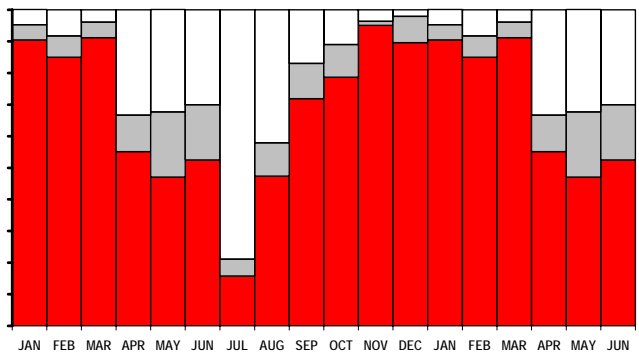
**Population** (984 records): 4% Abundant, 39% Common, 44% Frequent, 13% Rare.

**Dispersion** (926 records): 62% variable, 31% clumped, 5% widespread, 2% evenly distributed.

**Flowering** (1018 records with: Jan 62, Feb 60, Mar 101, Apr 69, May 68, Jun 47, Jul 98, Aug 75, Sep 152, Oct 156, Nov 83, Dec 47): Buds from Feb to May; Flowering from May to Aug; Peak Flowering from insignificant but peaking in Apr; Over from Jun, Aug and Nov; Fruit from Sep to Mar; Nothing from Jan. Peak levels at 94% in Jul. Historically recorded as flowering from Apr to Sep, particularly May to Jul.



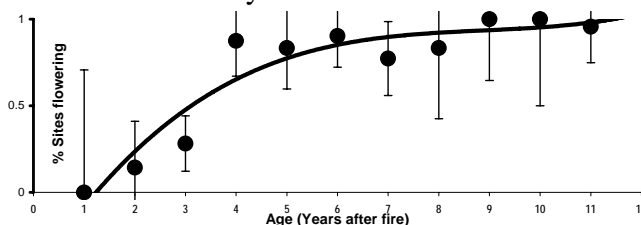
**Growth** (1011 records with: Jan 63, Feb 60, Mar 102, Apr 69, May 68, Jun 40, Jul 95, Aug 76, Sep 153, Oct 155, Nov 82, Dec 48): Much from Aug to Jun; Rare from May; None from Apr to Aug. Peak levels at 98% in Dec.



**Seedlings** (376 records): Absent in 89%: fewer seedlings than prefire adults in 8 cases, and more in 13 cases. Seedlings found in Apr (2), Jun (2), Jul, Sep (5), Oct (9) and Nov (2).

**Fire Survival** (54 records): 69% survived by seedlings only, 22% escaped fires in fire-safe areas, 9% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 9 years, with a slight decline after 21 years.



**Height** (1025 records): 1% 0-0.2 m tall, 21% 0.2-1 m tall, 54% 1-2 m tall, 23% 2-5 m tall, 0.5% taller than 5 m.

**Pollinators** (23 records): 91% birds, 4% bees or wasps, 4% beetles.

**Detailed Pollinators** (22 records): Cape Sugarbird (16), Orange-breasted Sunbird (6).

**Habitat:**

**Distance to Ocean** (981 records): 96% inland - further than 2 km from coast.

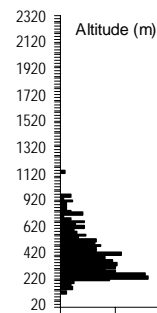
**Altitude** (982 records): 20 - 2360 m; 260 *lq* - 360 *med* - 460 *uq* m.

**Landform** (980 records): 92% deep soil, 5% shallow soil, 2% rocky outcrops, 0.6% riverine, 0.3% swamp.

**Slope** (980 records): 47% gentle incline, 35% steep incline, 9% platform, 7% hill top.

**Aspect** (831 records):

53% South,  
21% East,  
14% North,  
12% West.



**Soil Type** (924 records): 44% loamy, 31% sandy, 16% clayey, 8% gravelly, 1.0% rocky.

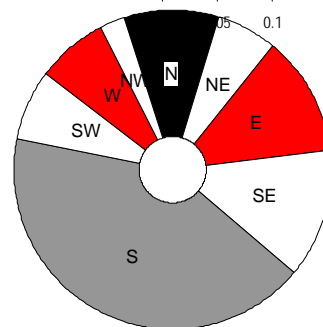
**Soil Colour** (927 records): 61% brown, 22% grey, 7% orange, 6% black, 2% yellow, 2% red.

**Geology** (941 records): 55% sandstone, 27% shale, 9% granite, 7% silcrete or ferricrete, 1.0% conglomerate.

**Vegetation** (974 records): 96% shrubland, 2% plantations.

**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened A2c+4c.



Occurrence (Fynbos): 15 049 km<sup>2</sup> with 22% conserved and 27% lost; Occupancy: 808 km<sup>2</sup> with 24% conserved and 30% lost. Fragmentation index: 2%.

**Nature Reserves** (982 records): 40% in nature reserves.

**Habitat destruction** (964 records): 76% extensive natural habitat, 12% islands, 10% road verges, 1% naturally linear habitats.

**Alien Invasive Species** (912 records): 33% *Pinus*, 29% none, 26% Fabaceae (chiefly alien *Acacia*), 10% *Hakea*, 2% Myrtaceae.

**Alien Density** (908 records): 29% alien-free, 56% sparse, 11% abundant, 4% dense.

**Cultivation & Utilization:**

**Picking** (605 records): 96% no sign of picking, 2% lightly picked, 2% severely picked.

**Cultivation Status:** Plantings - 30 records (3%), Augmentations - 1 record (0.10%), Escapes - 12 records (1%).

**Witch's Broom Infestation:** 10 records (1.0%).

**Atlassers Notes:**

Cut down [bushcut?] - veg remarkably short! (ASP92092004);

Severe picking near the roads less so in bush (SMRY1032201);

In great demand by florist in dry flower arrangements. The dead flowers are picked

put in sulphur chamber dried - the flower receptacle trimmed to look like a dried everlasting (VJK93101905)

Moribund - more than half plants died of old age (AGR91100607);

Lot of killed plants (AMMY0101306);

**Witches Broom**

Lots (OUT96092801); On several - bunch of miniature - leafed 60cm branches (SMR98081907); 2 plants (TLE98061308);

**Confusing Species:** Many instances of miscoding as Pr cord instead of Pr coro. The leaves are so different to any other protea that misidentification even of seedlings is difficult.

Records of identification queries = 13.

Records of corrected identification queries = 3.

**Variation and Taxonomy:** Flowerheads are constant, but leaves vary being Bright green and sparsely villous in the west, and silvery-sericeous in the Langeberg populations, which were previously regarded as a variety *susannae*.

**Distribution:** Add.

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# *Protea grandiceps* Tratt. 1805

## Red Sugarbush

### *Rooisuikerkan*

**Other Common Names:** Coral-coloured Protea, Grandiceps, Large-bud Sugarbush, Obtuse Erodendrum, Oval-leaf Sugarbush, Peach Sugarbush, Prince Protea, Princess Sugarbush, *Baardsuikerbos*, *Grootsuikerkan*, *Koraalsuikerbos*, *Perskesuikerbos*, *Rooi-oumaprotea*, *Suikerbos*.

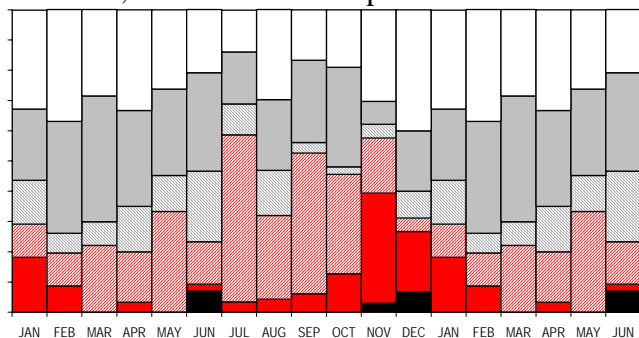
**Other Scientific Names:** *coccinea* RBr 1810, *obtusa* (Salisb. ex Knight) Sweet 1809, *rangiferina* Hort ex Roem <date>, *speciosa* Gawl 1801, *villifera* Lindl 1826.

#### 729 Records

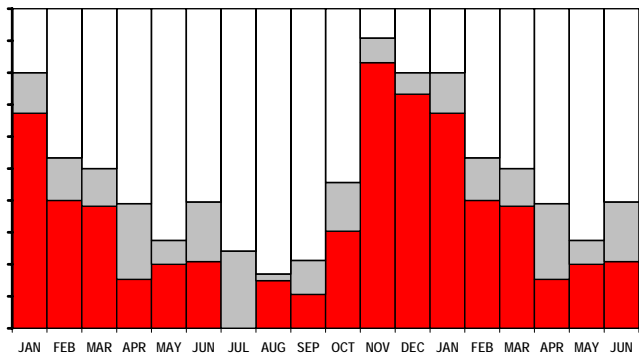
**Population** (654 records): 0.6% Abundant, 16% Common, 42% Frequent, 41% Rare, 0.8% Extinct.

**Dispersion** (537 records): 57% variable, 32% clumped, 7% widespread, 4% evenly distributed.

**Flowering** (703 records with: Jan 55, Feb 46, Mar 77, Apr 60, May 42, Jun 43, Jul 29, Aug 47, Sep 114, Oct 79, Nov 66, Dec 45): Buds from Mar, May and Jul to Oct; Flowering from Nov to Dec; Peak Flowering not significant; Over from Jun; Fruit from Dec to Jun and Aug to Oct; Nothing from Nov to Jun and Aug. Peak levels at 62% in Nov. Historically recorded as flowering from Sep to Jan, with a Dec to Jan peak.



**Growth** (696 records with: Jan 55, Feb 45, Mar 76, Apr 59, May 40, Jun 43, Jul 29, Aug 47, Sep 113, Oct 79, Nov 65, Dec 45): Much from Oct to Mar and May to Jun; Rare from Apr and Jul; None from Dec to Oct. Peak levels at 91% in Nov.

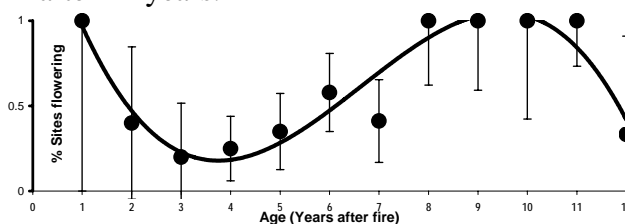


**Seedlings** (307 records): Absent in 90%; fewer seedlings than prefire adults in 8 cases, and

more in 8 cases. Seedlings found in Jan, Feb, Mar (3), Apr, May, Jun, Jul (3), Sep and Nov (4).

**Fire Survival** (59 records): 51% survived by seedlings only, 24% eliminated from the area by fires, 24% escaped fires in fire-safe areas, 2% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 6-7 years, and 100% recorded at 8 years, with a decline after 21 years.



**Height** (704 records): 4% 0-0.2 m tall, 79% 0.2-1 m tall, 16% 1-2 m tall, 0.6% 2-5 m tall.

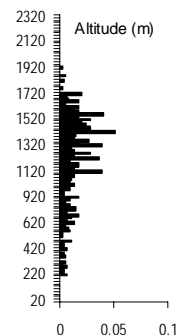
**Pollinators** (4 records): 100% birds.

**Detailed Pollinators** (4 records): Cape Sugarbird (3), Great Protea Beetle.

#### Habitat:

**Distance to Ocean** (647 records): 100% inland - further than 2 km from coast.

**Altitude** (647 records): 200 - 2000 m; 980 *lq* - 1220 *med* - 1360 *uq*m.

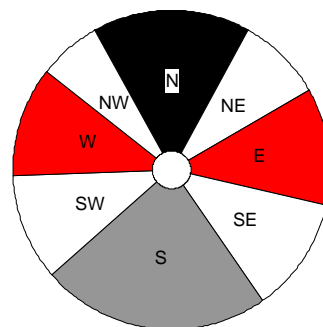


**Landform** (641 records): 56% deep soil, 33% shallow soil, 10% rocky outcrops.

**Slope** (643 records): 60% steep incline,

24% gentle incline, 10% hill top, 5% cliff, 1% platform.

**Aspect** (577 records): 37% South, 24% North, 20% West, 19% East.



**Soil Type** (637 records): 39% sandy, 33% loamy, 10% peaty, 10% rocky, 5% gravelly, 3% clayey.

**Soil Colour** (632 records): 52% grey, 26% brown, 19% black, 2% white, 1% orange.

**Geology** (628 records): 88% sandstone, 8% shale, 4% granite.

**Vegetation** (637 records): 95% shrubland, 2% grassland, 2% plantations.

**Conservation Status and Threat:****Red Data List Status:** Near Threatened

B1a(i)c(iv)+2a(i)c(iv).

Occurrence (Fynbos): 17 750 km<sup>2</sup> with 29% conserved and 18% lost; Occupancy: 653 km<sup>2</sup> with 60% conserved and 4% lost. Fragmentation index: 2%.**Nature Reserves** (647 records): 74% in nature reserves - well conserved.**Habitat destruction** (631 records):

95% extensive natural habitat, 3% naturally linear habitats, 1% islands.

**Alien Invasive Species** (621 records):59% none, 34% *Pinus*, 5% *Hakea*, 1% Fabaceae (chiefly alien *Acacia*).**Alien Density** (621 records): 59% alien-free, 33% sparse, 6% abundant, 1% dense.**Cultivation & Utilization:****Picking** (457 records): 98% no sign of picking, 0.9% lightly picked, 0.7% severely picked.**Cultivation Status:** Plantings - 65 records (9%), Escapes - 4 records (0.5%).**Witch's Broom Infestation:** 1 record (0.1%).**Atlassers Notes:****Table Mountain**

The plants (Richard Buchanan's find at the edge of the Left Face escarpment) has four good buds; the first sign of flowering for about 7 years (PVR97010401);

On ridge between top of Newlands Ravine &amp; Dark Gorge Mature bushes the bigger one over 2m in diam and with trunk 8cm diam growing next to each other - older than the Saddle specimens and not likely to have been planted! (WIJ94010806);

All 25 specimens nearby path and well spaced on Saddle; This is probably the area planted by C.C.C. (AKS92090601); Planted along path on saddle (WIJ99041703);

A few pale creamy white variants were noticed all others were bright pink (CSS97123109); Remaining live specimen of group killed by fire growing in rock outcrops in flat area above Appelskop ridge (DJI94030901); Some specimen surviving old fire (DJI94091501); Impressive large stand of burnt parent and young plants (MAJ93062202);

Single plant in rock cliff (OUT97062104); Only One old plant destroyed by fire on 1991 05 18 (SJJ92042301)

Lots of cones eaten by mice (ACU99060801);

A big spider used one plants new growth to make a home (AWA97031301); Spiders seem to love the crowns! spider laid a new batch of eggs [and small flower bud aborted] (AWA97120401); Spider found in leaves surrounding new bud - looks like a member of family Loxoscelidae (WEL94030508);

Green caterpillar eating leaves (CHE96080703); A cockroach (Blattodea) was seen eating pollen presenters &amp; perianth (CSS97123108);

Looking unhealthy - fawn patches on leaves (CHE96080703); Leaves badly damage by something - hail or a disease? (LYM98092501); Heavily impacted by a fungus in 95 now recovering after dropping old leaves (NAH97011301); Not happy with lots of brown leaves (NGF98100204); Nearly all looked blighted - leaves mottled brown (SMR98092501); The most scruffy plants i have ever seen: looks like a type of plant leprosy and mange infection, no bugs or goggas to blame -so could be some atomic fall out which has burnt and dried out the leaves or more likely hail damage a few weeks earlier (VJK98092501);

2 dead plants - moribund - need fire! (AGRY0060409); Skeletons only seen (AGRY1032108); A few dead plants seen (AGRY2010514); All appear to be dying (DFJ99080801); In very poor dying condition (DFJ99080803); Was dead (DJI94060201); Few plants dead most others with many dead leaves at top of plants but still some new growth - but they look sick (OUT96110904); Very stressed (WMP98092603, WMPY0110408);

In Saddle to Winterhoek Peak - confined to there - mutually exclusive with *P. rupicola* none near one another! (AGRY5100110);

Scattered among restios not only in rocky outcrops (JBB94010502); In rocky outcrop (PMR99100302);

**Confusing Species:** Misidentified with *P. magnifica*, *P. laurifolia*, *P. nitida*, *P. stokoei*, and *P. speciosa*, but differs in having rounded leaves. On Table mountain frequently mistaken for *P. speciosa*, but the latter is a resprouter.

Records of identification queries = 22.

Records of corrected identification queries = 11.

**Variation and Taxonomy:** Populations vary in size of flowerheads and intensity of colours. Variation in beard colour ranges from white, to deep maroon from the coastal ranges (Langeberg to Tzitzikamma and Cockscomb). Unlike most other proteas, flowering season is labile and changes if plants are grown under cultivation.**Distribution:** Add.

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*Protea holosericea* (Salisb. ex Kn.) Rourke 1809, 1974  
**Sawedge Sugarbush**

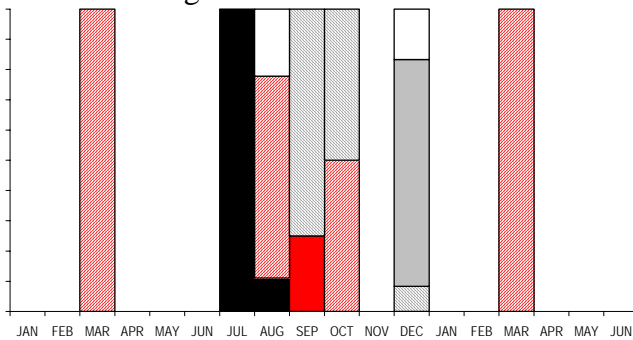
**Other Common Names:** Velvety Erodendrum.  
**Other Scientific Names:** *patens* RBr 1810.

**33 Records**

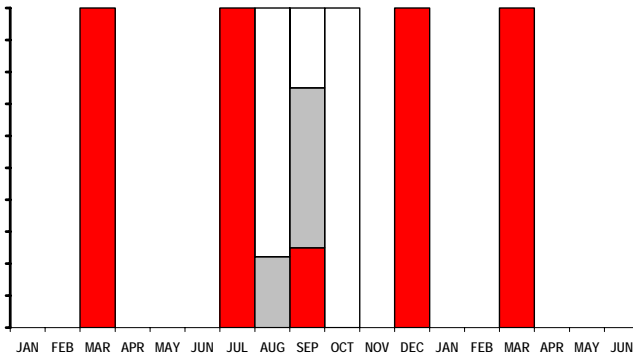
**Population** (32 records): 25% Common, 53% Frequent, 22% Rare.

**Dispersion** (29 records): 52% variable, 38% clumped, 10% evenly distributed.

**Flowering** (30 records with: Jan 0, Feb 0, Mar 2, Apr 0, May 0, Jun 0, Jul 1, Aug 9, Sep 4, Oct 2, Nov 0, Dec 12): Buds from Mar, Aug and Oct; Flowering from Sep; Peak Flowering from Jul; Over from Sep to Oct; Fruit from Dec; Nothing from Aug. Peak levels unreliable. Historically no records as to flowering.



**Growth** (29 records with: Jan 0, Feb 0, Mar 1, Apr 0, May 0, Jun 0, Jul 1, Aug 9, Sep 4, Oct 2, Nov 0, Dec 12): Much from Dec to Jul and Sep; Rare from Aug to Sep; None from Aug to Oct. Peak levels unreliable at 100% in Dec.



**Seedlings** (17 records): Absent in 76%: fewer seedlings than prefire adults in 2 cases. Seedlings found in Aug and Sep.

**Fire Survival** (2 records): 50% eliminated from the area by fires, 50% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 6 years.



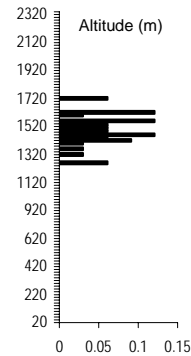
**Height** (32 records): 3% 0-0.2 m tall, 97% 0.2-1 m tall.

**Pollinators** (3 records): 100% mammals.  
**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (33 records): 100% inland - further than 2 km from coast.

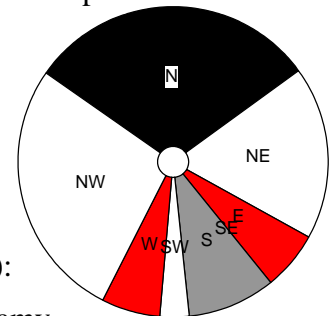
**Altitude** (33 records): 1140 - 1620 m; 1320 *lq* - 1380 *med* - 1440 *uq* m.



**Landform** (33 records): 67% shallow soil, 18% deep soil, 15% rocky outcrops.

**Slope** (33 records): 67% steep incline, 18% gentle incline, 9% cliff, 6% hill top.

**Aspect** (33 records): 61% North, 15% East, 14% West, 11% South.



**Soil Type** (33 records): 48% sandy, 39% rocky, 12% loamy.

**Soil Colour** (33 records): 73% grey, 21% brown, 6% yellow.

**Geology** (33 records): 100% sandstone.

**Vegetation** (33 records): 97% shrubland, 3% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Endangered  
 B1a(ii)c(iv)+2a(ii)c(iv).

**Occurrence** (Fynbos): 15 km<sup>2</sup> with 29% conserved and 0% lost; **Occupancy:** 20 km<sup>2</sup> with 34% conserved and 0% lost. Fragmentation index meaningless.

**Nature Reserves** (33 records): 24% in nature reserves.

**Habitat destruction** (32 records): 94% extensive natural habitat, 3% islands, 3% naturally linear habitats.

**Alien Invasive Species** (29 records): 100% none.

**Alien Density** (29 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (23 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 2 records (6%).

**Atlassers Notes:**

Occ dead (AMM99120703); Some plants were dead a few young plants seen (LYM99101905); Found many old & young plants - does not look endangered! Plants look healthy found some large adults plants which looked as if they died from old age (SSA92081601); Grew here but no seedlings seen even after 4 years (WMS92091703); Over 400 plants in plot (AGR99120714); I would estimate that there are a few hundred plants at this burned population a few adults plants in the rocks haven't burned (WMS93092301); Rodents pollinating (LSA92072901); It looks as if seed being eaten by rodents many heads nibbled seed cannot be spread by wind mouse droppings at flowerheads (SSA92081601); Seedheads all off - mice eating seeds; (WMS92091701) In narrow belt in the middle of this plot extending N and S at same altitude as far as can be seen ( belt 30-80m Wide) (AGR99120709); Another population on the E side of Blomfontein Kloof was burnt out about 4 years ago - Numerous seedlings were

seen but unable to ID Positively - This population is on the farm Paardekloof47 populations are 300-500m apart separated by the kloof (LSA92072901) All plants growing amongst rocks (LYM99101905); Fussy about its climate - restricted habitat (SSA92081601); Growing / sprawling over rock - growing along ridge of Sawedge Peak (WMP94092503); 1 plant had witches broom (LYM99101905);

**Confusing Species:** Easily confused with *P. magnifica* when not flowering, but the two species do not coexist.

Records of identification queries = 2.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** None noted.

**Distribution:** Add.

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*Protea laurifolia* Thunb. 1781

**Grey-leaf Sugarbush**

*Louriersuikerbos*

**Other Common Names:** August Erodendrum, Fringed Sugarbush, Laurel Sugarbush, Laurel-leaf Sugarbush, Pastel Protea, Rose-mink Protea, *Lorbeerblattriger Zuckerbusch*, *Blousuikerbos*, *Lourierblaarsuikerbos*, *Luisgat*, *Suikerbos*, *Suikerkan*.

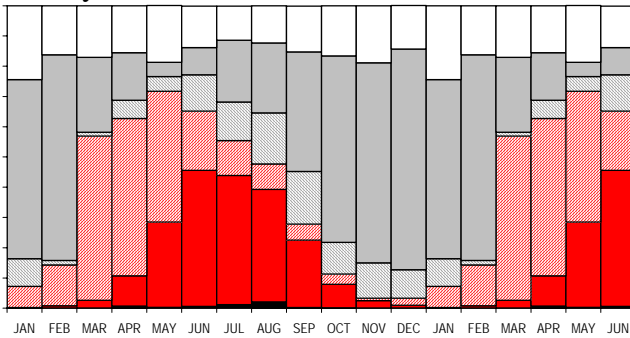
**Other Scientific Names:** *angustum* Salisb. ex Knight 1809, *comigera* Stapf 1912, *marginatus* Thunb 1781.

**11 090 Records**

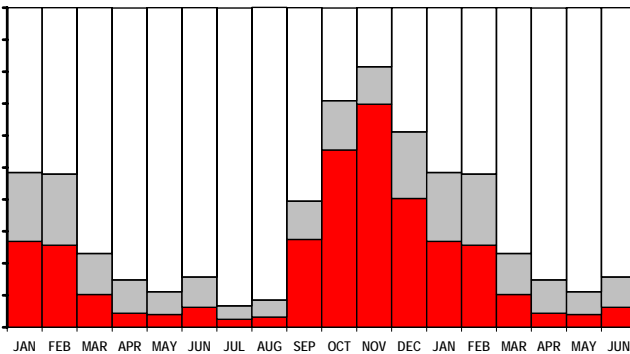
**Population** (10 955 records): 33% Common, 51% Frequent, 15% Rare.

**Dispersion** (10 059 records): 80% variable, 13% clumped, 5% widespread, 0.7% evenly distributed.

**Flowering** (10 778 records with: Jan 500, Feb 754, Mar 1146, Apr 907, May 688, Jun 789, Jul 485, Aug 1352, Sep 1070, Oct 1259, Nov 1306, Dec 522): Buds from Mar to Jun; Flowering from May to Sep; Peak Flowering and Over not significant; Fruit from Jul to Mar; Nothing from Jan. Peak levels at 77% in Jun. Historically recorded as flowering from Apr to Nov, with a main period from May to Jul.



**Growth** (10 729 records with: Jan 498, Feb 760, Mar 1149, Apr 900, May 678, Jun 776, Jul 474, Aug 1331, Sep 1069, Oct 1257, Nov 1313, Dec 524): Much from Sep to Feb; Rare from Dec to Feb; None from Dec to Oct. Peak levels at 82% in Nov.

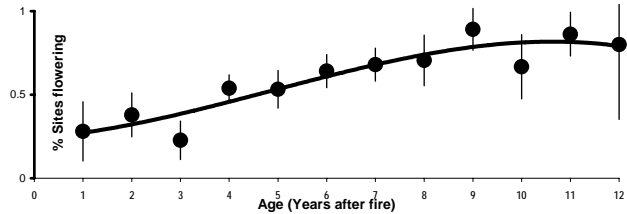


**Seedlings** (4391 records): Absent in 91%: fewer seedlings than prefire adults in 112 cases, and more in 80 cases. Seedlings found in Jan (31), Feb (2), Mar (19), Apr (7), May (3),

Jun (15), Jul (11), Aug (27), Sep (16), Oct (14), Nov (33) and Dec (14).

**Fire Survival** (711 records): 57% survived by seedlings only, 29% escaped fires in fire-safe areas, 9% eliminated from the area by fires, 5% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4 years, and 100% recorded at 14 years.



**Height** (10 940 records): 2% 0-0.2 m tall, 18% 0.2-1 m tall, 40% 1-2 m tall, 39% 2-5 m tall, 1% taller than 5 m.

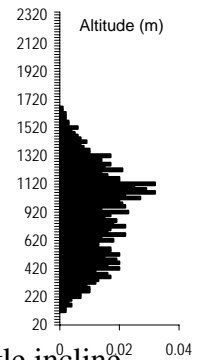
**Pollinators** (286 records): 82% birds, 11% beetles, 3% bees or wasps, 2% mites, 0.3% wind, 0.3% mammals, 0.3% none observed.

**Detailed Pollinators** (266 records): Cape Sugarbird (159), Orange-breasted Sunbird (49), Malachite Sunbird (26), Monkey Beetle (7), Great Protea Beetle (7), Honey Bee (6), Protea Itch Mite (3), Protea Rove Beetle (2), Moth (unspecified) (2), Thrip, Southern Double-collared Sunbird, Flower Beetle, Carpenter Bee, Amethyst Sunbird.

**Habitat:**

**Distance to Ocean** (10 910 records): 100% inland - further than 2 km from coast.

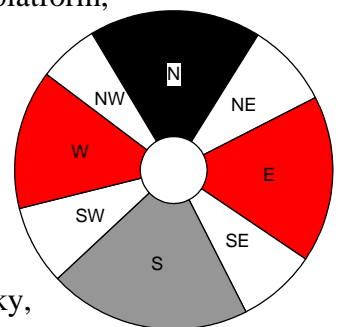
**Altitude** (10910 records): 40 - 1920 m; 520<sub>lq</sub> - 820<sub>med</sub> - 1000<sub>uq</sub>m.



**Landform** (10854 records): 68% deep soil, 28% shallow soil, 4% rocky outcrops, 0.7% riverine, 0.1% swamp.

**Slope** (10844 records): 54% gentle incline, 27% steep incline, 9% platform, 6% hill top, 3% valley bottom.

**Aspect** (9457 records): 29% South, 25% East, 25% North, 21% West.



**Soil Type** (10 786 records): 53% sandy, 21% loamy, 12% gravelly, 10% rocky, 3% clayey.

**Soil Colour** (10 733 records): 43% brown, 30% grey, 7% orange, 7% yellow, 7% white, 3% red, 2% black.

**Geology** (10 494 records): 81% sandstone, 12% shale, 4% granite, 1% Tertiary sands, 1% silcrete or ferricrete.

**Vegetation** (10 849 records): 98% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 19 777 km<sup>2</sup> with 16% conserved and 20% lost; Occupancy: 7 941 km<sup>2</sup> with 22% conserved and 13% lost. Fragmentation index: 18%.

**Nature Reserves** (10910 records): 26% in nature reserves.

**Habitat destruction** (10712 records): 86% extensive natural habitat, 9% islands, 2% naturally linear habitats, 1% naturally fragmented habitats.

**Alien Invasive Species** (10566 records): 66% none, 15% *Pinus*, 8% Fabaceae (chiefly alien *Acacia*), 8% *Hakea*, 2% Myrtaceae.

**Alien Density** (10541 records): 67% alien-free, 27% sparse, 5% abundant, 1% dense.

**Cultivation & Utilization:**

**Picking** (7569 records): 98% no sign of picking, 1% lightly picked, 0.4% severely picked.

**Cultivation Status:** Plantings - 62 records (0.6%), Augmentations - 1 record (0.01%), Escapes - 14 records (0.1%).

**Witch's Broom Infestation:** 339 records (3%).

**Atlassers Notes:**

**Green versus glaucous**

Green leaf and silver leaf forms! (AGR96052401,02,05); Isolated island population with 24 glaucous puberulous leaved plants and 12 green glabrous leaved plants (EGH94082602);

**Transitions to *P. nerifolia***

Some *neri* features (AGR95011501); Leaf very variable - some approaching *neri* (AGR97060101); Narrow *nerifolia*-like leaves (AGRY1011709); An intermediate population - ID problematic - plants lower down and fewer are more *laurifolia*-like (AGRY1111206); Intermediate with *neri* (AGRY6022201); *Laur-neri* problem again (AGRY6022202-3); With many *neri* features! (ASP93082206); Look like *neri* (JIDY1011715); Beginning to look like *neri* (LYM97103009+10); Intermediate form with *neri* in this area - but has more *laur* characters (NAH96030102); Some plants looked rather like *neri* (NGF98011805); Difficult to distinguish with *neri* - no petiole but elliptic grey green leaves (PMRY1032301); Leaves somewhat more *neri* than *laur* (SMRY1011713);

**Other variation**

Leaf length 130x40mm (MBO92111001); With very wide leaves and growth form approaching *P. magnifica* (AGR92021301); Heads exceptionally large - could there be some *P. grandiceps* hybridization (is planted a few km away) or is this an exceptional form? (AGRY5100206);

**Flowering**

Second flowering this season (VCH99080801+3);

**Damage**

Lots of baboon damage (AGR92082702, AGR92082901); Lots of baboon damage - branches broken (AGR92082905); Occasionally vandalized [or picked for nectar] by baboons flower heads were strewn around (AKS92080101); Picking - by baboon - dead flowerheads on the ground (HCE96070402+3); Baboon damage to flowerheads (LYM98062705); Marked damage to plants in form of broken branches - baboons (MAJ92020202); Picking by baboon! (MEB93083101); Flowerheads picked by baboons (OGM98041301+2); Baboons picking heads - numerous broken heads lying all over the place - broken open (WEL94080601);

Many broken twigs (JAT93013001);

Strange- all branches below 1m broken off (for grazing or firewood?) (AGR97051704);

Most lower branches broken down (AGR97051705); Branches broken by ?animals (WMP99042503);

**Grazing**

Signs of grazing (LYM96072401); Heavily grazed (SMRY0021102);

**Visitors**

One old bush with 300mm diam stem lots of ants milking waxy scale insects : not happy! (AGR93030608);

Nearly all plants were disfigured by moths - leaves skeletonized and stuck together with brown deposits (SMRY2090502); Almost all plants attacked by insects eating leaves - brown track mark (VCH98123101);

Ladybirds hibernating in old cones (VCH98121702);

Mistletoe on stem (CWRY0060501);

Branches covered with lichen and "Old Man's Beard" (WIJ98082009);

**Harvesting**

Dead plants being removed for firewood in burned area - heavy use (AGR99032605); Harvested for firewood - only a few plants (AGRY1022126); Lots of dead and dying plants taken for firewood (AGRY1022506); Chopped for fire wood (AMMY0030904+8); Picking for firewood (DJL97100110, VCH99060905); Many mature plants killed in the previous fire - someone had cut up the dead trunks and taken them away (NGF96060106); Cut down and left to dry and then removed for firewood (AGRY5122909-10); Hacked in places (APE92071604); Some of the plants had been chopped down (LYMY0030911); Some of the big ones were chopped down apparently for firewood (SMRY0030904); Many trees chopped down for firewood (VCH99042503);

According to Pagel Dippenaar there were previously lots of plants at this locality but they were cut for firewood! (IEB99102701); All But Destroyed! - Chopped for firewood (VCH98121707); Inhabitants of Eselbank chopping down for firewood - passed loaded bakkie (VJKY0092302);

Picking was not severe on any plant but added up to a vast quantity (SMRY0041205)

**Growth**

These plants are in a dry streambed; they are the only ones on active new growth

(AKS95111505); Only young plants have new growth (AWA98083002);

### **Population size class distribution**

With a variety of smaller bushes - not all the same age (AGR92082510); 2 cohorts: Hc 2 and Hc 4 (AGRY4031106); In all sizes cannot say which is majority (AWA98091002); Very old vegetation with largest plants 7-8m tall with > 30 heads: average height 2-5m (EGH92070202); Average height 2 because of many young plants present in Plot (FBH95103103); A few up to hc 3 but mostly young plants (JAT96040502); Big plants survived the fire (JNY0033001); Some plants had escaped the fire in small patches (LYM97052805); A few were very old plants (LYM99060910); Some very big hc 4 present but most were young plants (LYM97051805); About 20% of the plants - those in the river bottom - have survived the fire although the lower trunks have been severely burnt (PVR92010402); Survived the fire by being in a small stream (PVR96082803); The fire last here was apparently much gentler here - the plants in general have not been killed (PVR90010802); With many adult escapes and many saplings (SGAY1020617); Poor recruitment but *P. nitida* had very good recruitment (SGAY1022001); More seedlings than dead adults (SGAY1022102); Common before fire but poor recruitment; some adults escaped fire (SGAY1022106); Some escaped fire (SGAY1022109); Appears to have survived repeated fires (SHR95011403); Some height 5 some height 2 (SMR97100101); A clump ht 4 in flower & common ht 2 (SMR99092906); Young plants height 2 mostly & a few batches of height 4 that escaped in rocky places (SMR99012710); Also many escaped (WIJ97081005); A few escaped (WIJ97081012); Some escaped (WIJ97081013); Many of the plants survived the fire (WMS94122102); There was an interesting mix of ages - good stand of height class 4 and also hc 2! (WMP96112402)

### **Recruitment**

Only skeletons seen (AGR95112621, AGRY0122104); All dead no signs of any seedlings noted (IEBY0062203); No young seen (AGR96052512); Lots fewer young than skeletons (AGR93071708+15+19); Very few seedlings compared to dead adults - most plants are in rocks and have escaped (AGRY1022006); Parent seedling ratio 20:1 (AGRY5122801); Given the number of skeletons around there was extremely poor recruitment (NGFY1021405); Found only 1 plant with young [against a rock] the others all dead with no young (AWA95082606); Originally there were far more than the small clump which survived the fire in a rock patch (PVR99040402); Many many times more than parents killed in big fire some years ago (AWA97090904); Zillions of plants [a weed!] (AWA98091003); A family planning drive would be in order! (AWA98091203); Passed a big plant with more than a hundred babies around it [close] and mother still look

healthy (AWA97090905); Some adult plants have piles of leaves etc next to it with as many as 20 youngsters around it (AWA95081802);

Very few young plants relative to adults (ratio 1:2) (AGR92051705); Very few seedlings compared to dead adults - most plants are in rocks and have escaped (AGRY1022006); Less babies than parents killed (AWA96082008); With the two year old fire adults got killed but many young ones came up. In the '98 fire [more than half of these young ones got killed [to the eye] but enough escaped to keep the population rolling! (AWA98091001); Many killed-no seedlings yet: looks as if they burned before they had seedheads (AWAY0102204); Too young when burnt more plants dead than seedlings. but in a patch without dead plants there are many seedlings with cotyledons (AWAY0102205); Double fire in large parts - most proteas eliminated only skeletons - but *P. laurifolia* and a few others with lot of young plants (AGRY4092405); 10 dead to 1 live ratio - mostly 8 years old 1 5m tall with mainly no flowers at time of fire (AGRY4092507);

### **Mortality**

All dead (AGRY0042803); Only dead plants Seen (AGRY0010101, AGRY0112315, AGRY2022005); Lots of dead plants (AGR97032002, AGRY0093029, AGRY2050215); Half dead (AGRY0112305); Dead (VCH99042404, WMP99013103); Young dead (WMP99042602); 8 seen live and 6 dead! (AGRY0012934); 80% Of plants dead -only SE bottom bit survives (AGRY0112322); Only 1 dead plant seen - recently died in renosterveld (AGRY0080904); Lots of dieback and dead plants (AGRY0092909); Lots of dieback lots of dead plants (AGRY0092920); Lots of dieback and some dead (AGRY0093008); Lots of dieback (AGRY0111116); Most plants are almost dead (AMMY0112106); Some die-back (PMRY0111103); Tip die-back frequent on young growth (SMR96121101); Many dying plants (CFRY0072101); 1/2 plants already dead (VCH98032505); Also dying (VCH99040402); Several plants dying of drought (WIJ94041308); Senescent (APE92120510); Senescent: 2 dead (AKS95111503); Lots dead and all senescent (AGRY3111815); 66% of plants dead - senescent! (AGRY4041706); Very lanky and tall, but with very, very few cones! (AGRY0112627); Old and stressed few flowers (AWA96082103);

### **Stress**

Experiencing water stress (SHRY0070901); Looked old - much branched - but stressed (SMR99060301); Large plants and small knee high rather stressed young plants (SMR99060909); Seedlings pre-dominantly red in color about 130-170mm high (KLE96071601); Aborted buds KLE96082901, VCH99042502);

Many sunburned (WIJY0102913);

**Distribution**

A portion of this plot was fenced off (less than half). all Proteaceae recorded were found inside and outside of fence other than *P. laurifolia* and *L. conocarpodendron* which were found behind the fence only (FRI99102901)

The most persistent protea as restios disappear (TLE97101115);

**Witches Broom**

Heavily infested (MHO93090301); Heavy (SMR99060303); Some bad! (AGR97051730); Abundant (NAH96110202); Much (AKS92110404, SMRY0050602, SMRY0072105) Extensive (DJL99022508); Prevalent (DJLY1021405); Heavy on some (SMR97100101); Many (SMR99092906, SMRY0030102, SMRY2090502); Some (LYM98011801, LYM99060910, NGF96050102-4, SMR96121101, SMR99060911); Several (SMR97031909); Occasional (SMRY0030908; SMRY0041205, SMRY0101902, SMRY1021403, SMRY2021508); Slight (SMR99051203); A little (JAT93013001; On a few (JAT96090703, NGF96060103);

Baby with devil on it! (AWA97090607); On several of the small ones (SMR99092401); Particularly young plants (WMP99042501);

Approx 40% of plants (LYM96050206); 2 plants (SMR96071901, SMR96082101); 1 plant (SMR96110702, TLE98111706, TLEY0022401);

Only on *P. Nitida* - not present on *P. laurifolia* (LYM98011804);

**Confusing Species:** By far the biggest difficulty is with *P. nerifolia* which appears to only differ reliably from *P. laurifolia* in leaf shape. However, populations from

Gordons Bay to Wemmershoek are somewhat intermediate in character, but definitely *P. laurifolia*. However populations from Villiersdorp are more variable, sometimes very closely approaching *P. nerifolia*. Possible hybrids occur in intermediate situations on the Riviersonderend Mountains. Ostensibly *P. laurifolia* always has a short petiole (at least 3mm long), but some populations contain the full spectrum from typical 8mm plus petiole to cuneate leaf bases without a stalk.

On the Peninsula this species was occasionally misidentified as *P. lepidocarpodendron* by those unaware that it has been planted.

Many transcription errors with *Leucadendron laurosum* were encountered. A few cases of *P. lorifolia* (with large, broad leaves) were noted. Many atlases were also caught off guard by hybridization with *P. burchellii* (from Bainskloof to Nuwekloof).

Records of identification queries = 137.

Records of corrected identification queries = 78.

**Variation and Taxonomy:** Some populations south of Bainskloof have a high proportion of green plants, although glaucous forms usually predominate on northern slopes and more arid areas. Correlated with this is a decline in stature from a single-stemmed tree habit to a much-branched shrub. Involucral bracts are usually dull silvery-pink, but occasionally creamy green and bright reddish-pink plants are encountered.

**Distribution:** Add.

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*Protea lepidocarpodendron* (L.)L. 1753, 1771

**Black-beard Sugarbush**

*Swarthaardsuikerbos*

**Other Common Names:** Black Sugarbush, Leopard Protea, *Baardsuikerbos*, *Basterblousuikerbos*, *Blousuikerbos*, *Bobbejaansuikerbos*, *Luiperdssuikerbos*, *Suikerbos*, *Suikerkan*, *Uibe*.

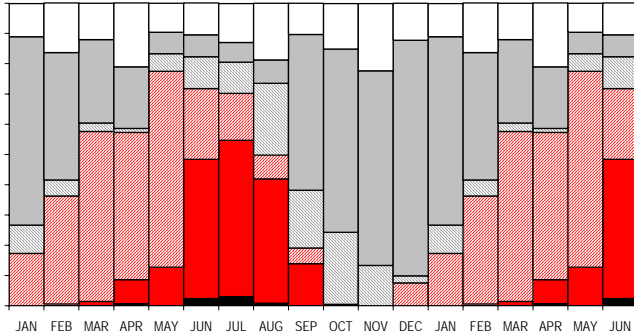
**Other Scientific Names:** *cristata* Lam 1791, *fulva* Tausch 1842, *lepidocarpon* RBr 1810, *melaleuca* RBr 1810, *neriifolium* (Salisb. ex Knight) 1809, *nigrita* DC ex Meisn 1856, *scabrida* Thunb 1803, *villosa* Bollw ex Meisn 1856.

**2091 Records**

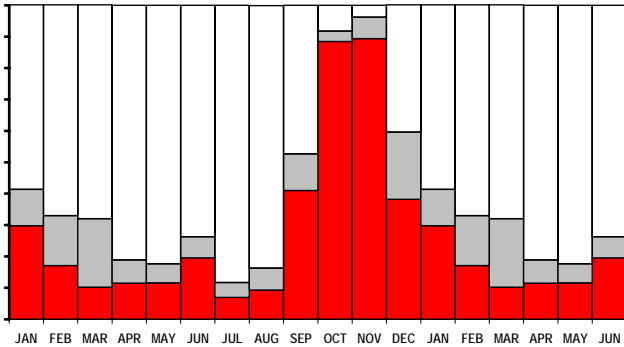
**Population** (2060 records): 3% Abundant, 40% Common, 45% Frequent, 12% Rare.

**Dispersion** (1896 records): 68% variable, 22% clumped, 9% widespread, 1% evenly distributed.

**Flowering** (2043 records with: Jan 127, Feb 171, Mar 217, Apr 152, May 156, Jun 124, Jul 232, Aug 219, Sep 194, Oct 185, Nov 135, Dec 131): Buds from Feb to Jun; Flowering from Jun to Aug; Peak Flowering not significant; Over from Aug to Oct; Fruit from Sep to Apr; Nothing from Nov. Peak levels at 83% in May. Historically recorded as flowering from Apr to Aug, with a Jun peak.



**Growth** (1981 records with: Jan 121, Feb 170, Mar 216, Apr 148, May 147, Jun 118, Jul 213, Aug 214, Sep 188, Oct 183, Nov 132, Dec 131): Much from Sep to Jan; Rare from Mar and Dec; None from Dec to Sep. Peak levels at 96% in Nov.

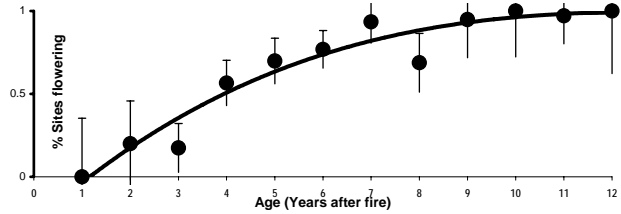


**Seedlings** (723 records): Absent in 83%: fewer seedlings than prefire adults in 24 cases, and more in 36 cases. Seedlings found in Jan (4),

Feb, Mar (2), Apr, May (4), Jun, Jul (13), Aug (6), Sep (5), Oct (8), Nov (11) and Dec (4).

**Fire Survival** (140 records): 74% survived by seedlings only, 15% eliminated from the area by fires, 9% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 10 years.



**Height** (2064 records): 4% 0-0.2 m tall, 34% 0.2-1 m tall, 53% 1-2 m tall, 9% 2-5 m tall.

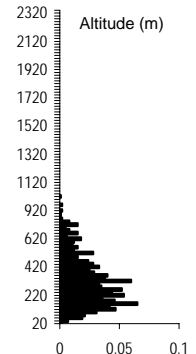
**Pollinators** (59 records): 76% birds, 17% beetles, 2% butterflies or moths, 2% bees or wasps, 2% flies, 2% mites.

**Detailed Pollinators** (54 records): Cape Sugarbird (29), Orange-breasted Sunbird (18), Monkey Beetle (2), Scarab Beetle, Protea Rove Beetle, Malachite Sunbird, Honey Bee, Great Protea Beetle.

**Habitat:**

**Distance to Ocean** (1965 records): 57% coastal - less than 2 km from coast.

**Altitude** (1965 records): 20 - 920 m; 160 *lq* - 260 *med* - 360 *uq*m.



**Landform** (1962 records): 74% deep soil, 17% shallow soil, 9% rocky outcrops.

**Slope** (1959 records): 46% gentle incline, 45% steep incline, 4% platform, 3% hill top, 1% cliff.

**Aspect** (1851 records): 33% South, 26% West, 21% East, 20% North.

**Soil Type** (1952 records):

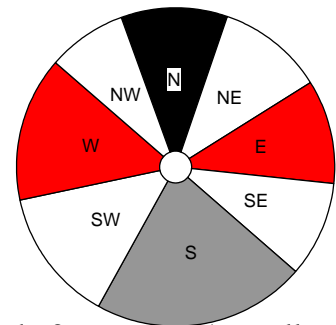
73% sandy, 14% loamy, 8% gravelly, 3% rocky, 3% clayey.

**Soil Colour** (1943 records):

53% grey, 32% brown, 6% white, 4% black, 3% orange, 1% yellow.

**Geology** (1933 records): 84% sandstone, 8% shale, 5% granite, 3% silcrete or ferricrete.

**Vegetation** (1960 records): 99% shrubland.





**Conservation Status and Threat:****Red Data List Status:** Near Threatened A4e.Occurrence (Fynbos): 1 892 km<sup>2</sup> with 29% conserved and 37% lost; Occupancy: 556 km<sup>2</sup> with 55% conserved and 19% lost. Fragmentation index: 15%.**Nature Reserves** (1965 records): 82% in nature reserves - well conserved.**Habitat destruction** (1933 records):

96% extensive natural habitat, 2% islands, 1% naturally linear habitats.

**Alien Invasive Species** (1914 records):42% none, 25% Fabaceae (chiefly alien *Acacia*), 23% *Pinus*, 7% *Hakea*, 2% Myrtaceae.**Alien Density** (1907 records): 42% alien-free, 44% sparse, 11% abundant, 2% dense.**Cultivation & Utilization:****Picking** (1123 records): 100% no sign of picking, 0.1% severely picked.**Cultivation Status:** Plantings - 18 records (0.9%), Augmentations - 1 records (0.05%), Escapes - 2 records (0.10%).**Witch's Broom Infestation:** 135 records (6%).**Atlassers Notes:****Mortality and regeneration**

Most plants (about 20 excl live) dead - too old and fallen apart. No young - burn needed! (AGR99041105); Becoming very senescent - much dead wood around needs a fire badly (NAH92050901); Some plants senescent, some dead plants, some young seen (TLE94061206);

No seedlings observable yet following the fire in March? 1995 (PVR95052405); Note much greater success of seedling compared to Die Boer area (TLE94070505); Seedlings not found despite looking surely not too early - should be obvious! Was fire too early? (AGR96081802);

The seedlings were both first and second season (PVR91091101);

Only skeletons seen (AGRY0102002); Only dead seen (AGRY1052702);

Many dead - also many young plants (AKS93042105); 15 burnt adults but only could find no more than 4 young (NSC94090703);

Looking stumped and stressed (WMP99100903);

**Variation**

With brown beard (AKS93100702);

**Diseases**

New growth showed leafcurl-like growth making leaves very Hairy (LYM97030908); Galls (PVR94072807);

There was some growth on the stems of a few plants (PVR94112304);

**Witches Broom**

Severe infestation (FBH96071001-3); Heavily infested (LKAY0082402);

Virtually All (TLEY1010603); Almost all (TLEY0031203); Quite common (TLEY0111102); Much (AKS93081202, LYM94110502); Many (CVV95070602-3); Some (AKS92102203, AKS93100601, CJL98062501, CVV96082911, FBH96072801, TLE96092209, TLE97030801+3+9, TLE97100402, TLE99051601); Only a few (CVV96102502); On 3 or 4 bushes (SMR96050201); 4 plants (TLE96070602, TLE99010503); 3 plants (TLE98030106, TLE99122702); 2 plants (TLE96070603); 1 case (TLE97083113, TLE98030105, TLE99122704, TLEY0022001)

On approx 10% of plants (HCE96070906);

On about 100 young plants (AKS92102207);

Seems to be on younger plants (about 3 years old) only - well established older plants not infected (FBH96072803);

3 seen on young plants at 150mm above ground (AKS92080601); One at 1m from ground (AKS92080804); 2 clumps about 30cm above ground (AKS92081202);

Plant 3m high about 15yrs old dying of multiple infestation - showing on nearly every growing point other mature plants nearby show similar but not so extensive infestation (AKS92081208);

Affecting about 15% of the population (of about 500 plants) along the side of a stream - noticed it was always at the tips of the plants (with some flowers growing up through it occasionally) (HCE96070904); On 1 patch on streambank - about 25% of about 500 plants affected (HCE96070905);

21 out of 23 in clump - a large increase since 990105 (TLE99121803);

Especially around the base of the old flowerheads (WIJY0042803);

**Confusing Species:** Easily and readily confuse with *P. neriifolia*, despite being quite distinctive with its two tone bracts, strongly incurved inner involucre bracts and black upper hairs below the beard. Less frequently confused with *P. laurifolia*, which has quite different, elliptical, grey leaves.

Records of identification queries = 117.

Records of corrected identification queries = 91.

**Variation and Taxonomy:** Cream or greenish-yellow involucre bracts are most common, but pink forms may occur, and dominate the populations at Kleinmond and Hermanus.**Distribution:** Add.

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*Protea lorifolia* (Salisb. ex Kn.) Fourc. 1809, 1932

**Strap-leaf Sugarbush**

*Riemblaarsuikerbos*

**Other Common Names:** Ass's Ears, Long-leaf Protea, Macrophylla, Pink-amber Protea, Thong-leaf Erodendrum, *Eselstore*, *Haasoresuikerkan*, *Langblaar*.

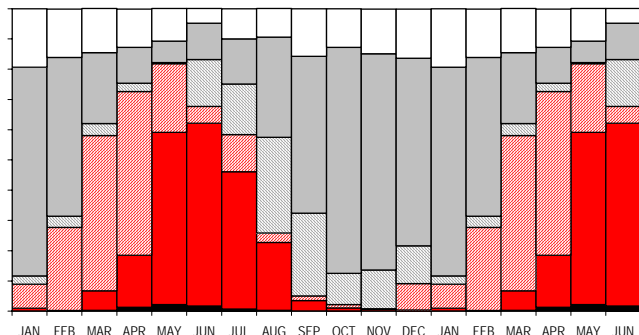
**Other Scientific Names:** *macrophylla* RBr 1810.

**5320 Records**

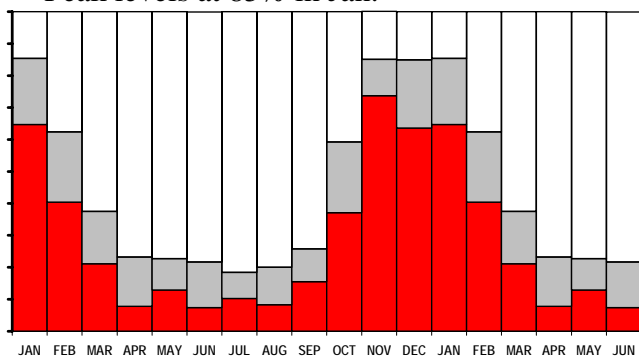
**Population** (5255 records): 26% Common, 59% Frequent, 14% Rare.

**Dispersion** (4856 records): 68% variable, 18% clumped, 12% widespread, 2% evenly distributed.

**Flowering** (5153 records with: Jan 290, Feb 432, Mar 362, Apr 534, May 269, Jun 593, Jul 269, Aug 357, Sep 453, Oct 825, Nov 506, Dec 263): Buds from Feb to May; Flowering from May to Aug; Peak Flowering not significant; Over from Aug to Sep; Fruit from Aug to Mar; Nothing from Jan. Peak levels at 83% in Jun. Historically recorded as flowering from Apr to Oct, at its peak Apr to Jun.



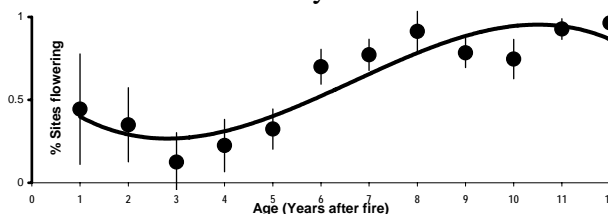
**Growth** (5071 records with: Jan 295, Feb 431, Mar 360, Apr 525, May 255, Jun 579, Jul 256, Aug 350, Sep 445, Oct 816, Nov 501, Dec 258): Much from Oct to Mar; Rare from Dec to Feb and Oct; None from Feb to Oct. Peak levels at 85% in Jan.



**Seedlings** (2161 records): Absent in 92%: fewer seedlings than prefire adults in 50 cases, and more in 38 cases. Seedlings found in Jan (3), Mar (10), Apr (6), May (4), Jun (16), Jul (10), Aug (5), Sep (6), Oct (16), Nov (3) and Dec (9).

**Fire Survival** (271 records): 58% survived by seedlings only, 27% escaped fires in fire-safe areas, 14% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 5-6 years, and 100% recorded at 14 years.



**Height** (5222 records): 4% 0-0.2 m tall, 51% 0.2-1 m tall, 41% 1-2 m tall, 5% 2-5 m tall, 0.2% taller than 5 m.

**Pollinators** (99 records): 75% birds, 17% bees or wasps, 8% beetles.

**Detailed Pollinators** (68 records): Cape Sugarbird (28), Orange-breasted Sunbird (27), Honey Bee (7), Malachite Sunbird (2), Solitary Bee, Scarab Beetle, Great Protea Beetle, Amethyst Sunbird.

**Habitat:**

**Distance to Ocean** (5240 records): 100% inland - further than 2 km from coast.

**Altitude** (5240 records): 100 - 2020 m; 860 *lq* - 1100 *med* - 1280 *uq*m.

**Landform** (5210 records):

59% shallow soil, 33% deep soil, 8% rocky outcrops.

**Slope** (5221 records): 48% steep incline, 39% gentle incline, 8% hill top, 3% cliff, 2% platform.

**Aspect** (4765 records): 46% South, 28% North, 14% East, 12% West.

**Soil Type** (5184 records):

44% sandy, 26% loamy, 18% rocky, 10% gravelly, 1% clayey.

**Soil Colour** (5165 records):

45% brown, 43% grey, 4% black, 3% orange, 2% yellow, 1% white.

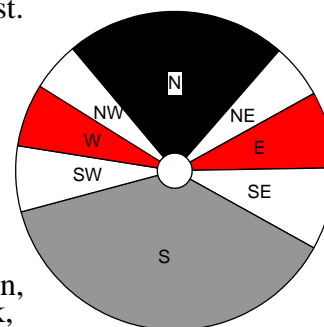
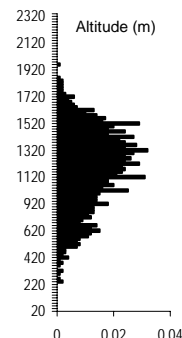
**Geology** (4989 records): 95% sandstone, 5% shale.

**Vegetation** (5221 records): 98% shrubland, 1% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 21 620 km<sup>2</sup> with 30% conserved and 8% lost; Occupancy: 4 200 km<sup>2</sup> with 37% conserved and 3% lost. Fragmentation index: 7%.



**Nature Reserves** (5240 records): 46% in nature reserves.

**Habitat destruction** (5094 records): 97% extensive natural habitat, 1% islands, 1% naturally linear habitats.

**Alien Invasive Species** (4972 records): 83% none, 8% *Hakea*, 6% *Pinus*, 2% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (4933 records): 84% alien-free, 15% sparse, 1% abundant.

### **Cultivation & Utilization:**

**Picking** (4042 records): 98% no sign of picking, 1% lightly picked, 0.4% severely picked.

**Cultivation Status:** Plantings - 29 records (0.5%), Escapes - 1 record (0.02%).

**Witch's Broom Infestation:** 22 records (0.4%).

### **Atlassers Notes:**

#### **Size**

One bush collapsed erect branches dead creeping branches growing : 6m diam. (AGR93030608);

Plus 1 dead skeleton of huge proportions (AGRY1013006); Very old plants on rock face - 1 shrub at base of face was about 2.5m tall (EGH94071402); Plants over 2.5m - young plants common less than a meter high (KEXY0081204); This is a small forest 4m high - never seen anything like it before (MCG99100301); 2 large plants - dead (SGAY0123104) Very old plants trunks nearly 200mm diam (WIJ96101003);

#### **Flowering**

There are a few nice buds although David's observation is that plants generally only bloom 7 yrs after fire (AWA96041101); At least 15 yrs old and many young plants nearing the flowering age (VJKY0051702);

#### **Variation**

Full range of flower colours white to deep pink (KEXY0081204); Both white and pink (KEXY0082603); Pink and cream (NOG93091001); White also present (MCG97081005);

#### **Baboon damage**

Baboon interference with flowers (LYM96060603); Baboon damage to flowers (LYM97051705, LYM99060305);

#### **Senescence**

They also appear to be long-lived and can tolerate (or are adopted to) a fire frequency of 40 plus years (DEB92102401); Very old & moribund (LYM99092901); Senescent veld with dead plants (RMC91120502);

#### **Regeneration**

No young seen - may be too early -but contrast with previous plot! - Lack of rains since Easter? (AGR96060513); Recovery of proteaceae not very good - many adults burnt young plants not as dense (JBB93122701); There was very poor regeneration despite there being many old skeletons very few seedlings were found (NGFY0030505); Obviously escaped the fire - but only 2 plants in a large area (OUTY1022402);

#### **Firewood**

Wood of the older plants may be collected for firewood (KEXY0122803); Being used for firewood (ROO94080801); Been cut on large

scale for firewood location ( Lyonville) close by could be the residents that are cutting this plant (GAC97022610);

#### **Recruitment**

Previous generation was 1.5x larger than current (AGRY1020211);

Failed to recruit at this altitude - lots of skeletons (ca 5-15 plants) (AGRY2041927); 1 single large plant had died but was surrounded by a ring of young plants of all about same age ( about3yrs old.) very pleasing! (DFJ99070903);

2 - 3 young plants per dead skeleton (SGAY0123004); Many dead adults but poor recruitment (SGAY0123009);

#### **Mortality**

60% dead - drought? (AGRY2102605); 60-70% plants dead - drought? (AGRY2102606);

Lots of dead plants (AGRY1012922); Most are dead ( why? old age or drought?)

(GEKY0101311); Many plants dying (OUT96100508-9); Die back (OUT99061203); Is drying out nearly dead (RDF95102901); About 30 % dieback (WMPY0032001);

Aborted buds (VCH99060602); Seedheads sterile (drought!) (VJK99060404);

#### **Habitat**

Slightly higher up where aspect becomes SSE are dense stands (AMA92090803);

Appears to tolerate hotter dryer condition found at lower altitudes - although usually restricted to steep S slopes when low down (300-600m). This is the lowest ( altitude) population I've seen (DEB92102401);

Mostly on TMS rockband it appears not to be serotinous (PMR91120301); In rocky outcrops (PMR99060502); Below and on rock band (WMP98061902);

Only in ravine where it is protected (AMMY2102503);

In this area mostly scattered single plants or clumped (OUTY0102802); Population very dense (VJK95122002);

#### **Witches Broom**

Few plants heavily infested (OUT96051101); Much (OUTY0102803); on a number (PVR96041602); On several (SMR98102311); On one (AWA96041702);

**Confusing Species:** Mainly mistaken for *P. laurifolia*, because of the confusion of names - not so easily mistaken for the species, similarly mistaken as being *P. lorea*. Identification errors when not in flower with *P. nitida* (a resprouter with smooth, grey leaves), *P. magnifica* (with leaves with a wavy margin), *P. neriifolia* (with much narrower leaves), and less understandably with *P. foliosa* (with cabbagey leaves) and *P. mundii* (with much smaller leaves and a different growth habit).

Records of identification queries = 62.

Records of corrected identification queries = 48.

**Variation and Taxonomy:** Two very distinct forms occur.

- Over most of the range the species is a small shrub 0.5-1m - rarely 2m - tall. This form has 70-100mm long flowerheads, creamy-beize bracts, purplish brown fringing hairs not forming a proper beard, and a cone of

purple-brown perianth awns protruding through the involucre bracts.

- In the Baviaanskloof to Humansdorp specimens are more tree-like, 2-3m - to 5m tall, with robust trunks to 400mm diam. The flowerheads are 100-130mm long, with the involucre bracts concealing the purple-brown cone of awns. Involucre bracts are

bright cream or pink, fringed with white hairs.

**Distribution:** Add.

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*Protea magnifica* Andr. 1803

**Queen Protea**

*Baardsuikerbos*

**Other Common Names:** Barbi, Barbiger, Bearded Sugarbush, Blackbeard Sugarbush, Giant-woolly-beard Sugarbush, Magnificent Erodendrum, Woolly-beard Sugarbush, *Haarbuschelprotea*, *Baardprotea*, *Koninginprotea*, *Suikerbosprotea*, *Wolbaardsuikerbos*, *Wolhaarsuikerbos*, *Queen Green*, *Queen Pink*.

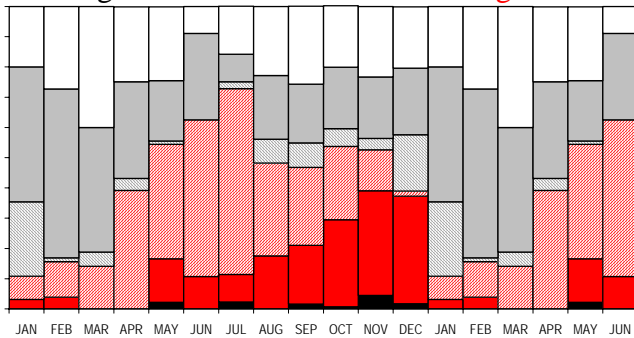
**Other Scientific Names:** *barbiger Meisn* 1856.

**1131 Records**

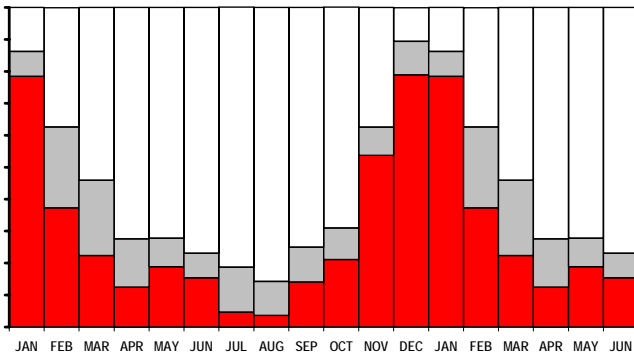
**Population** (985 records): 30% Common, 52% Frequent, 17% Rare, 1% Extinct.

**Dispersion** (889 records): 56% variable, 39% clumped, 4% widespread, 2% evenly distributed.

**Flowering** (1091 records with: Jan 65, Feb 77, Mar 85, Apr 153, May 90, Jun 56, Jul 44, Aug 114, Sep 62, Oct 153, Nov 133, Dec 59): Buds from Apr to Oct; Flowering from Sep to Dec; Peak Flowering not significant; Over from Dec to Jan; Fruit from Aug to Jun; Nothing from Aug to May. Peak levels at 75% in Jul. Historically recorded as flowering from Jun to Jan, commencing later at higher altitudes. [<check flowering>](#)



**Growth** (1083 records with: Jan 65, Feb 75, Mar 85, Apr 152, May 90, Jun 52, Jul 43, Aug 112, Sep 64, Oct 152, Nov 136, Dec 57): Much from Oct to Mar; Rare from Feb to Mar; None from Feb to Nov. Peak levels at 89% in Dec.

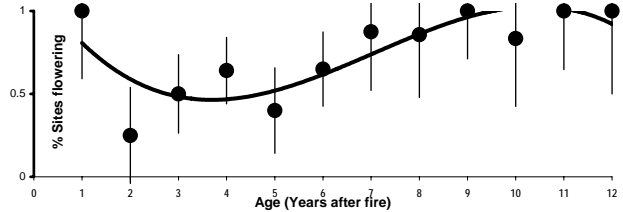


**Seedlings** (390 records): Absent in 89%; fewer seedlings than prefire adults in 14 cases, and more in 8 cases. Seedlings found in Jan (7),

Mar (2), Apr, May, Aug (2), Sep (4), Oct, Nov (3) and Dec.

**Fire Survival** (64 records): 44% survived by seedlings only, 39% escaped fires in fire-safe areas, 16% eliminated from the area by fires, 2% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-6 years, and 100% recorded at 9 years.



**Height** (1103 records): 4% 0-0.2 m tall, 78% 0.2-1 m tall, 18% 1-2 m tall, 0.7% 2-5 m tall.

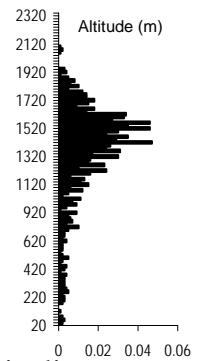
**Pollinators** (20 records): 60% birds, 25% beetles, 10% bees or wasps, 5% mites.

**Detailed Pollinators** (14 records): Cape Sugarbird (8), Orange-breasted Sunbird (3), Great Protea Beetle (2), Southern Double-collared Sunbird.

**Habitat:**

**Distance to Ocean** (967 records): 100% inland - further than 2 km from coast.

**Altitude** (967 records): 260 - 2000 m; 1200 *lq* - 1360 *med* - 1460 *uq*m.

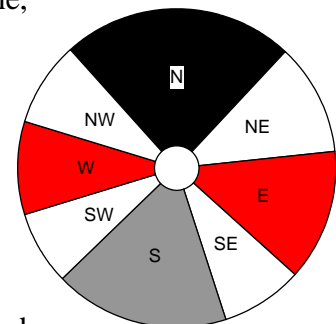


**Landform** (959 records): 57% shallow soil, 34% deep soil, 9% rocky outcrops, 0.2% swamp, 0.1% riverine.

**Slope** (956 records): 53% steep incline, 34% gentle incline,

9% hill top, 3% platform, 1% cliff.

**Aspect** (841 records): 35% North, 25% South, 23% East, 17% West.



**Soil Type** (950 records): 50% sandy, 26% rocky, 12% loamy, 11% gravelly.

**Soil Colour** (939 records): 58% grey, 29% brown, 5% white, 3% black, 2% yellow, 2% orange, 1.0% red.

**Geology** (949 records): 91% sandstone, 8% shale.

**Vegetation** (952 records): 99% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 15 622 km<sup>2</sup> with 22% conserved and 12% lost; Occupancy: 1 217 km<sup>2</sup> with 38% conserved and 2% lost. Fragmentation index: 3%.

**Nature Reserves** (967 records): 40% in nature reserves.

**Habitat destruction** (927 records): 95% extensive natural habitat, 2% naturally linear habitats, 2% islands.

**Alien Invasive Species** (917 records): 73% none, 21% *Pinus*, 4% *Hakea*.

**Alien Density** (917 records): 73% alien-free, 25% sparse, 2% abundant.

### **Cultivation & Utilization:**

**Picking** (712 records): 93% no sign of picking, 4% lightly picked, 3% severely picked.

**Cultivation Status:** Plantings - 130 records (11%), Augmentations - 4 records (0.4%), Escapes - 9 records (0.8%).

**Witch's Broom Infestation:** 20 records (2%).

### **Atlassers Notes:**

#### **Height**

Height varies from 300mm to 10m (EAH96010302); Height is also highly varied (NGW93072101);

#### **Flowering**

Still have not flowered 4.5 years after the fire burnt the parents (PVR96103106); The farmer says takes 12 years after fire to flower well enough for commercial picking (WIJY0040103);

#### **Variation**

White form (SHR91092109); Chocolate (TOW95101703)

#### **Recruitment**

Ratio adults:young = 20:90 (AGR91111607); Very good recruitment more young than dead skeletons (AGR95052411); Seedlings double the number of parents (AVZ93112501); 10-15 young for every skeleton (MURY2022002);

Catastrophic population collapse: lots of skeletons seen almost no young! 100: 1 ratio (AGRY4031207-8);

1 Patch on south side all plants dead and no young - on n slope many young - x3 adults (AGRY4110708);

Lots more skeletons than young - planted? Even old bushes which survived the fire have not flowered - is not happy here! (AGRY3112703);

#### **Fire survival**

Must have escaped fire as they are much older than 9 yrs (DOA93042204-5); A few plants on south side of large rock outcrop not burnt (EGH97123004); These plants escaped from the severe fire 2 weeks before - no sign of seedlings (NAH95012101); 10 adults escaped the fire only on uppermost 20m of the ridge (NAHY1071502); Occasional plants escaped the fire otherwise all dead (NAHY1072302); Plenty of young plants 1.5-2yr old - Some old plants had escaped the fire and had beautiful white blooms and buds - other plants had been completely burned (WMP93111405); Although the area has within last 2 yrs been burnt plants seem to have survived the fire in the rocky sites (WMP95010115);

#### **Stress**

In terrible condition (SMR99080701); Drought stress (WIJY0112609); Very stressed (WMP99032101); Stressed (WMP99040304 WMP99060511);

Particularly stressed and many dying off!!

However many did have lots of new growth on the tips and some had flowers or buds - Farmer reported very heavy rains in summer 1998? causing some disease and this winter has been the driest on record (WMPY0110401); Plants very stressed lots dead driest winter in recorded history very wet summer Dec 1998 (WMPY0110404); Very hairy leaves red margin petiole turned so that leaf edge is vertical (OUTY1020407);

#### **Mortality**

All dead - just a few (AGRY0112505); A few dead plants only seen (AGRY0112614); Only skeletons seen of planted plants (AGRY1011709); Previously many more plants At least 2 dead long search for more! (APE92101708); 100's of dead plants - mostly planted (WIJ99042507);

6 live plants 3 dead plants. very large not killed by fire possibly senescent.? (AKS92110402);

20% mortality of adults due to drought (NAH94040401); Many dead - drought related (WIJY0112606);

#### **Population numbers**

Few remaining (30 plants some partly burnt ) cause of concern (EAH95043001); 32 adult plants present ranging in age (EAH96010302); About 30 plants (PAT94123104); 20 young plants (VJK94100203);

#### **Habitat**

In rocky areas not on flats (AGRY4110610); Associated with rocky outcrops and screes on the north slopes not on the sandy flats (DEB93071803); On rocky edges (JBB98053103); On rocky area (JBB99121701);

#### **Witches Broom**

30% of plants (NAH96110204);

**Confusing Species:** Not easily confused with other species. Mistaken pre-flowering as *P. lorifolia* (with harder, flatter, parallel-sided leaves), *P. neriifolia* (with much narrower, flat leaves and *P. grandiceps* (with rounded flat leaves), but the wavy leaf margin and reddish/purple blush on new growth and under stress are quite distinctive.

Records of identification queries = 17.

Records of corrected identification queries = 3.

**Variation and Taxonomy:** A vary variable species – although atlassers were asked to note variation, this was not done the usual excuse being that it is too variable, and only really outrageous forms were noted. Growth habit may vary from sprawling, to creeping, to erect 3m (rarely bigger) tall plants. Small flowerheads occur in the Rivieronderend. Large heads in the Cedarberg. Involucral bract colour varies from: creamish green, cream, pink, salmon pink and deep carmine. Beard colour varies from white, black, purple-black or tawny brown, with the beard being prominent to almost absent. The cone of perianth awns varies from black to tawny brown to white. The shape of the flowerhead

is usually narrowly cylindrical to goblet shaped, but may be bowl-shaped as in the Cedarberg, where the involucre bracts splay open like the King Protea. A farmer on the Langeberg at Naudesberg maintains that three different forms occur together there and that there are no signs of intermediates or hybridization: if this is so, then several of

these local forms may warrant specific status.

**Distribution:** Add.

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*Protea neriifolia* R.Br. 1810  
**Narrow-leaf Sugarbush**  
*Blousuikerbos*

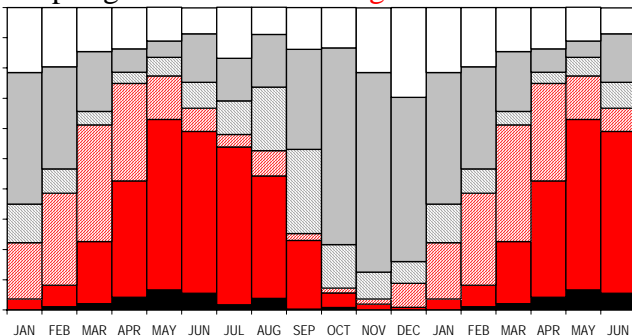
**Other Common Names:** Blackbeard Sugarbush, Blue Sugarbush, Mink Sugarbush, Neriifolia, Oleander-leaf Erodendrum, Oleander-leaf Sugarbush, Pinkmink Protea, Wagon Tree, White-mink Protea, *Baardprotea*, *Baardsuikerbos*, *Roosboom*, *Suikerbos*, *Swartbaardsuikerbos*, *Waboom*, *Cream Mink*, *Feathered Red*, *Frosted Fire*, *Green Velvet*, *Silk n Satin*.  
**Other Scientific Names:** *pulchella* Bellén <date>.

**6597 Records**

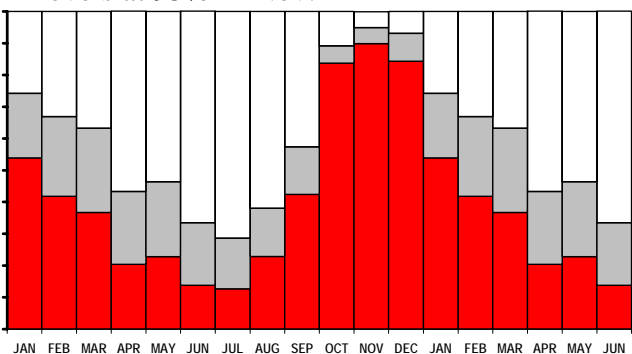
**Population** (6373 records): 3% Abundant, 36% Common, 49% Frequent, 13% Rare.

**Dispersion** (5906 records): 60% variable, 25% clumped, 11% widespread, 3% evenly distributed.

**Flowering** (6444 records with: Jan 478, Feb 438, Mar 677, Apr 454, May 411, Jun 325, Jul 533, Aug 501, Sep 683, Oct 860, Nov 515, Dec 569): Buds from Feb to Apr; Flowering from Mar to Sep; Peak Flowering not significant peaking in May; Over from Aug to Sep; Fruit from Sep to Mar; Nothing from Nov to Feb. Peak levels at 84% in May. Historically recorded as flowering from Feb to Nov, westerly races peaking in autumn and winter, and easterly races in spring and summer. <do rginal>



**Growth** (6362 records with: Jan 469, Feb 438, Mar 676, Apr 442, May 394, Jun 320, Jul 510, Aug 497, Sep 672, Oct 859, Nov 517, Dec 568): Much from Aug to May; Rare from Jan to Jun; None from Jan to Sep. Peak levels at 95% in Nov.



**Seedlings** (2840 records): Absent in 88%; fewer seedlings than prefire adults in 83 cases, and more in 81 cases. Seedlings found in Jan (7), Feb (6), Mar (8), Apr (10), May (13), Jun (19), Jul (20), Aug (11), Sep (26), Oct (9), Nov (7), Dec (28).

**Fire Survival** (384 records): 73% survived by seedlings only, 13% eliminated from the area by fires, 12% escaped fires in fire-safe areas, 2% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 5 years, and 100% recorded at about 15 years.



**Height** (6496 records): 2% 0-0.2 m tall, 28% 0.2-1 m tall, 60% 1-2 m tall, 10% 2-5 m tall.

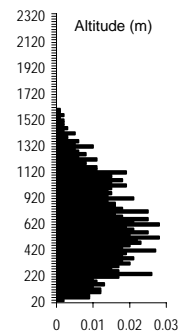
**Pollinators** (225 records): 75% birds, 15% beetles, 5% bees or wasps, 2% flies, 2% mites, 0.9% none observed, 0.4% mammals.

**Detailed Pollinators** (164 records): Cape Sugarbird (106), Orange-breasted Sunbird (37), Protea Rove Beetle (4), Great Protea Beetle (4), Honey Bee (3), Greater Double-collared Sunbird (3), Scarab Beetle (2), Monkey Beetle (2), Southern Double-collared Sunbird, Protea Itch Mite, Malachite Sunbird.

**Habitat:**

**Distance to Ocean** (6251 records): 94% inland - further than 2 km from coast.

**Altitude** (6251 records): 20 - 2360 m; 380 *lq* - 600 *med* - 840 *uq*m.



**Landform** (6217 records): 72% deep soil, 23% shallow soil, 4% rocky outcrops.

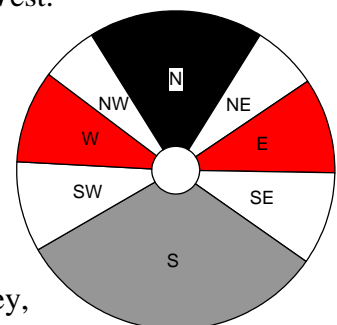
**Slope** (6230 records): 43% steep incline, 43% gentle incline, 7% hill top, 5% platform, 1% valley bottom, 1% cliff.

**Aspect** (5577 records): 42% South, 24% North, 17% East, 17% West.

**Soil Type** (6120 records):

43% loamy, 38% sandy, 8% gravelly, 5% rocky, 4% clayey, 2% peaty.

**Soil Colour** (6107 records): 44% grey,



41% brown, 8% black, 3% orange,  
2% yellow, 1% white, 1% red.

**Geology** (6100 records): 84% sandstone,  
9% shale, 3% granite, 2% silcrete or  
ferricrete, 1% conglomerate.

**Vegetation** (6221 records): 96% shrubland,  
2% plantations.

### Conservation Status and Threat:

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 29 047 km<sup>2</sup> with 27%  
conserved and 17% lost; Occupancy:  
4 859 km<sup>2</sup> with 38% conserved and 13%  
lost. Fragmentation index: 8%.

**Nature Reserves** (6251 records): 47% in nature  
reserves.

**Habitat destruction** (6081 records):  
89% extensive natural habitat, 6% islands,  
2% road verges, 2% naturally linear habitats.

**Alien Invasive Species** (6000 records):

41% none, 28% *Pinus*, 15% *Hakea*,  
14% Fabaceae (chiefly alien *Acacia*),  
1% Myrtaceae.

**Alien Density** (5989 records): 41% alien-free,  
46% sparse, 9% abundant, 3% dense.

### Cultivation & Utilization:

**Picking** (4499 records): 98% no sign of  
picking, 1% lightly picked, 0.8% severely  
picked.

**Cultivation Status:** Plantings - 156 records  
(2%), Augmentations - 2 records (0.03%),  
Escapes - 38 records (0.6%).

**Witch's Broom Infestation:** 95 records (1%).

### Atlassers Notes:

#### Size

These plants were exceptionally tall sturdy and  
healthy - the flowers were the largest we  
have seen (OUT94050704); Also found 1  
plant at least 5m tall - no evidence of past or  
present flowering- No buds no old cones  
very upright stems and very long internodes  
(OUTY1022405); Very tall amongst *P.*  
*mundii* up to 5m (WAM92122901);

#### Colour Variation

50:50 pink/white (HCE96062903); White and  
red flowering forms (SHR93052102); White  
form frequent (SJJ93042301); Pink and  
white form (SJJ93042302); Green petal  
bracts and black and appears to have a white  
flower (VJK93031402); Too beautiful for  
words pinks & white (VJK93032802); Pink  
(VJK93040801); All different in small ways  
- pinks cream dark red dark stripes and light  
stripes and their massed styles and black  
beards (VJK93050901); Flowers green  
something to do with soil ph will check  
(VJK93060701); Ye aint seen nothing till  
you have seen these colours (VJK93081901);  
Green flowerheads black beards there is the  
odd red one (VJK97080101); All green  
flowerheads (VJK97080808); Variation in  
colour of bracts tips from black to brown  
(WEL94070602);

#### Variation

Has leaf stalk and lower bracts suggest  
lepidocarpedendron but flowerheads normal!  
(APE93011604);

With some *laurifolia* features like leaf stalk  
(AGRY3022601); Intermediate population  
with *laurifolia* (ALA97103009); Leaves

rather elliptical with hint of stalk suggesting  
affinity to *laurifolia* - Peter Wedepohl raised  
this point and supplied specimens  
(TLE98061305); Very lush began to think  
they are *laurifolia* some with grey-blue  
leaves and big inflorescences but leaves too  
narrow but long (VJK95040201); I used to  
enjoy encountering *nerifolia* but now I  
always suspect *laurifolia* especially when I  
see blue-grey shrubs multi stemmed and  
elliptic leaves with red margin with short  
petiole (VJK95050702); Intermediate forms  
with *laurifolia* present (WIJ95072901);

#### Visitors

Orange Breasted Sunbird collected fine nesting  
material from old seedhead (AGR92042501);

Ants working in plants (GNIY1032921);

Ants present in some blooms  
(MCG96032401+2); Ants in flowerheads  
(SHS93032301); Ants found in flowers &  
variety of beetles (SHS93042101);

Smallish brown beetles on flowers - flowers  
fairly old but not dead yet (GNIY0120407);

Numerous 5mm shiny metallic blue beetles  
crawling over the flowerhead  
(WEL94030602); Long Black And White  
Beetle (WIJ94041702);

A Fulgorid eating the dry flowerhead - it was  
black in colour so I poked it to see if was  
alive & you should have seen the wicked  
looks it gave us Thank heavens it is not able  
to talk because we would have got a  
mouthful snakes (VJK93093006);

#### Damage

Quite severely eaten by buck (WMPY1032107);  
Selective chopping out 90% of plants killed -  
No obvious reason but with both buzz saw  
and axe (AGRY3103022);

#### Baboon damage

Baboon damage (AGR92080404,  
AGR93051501, APE92080212); Lots of  
baboon tearing off head [nectar?]  
(APE92080202); Lots of baboon damage -  
broken off inflorescences (APE92080217);  
"Picking" by baboons (GNIY0120504,  
OUT95082601+4); Baboon damage to  
flowerheads (LYM99060305); Some flowers  
also eaten by baboons (SMR99061606); One  
plant has been slightly damaged by baboons  
(according to the warden) (WAN97061001);

#### Postfire flowering

First flowers after burnt 1992 (DEL96032609-  
10);

#### Recruitment

Skeletons seen but no seedlings - second season  
after fire (AGRY0062601-3); Skeletons only  
(AGRY1032108);

1/10 previous population (AGRY1070701);  
1/100 prefire population (AGRY1070702);  
1/1000 young to skeletons (AGRY1070802);  
Skeletons but no seedlings or young plants  
(GNIY1032901); Virtually no reseedling on  
hilltop farm from what was once an  
incredibly dense population  
(MHGY0070802); Very poor recovery after  
fire - no seedlings spotted until after March  
2000 (MHGY0071001); Very poor  
regeneration despite there being many old  
skeletons - very few seedlings found  
(NGFY0030505); Regeneration was very  
poor despite there being many old skeletons  
(NGFY0030506); Extremely poor

recruitment evident at lower altitudes on this plot whereas at the high end recruitment was stunningly successful (NGFY2050209); Many dead adults but poor recruitment (SGAY1010601); Large area of 2.5m height plants burnt no sign of seedlings in burnt area (SMLY0121103); All dead no recruitment despite search (SMRY2050206); Flowered once before fire - No obvious recruitment after fire in 2-3 year old veld (PMRY0070202); Have same populations post and pre fire on this steep wet slope (AGRY1070804); Regeneration after feb 1988 fire exceptionally good (parent / Seedling) 1:9 (TMA92090901); Parent / seedling ratio up to 1: 31 (TMA92090902); Only 2 burnt plants observed in the plot but one of them had a plume of seedlings growing downwind from the parent (SMRY2050207);

#### **Senescence**

Stands of old plants - needs lightning! (AWA95101005); Very old (AWA97100702); Signs of senescence and starting to die (HRK93081803); Very, very old - bushes breaking apart (HRK96073002);

#### **Mortality**

Skeletons only (AGRY1010512, AGRY3100112); Dead only seen (AGRY1010601); Lots are dying ( Why? Old age or drought?) (GEKY0101201); Lots of die-back (OUT98040409); Dieback (OUT99090904); Killed by fire - no live plants seen (LYM98032103); Plants dead (OUT98013102); Some dying - apparently drought-related (WIJY0122310); Several dead plants - ?Drought-related (WIJY0122312);

#### **Stress**

In bad condition (AMMY0121512); Many young plants on rocky areas look stressed - further down very healthy (AWA99021802); Most proteas very stressed + looked like they were dying however many did have lots of new growth on the tips and some had flowers or buds - farmer reported very heavy rains in summer 1998? causing some disease and this winter has been the driest on record (WMPY0110401); Driest winter in recorded history - also heavy summer rains in Dec 1998? - Proteas very stressed and dying (WMPY0110402);

#### **Witches Broom**

Witches Hazel (DOA96100601); Abundant growth (GEKY0101406); Much - some football size (SMR99080703); Many (HRK96021601); Quite frequent up to football size (SMR99061606); Frequent (TLEY0100103); On some plants (CJL98062505, DJL96111308); Occasional (SMR99080702, SMRY0060208); Seen on 7 plants all within 10m (SMR96111308); One (SMR96111307); On young (OUT93080802);

#### **Confusing Species:** Mainly confused with *P.*

*laurifolia* (which has a leaf stalk and grey leaves) and *P. lepidocarpodendron* (which has two-tone bracts). Less frequently misidentified as *P. burchellii* (which has hairless involucre bracts and recessed flowers in the flowerheads) and *P. longifolia* (which does not have a beard and has longer thinner leaves), and very infrequently with: *P. obtusifolia* (no beard and harder, more oval leaves), *P. nitida* (oblong, grey leaves) and *P. lorifolia* (broad, strap-shaped leaves). The intermediate populations around Villiersdorp, posed a problem, but generally *P. laurifolia* was more commonly mistaken for *P. neriifolia* than the other way around, presumably because the latter seldom forms a neat single-stemmed tree (remaining a large shrub), and because it very seldom has glaucous leaves.

Records of identification queries = 154.

Records of corrected identification queries = 81.

**Variation and Taxonomy:** Involucre bract colour varies tremendously from creamy-green, to dusty pink to deep carmine, often with either cream or pink predominating. Beards vary from white to the usual purple-black, across the entire spectrum. A few forms, typically in the west, have blue-grey leaves, rather than the typical bright green leaves.

**Distribution:** Add.

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*Protea speciosa* L. 1771  
**Brown-beard Sugarbush**  
*Bruinbaardsuikerbos*

**Other Common Names:** Duke Sugarbush, Showy Erodendrum, *Baardsuikerbos*, *Kreupelboom*, *Suikerbos*.

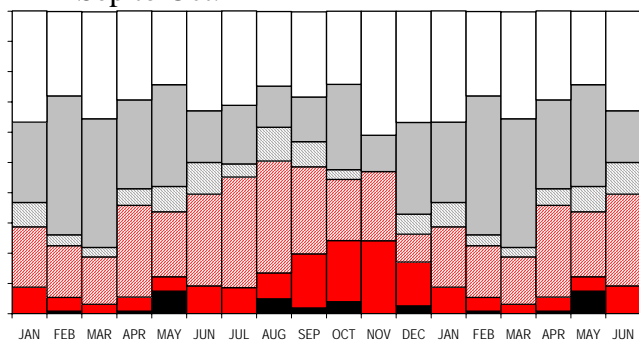
**Other Scientific Names:** *barbata* Lam 1791, *patersonii* L.Bolus 1929.

**1307 Records**

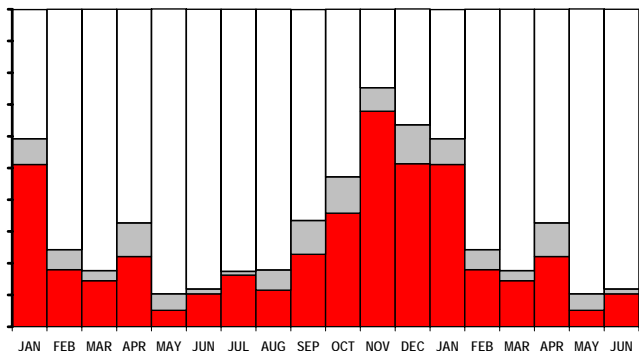
**Population** (1291 records): 2% Common, 31% Frequent, 67% Rare.

**Dispersion** (854 records): 61% variable, 33% clumped, 4% widespread, 2% evenly distributed.

**Flowering** (1279 records with: Jan 136, Feb 111, Mar 127, Apr 109, May 107, Jun 76, Jul 93, Aug 81, Sep 156, Oct 124, Nov 83, Dec 76): Buds from Jan and Apr to Nov; Flowering from Oct to Nov; Peak Flowering and Over not significant; Fruit from Dec to May and Oct; Nothing from all year round. Peak levels at 62% in Aug. Historically recorded as flowering from Jun to Jan, peak in Sep to Oct.



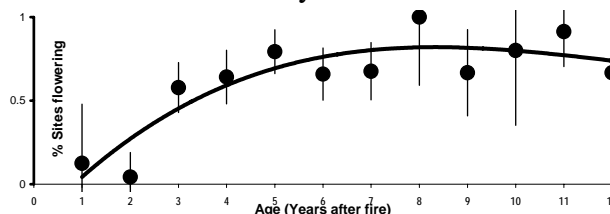
**Growth** (1235 records with: Jan 135, Feb 111, Mar 124, Apr 104, May 97, Jun 67, Jul 92, Aug 78, Sep 149, Oct 123, Nov 81, Dec 74): Much from Apr and Sep to Jan; Rare not significant; None from all year round. Peak levels at 75% in Nov.



**Seedlings** (476 records): Absent in 97%: fewer seedlings than prefire adults in 7 cases, and more in 1 case. Seedlings found in Mar (2), Apr (2), Jun, Jul and Sep (2).

**Fire Survival** (193 records): 95% resprouted from underground boles, 3% escaped fires in fire-safe areas, 1% survived by seedlings only, 1% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% recorded at 8 years.



**Height** (1287 records): 4% 0-0.2 m tall, 92% 0.2-1 m tall, 3% 1-2 m tall.

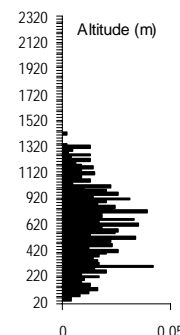
**Pollinators** (4 records): 50% beetles, 25% birds, 25% none observed.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (1268 records): 78% inland - further than 2 km from coast.

**Altitude** (1268 records): 20 - 1360 m; 360 *lq* - 600 *med* - 800 *uq*m.



**Landform** (1255 records): 74% deep soil, 19% shallow soil, 7% rocky outcrops, 0.3% swamp, 0.1% riverine.

**Slope** (1259 records): 47% steep incline, 39% gentle incline, 8% hill top, 3% platform, 2% cliff.

**Aspect** (1126 records): 54% South, 21% East, 15% West, 10% North.

**Soil Type** (1254 records):

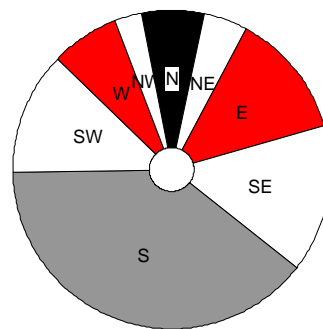
70% sandy, 13% loamy, 12% peaty, 2% rocky, 2% gravelly.

**Soil Colour** (1249 records):

65% grey, 20% black, 10% brown, 6% white.

**Geology** (1259 records): 99% sandstone.

**Vegetation** (1259 records): 99% shrubland, 1% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 8 574 km<sup>2</sup> with 26% conserved and 28% lost; **Occupancy:** 957 km<sup>2</sup> with 53% conserved and 9% lost. **Fragmentation index:** 5%.

**Nature Reserves** (1268 records): 68% in nature reserves - well conserved.

**Habitat destruction** (1234 records): 98% extensive natural habitat, 1% naturally linear habitats.

**Alien Invasive Species** (1221 records):  
58% none, 33% *Pinus*, 7% Fabaceae (chiefly alien *Acacia*), 1% *Hakea*.  
**Alien Density** (1220 records): 58% alien-free, 39% sparse, 2% abundant.

**Cultivation & Utilization:**

**Picking** (746 records): 99% no sign of picking, 0.8% lightly picked, 0.1% severely picked.

**Cultivation Status:** Plantings - 4 records (0.3%).

**Witch's Broom Infestation:** 2 records (0.2%).

**Atlassers Notes:**

**Height**

Shoulder high to compete with conebushes (AKS93072205);

**Flowering and seeds**

Vigorous flowering! (PVR91111701); 65% have old cones (CNR95051702); Two infructescence only (MAJ92011501);

Some plants with hard dead buds (JAT97062601); Aborted bud (MURY2022305);

**Colour forms**

Bud creamy white tip with brown hairs (OUT96050404); One plant had bud (8cm long) with bracts shiny light green each tipped with white hairy fringe (SMR97021902); Flower bud white with brown beard, pink with brown beards here last year (VJK93022105); Pink cream flowers brown beards too beautiful for words (VJK93052301); Deep rose pink brown beard very beautiful (VJK94080706+10); Pale Pink (WMP93110701); Beautiful salmon pink colour (one specimen) (WMP93110702);

**Predation and parasitism**

Picking by baboons (GNIY0120503); Stems gnawed through; (TLEY0050603); Many have large galls (TLE94082109); Gall on many stem up to 7cm in diam (WIJ94070203); Thickened galls with holes on stem (WIJ99041703);

**Mortality**

1 dead plant dropping seeds seen (AGRY0050703); Dead 1 plant (AGRY0100810, AGRY1021802); About 50m apart, both look near death! (CNR95042601); Plants quite healthy - 1 dead (CNR95051702); All looking old and tattered (AWA95031604);

0% recruitment in all atlased pops (CNR95041302);

**Population distribution**

Only a few more than 10 (JAT95051101); Only One in area (PAP94081701);

Clump of 4 bushes on rocky outcrop (AKS92040206); One plant seen just below summit (SHR93062601);

Only seen in firebelt (AGR91092205); On or near rocky outcrops (CJL98062202); Growing on ledges and between rocks (JID94103101);

**Pollination**

Mice Tracks (FBH95061403);

**Confusing Species:** The larger leaf form is readily confused with *P. grandiceps*, which does not resprout. The lack of flowerheads often proved a barrier to easy identification among those not used to looking for resprouting. Thus other bearded proteas (*P. coronata*, *stokoei*, *magnifica*) were occasionally given. Those without seedheads as well were occ. identified as *P. nitida* (dwarf form), and even once with *L. spissifolium*.

The galls recorded on the plant are quite ubiquitous and may well be a useful diagnostic feature!

Records of identification queries = 24.

Records of corrected identification queries = 9.

**Variation and Taxonomy:** Leaf variation varies considerably: the majority of populations have leaves broadly ovate to oblanceolate and 40-60mm wide.

- Onrust and Kleinrivier populations have narrowly oblanceolate leaves about 10 mm wide. These tend to have pale-yellow bracts. These were previously regarded as a separate species: *P. patersonii*.
- The Grootkop forms have exceptionally broad oval leaves and are often mistaken for *P. grandiceps*.

Beard colour is usually chocolate brown or golden-tawny, but white beards predominate in the Hottentots-Holland Nuweberg area.

**Distribution:** Add.

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*Protea stokoei* Phill. 1923

**Pink Sugarbush**

*Blosendesuikerbos*

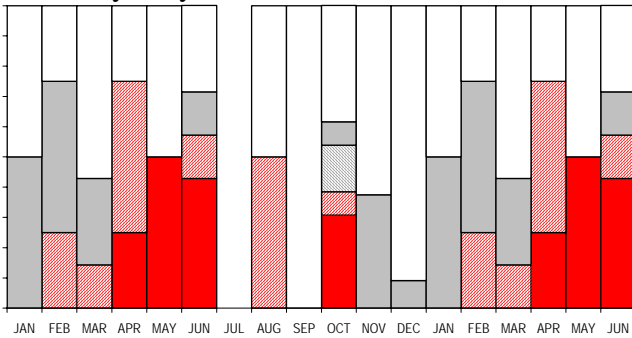
**Other Common Names:** Blushing Protea, Stokoe's Sugarbush.  
**Other Scientific Names:** *None*.

**75 Records**

**Population** (75 records): 12% Common, 52% Frequent, 36% Rare.

**Dispersion** (66 records): 48% clumped, 47% variable, 3% evenly distributed, 2% widespread.

**Flowering** (74 records with: Jan 8, Feb 8, Mar 7, Apr 4, May 2, Jun 7, Jul 0, Aug 2, Sep 4, Oct 13, Nov 8, Dec 11): Buds from Feb, Apr and Aug; Flowering from Apr to Jun and Oct; Peak Flowering not recorded; Over not significant; Fruit from Jan to Mar and Nov; Nothing from all year round. Peak levels unreliable at 75% in Apr. Historically recorded as flowering from May to Oct, mainly May to Jun.



**Height** (75 records): 16% 0-0.2 m tall, 47% 0.2-1 m tall, 36% 1-2 m tall, 1% 2-5 m tall.

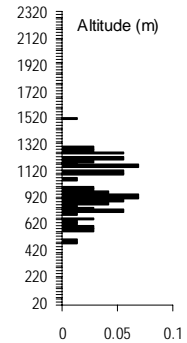
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (72 records): 97% inland - further than 2 km from coast.

**Altitude** (72 records): 460 - 1420 m; 760 *lq* - 840 *med* - 1000 *uq*m.

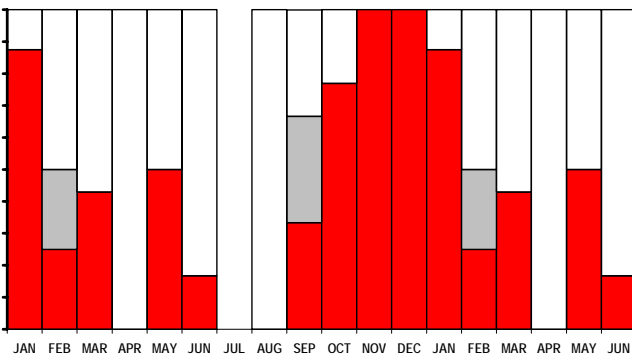


**Landform** (71 records): 69% deep soil, 27% shallow soil, 4% swamp.

**Slope** (71 records): 54% steep incline, 21% gentle incline, 13% hill top, 11% cliff, 1% valley bottom.

**Aspect** (64 records): 60% South, 21% East, 10% North, 9% West.

**Growth** (72 records with: Jan 8, Feb 8, Mar 7, Apr 4, May 2, Jun 6, Jul 0, Aug 2, Sep 3, Oct 13, Nov 8, Dec 11): Much from Sep to Mar and May; Rare from Feb and Sep; None from Feb to Oct. Peak levels at 100 % in Nov to Dec.

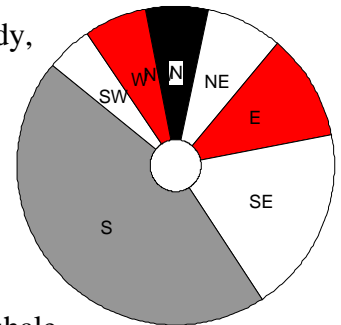


**Soil Type** (71 records): 44% peaty, 30% sandy, 18% loamy, 6% rocky, 3% gravelly.

**Soil Colour** (71 records): 42% black, 38% grey, 17% brown, 1% white, 1% red.

**Geology** (69 records): 96% sandstone, 4% shale.

**Vegetation** (71 records): 100% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Endangered

B1a(i,ii)b(i,ii,iii,iv,v)+B2a(i,ii)b(i,ii,iii,iv,v).

Occurrence (Fynbos): 524 km<sup>2</sup> with 46% conserved and 31% lost; Occupancy: 91 km<sup>2</sup> with 80% conserved and 0% lost. Fragmentation index: 17%.

**Nature Reserves** (72 records): 90% in nature reserves - well conserved.

**Habitat destruction** (70 records): 99% extensive natural habitat, 1% naturally linear habitats.

**Alien Invasive Species** (70 records): 70% none, 30% *Pinus*.

**Alien Density** (70 records): 70% alien-free, 29% sparse, 1% abundant.

**Seedlings** (46 records): Absent in 96%: more seedlings than prefire adults in 1 case. Seedlings found in Nov.

**Fire Survival** (7 records): 86% survived by seedlings only, 14% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 8 years, 50% estimated at 12 years, and 100% recorded at 15 years.

**Cultivation & Utilization:**

**Picking** (63 records): 98% no sign of picking, 2% severely picked.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 6 records (8%).

**Atlasers Notes:**

Not yet flowered (AGR91122608); Two infructescence only (MAJ92011501); Two plants flowering for first time (MAJ98060801);

This was a huge colony prior to the fire breaks destroying 2/3 of the population in 1985: good recovery of young plants out numbering the old plants outside the break (APE93011606); Plants on E side less than 1m in tall and on W side much older and larger than 1m tall with only few new terminal leaves and many old flower heads. Uneven previous burn? (MAJ92031501);

Large previous generation of about 1000 burnt standing adults with very many young plants (MAJ93031801); 16 plants (APE94031203); 11 plants (APE94031203); One plant growing right in amongst large rocks

(LYM98101901); Occurring only as single plants scattered over about 250m of ridge top (MAJ96030502); Plant on more easterly aspect of site where most moist (MAJY2013005);

Spectacular red Witches Broom up to football size, but typically half that (AGR96060305)

**Confusing Species:** Easily confused with *P. speciosa* if resprouting versus single-stemmed tree not noted. More often, because of the long period to flowering, flowerless plants are confused with *P. grandiceps*.

Records of identification queries = 2.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** None noted or recorded.

**Distribution:** Add.

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*Protea caespitosa* Andrews 1803 Hottentotsholland form  
**Hottentot Bishop Sugarbush**

**Other Common Names:** Dual-leafground  
 Protea, Turfy Erodendrum.

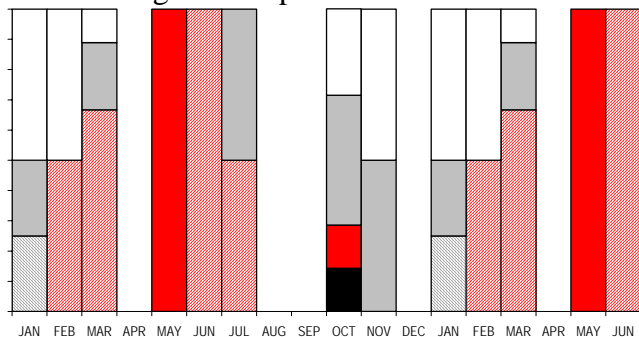
**Other Scientific Names:** *oleraceae* Guthrie  
 1925, *turbiniflora* (Salisb) RBr.

**29 Records**

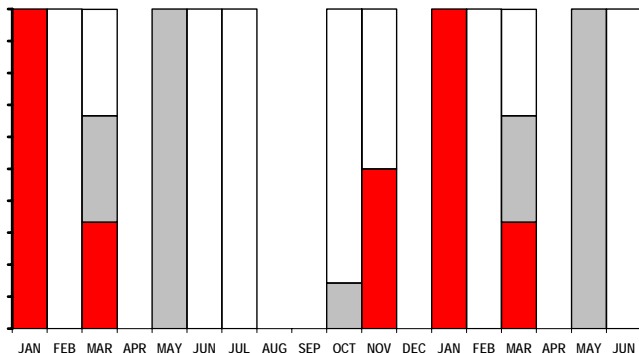
**Population** (29 records): 24% Common,  
 59% Frequent, 17% Rare.

**Dispersion** (27 records): 59% variable,  
 37% clumped, 4% widespread.

**Flowering** (29 records with: Jan 4, Feb 2, Mar 9, Apr 0, May 1, Jun 2, Jul 2, Aug 0, Sep 0, Oct 7, Nov 2, Dec 0): Buds from Feb, Mar, Jun and Jul; Flowering from May; Peak Flowering not significant; Over from Jan; Fruit from Jan, Mar and Jul to Nov; Nothing from Oct to Feb. Peak levels unreliable at 29% in Oct. Historically recorded as flowering from Sep to Nov.



**Growth** (28 records with: Jan 4, Feb 2, Mar 9, Apr 0, May 1, Jun 1, Jul 2, Aug 0, Sep 0, Oct 7, Nov 2, Dec 0): Much from Nov to Mar; Rare from Mar to May; None from Feb to Mar and Jun to Nov. Peak levels unreliable at 100% in Jan.



**Seedlings** (11 records): Absent in 82%: fewer seedlings than prefire adults in 1 case. Seedlings found in Mar.

**Fire Survival** (3 records): 67% eliminated from the area by fires, 33% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 2 years, and 100% recorded at 4 years.



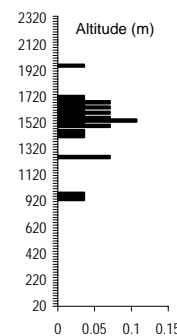
**Height** (28 records): 64% 0-0.2 m tall,  
 36% 0.2-1 m tall.

**Pollinators** (1 record): 100% mammals.  
**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (28 records):  
 100% inland - further than 2 km from coast.

**Altitude** (28 records): 820 - 1860 m; 1340 *lq* - 1440 *med* - 1500 *uq*m.



**Landform** (28 records):  
 64% deep soil, 29% shallow soil, 7% rocky outcrops.

**Slope** (28 records): 43% gentle incline, 32% steep incline, 14% hill top, 7% platform, 4% cliff.

**Aspect** (26 records): 35% South, 27% East, 19% North, 19% West.

**Soil Type** (28 records):

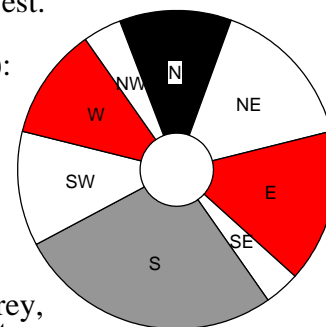
39% loamy,  
 29% gravelly,  
 11% sandy,  
 11% peaty,  
 7% rocky,  
 4% clayey.

**Soil Colour** (28 records):

50% brown, 32% grey,  
 14% black, 4% white.

**Geology** (27 records): 52% sandstone,  
 48% shale.

**Vegetation** (28 records): 96% shrubland,  
 4% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened  
 B1a(i)c(iv), D2(i).

Occurrence (Fynbos): 696 km<sup>2</sup> with 76% conserved and 12% lost; Occupancy: 37 km<sup>2</sup> with 98% conserved and 0% lost. Fragmentation index: 5%.

**Nature Reserves** (28 records): 96% in nature reserves - well conserved.

**Habitat destruction** (28 records):  
 89% extensive natural habitat, 7% naturally linear habitats, 4% islands.

**Alien Invasive Species** (27 records): 56% none,  
 44% *Pinus*.

**Alien Density** (27 records): 56% alien-free,  
 37% sparse, 7% abundant.

**Cultivation & Utilization:**

**Picking** (22 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

Some plants up to 2m diam and much bigger than those on Victoria Peak (? Less Fires?) (WIJ93032103);

60 % in bud 40% without any bud or cone (NAH94031901); Very few young plants in burnt area but numerous burned ones (WIJ93032103); Code killed - many! - others escaped with only the outer leaves burnt & dead (WIJ99062604);

On patch of shale (TLE95021804);  
Small stand of plants at summit (TLE97102609);

**Confusing Species:** Quite distinctive, although seedlings have been confused with *P.*

*acaulos*. In flower or seed, the brown leaves around the base of the flowerhead are unique.

Records of identification queries = 2.

**Variation and Taxonomy:** This is the most widespread variant. Two others are treated separately as they are so distinct. These should have the status of subspecies. The Hottentots-Holland subspecies has broadly oblanceolate leaves 40-70mm wide.

**Distribution:** Add.

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*Protea caespitosa* Andrews 1803 Kogelberg form  
**Kogelberg Bishop Sugarbush**

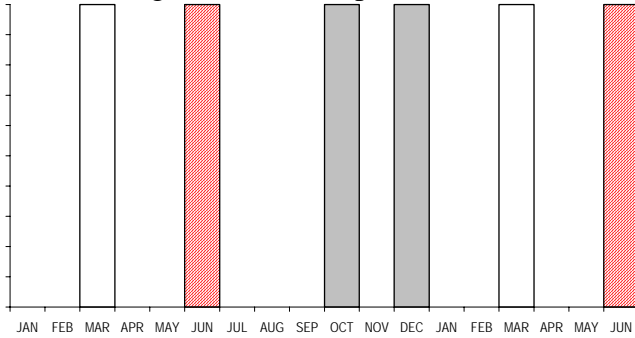
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**4 Records**

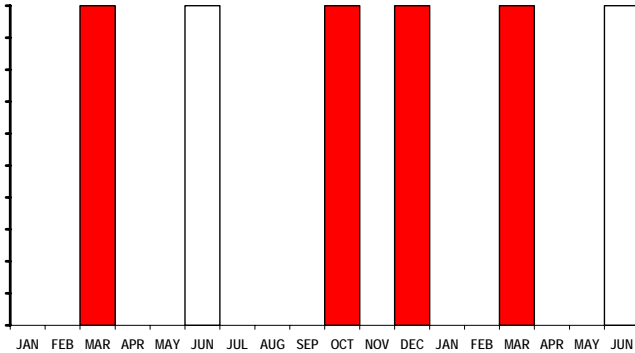
**Population** (4 records): 50% Common, 50% Frequent.

**Dispersion** (4 records): 75% clumped, 25% variable.

**Flowering** (4 records with: Jan 0, Feb 0, Mar 1, Apr 0, May 0, Jun 1, Jul 0, Aug 0, Sep 0, Oct 1, Nov 0, Dec 1): Buds from Jun; Flowering, Peak Flowering and Over not recorded; Fruit from Oct to Dec; Nothing from Mar. Peak levels unreliable. Historically recorded as flowering from Jul to Sep.



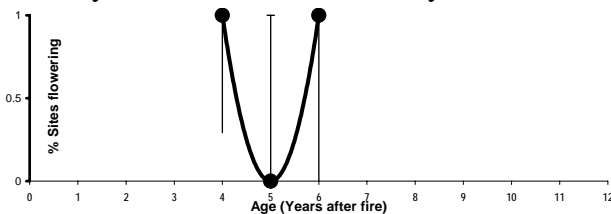
**Growth** (4 records with: Jan 0, Feb 0, Mar 1, Apr 0, May 0, Jun 1, Jul 0, Aug 0, Sep 0, Oct 1, Nov 0, Dec 1): Much from Oct to Mar; Rare not recorded; None from Jun. Peak levels unreliable.



**Seedlings** (3 records): All without any seedlings present.

**Fire Survival** : No data.

**Age to first flowering:** First flowers recorded at 4 years, 50% estimated at 6 years,.



**Height** (4 records): 50% 0-0.2 m tall, 50% 0.2-1 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (4 records): 100% inland - further than 2 km from coast.

**Altitude** (4 records): 960 - 1080 m; 980<sub>lq</sub> - 1000<sub>med</sub> - 1000<sub>uq</sub>m.

**Landform** (4 records): 50% deep soil, 50% shallow soil.

**Slope** (4 records): 100% steep incline.

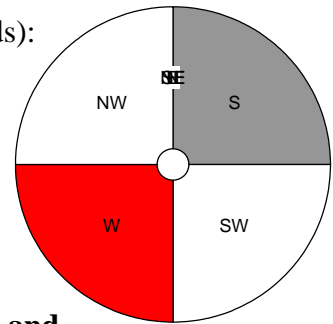
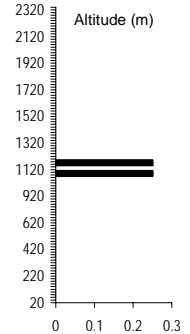
**Aspect** (4 records): 50% West, 38% South, 13% North.

**Soil Type** (4 records): 50% clayey,

50% peaty.  
**Soil Colour** (4 records): 75% brown, 25% black.

**Geology** (4 records): 75% shale, 25% sandstone.

**Vegetation** (4 records): 100% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Critically Endangered B1a(ii)c(iv)+2a(ii)c(iv).

**Occurrence (Fynbos):** 2 km<sup>2</sup> with 34% conserved and 0% lost; Occupancy: 6 km<sup>2</sup> with 5% conserved and 0% lost. Fragmentation index meaningless.

**Nature Reserves** (4 records): 100% in nature reserves - well conserved.

**Habitat destruction** (4 records): 100% extensive natural habitat.

**Alien Invasive Species** (3 records): 100% none.

**Alien Density** (3 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (3 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

Leaves broad and cabbage-like - 70mm (although not as broad as those in the neck below the 5th Beacon: 80mm and more oval in shape) (MAJ93062201);

**Confusing Species:** None known.. Records of identification queries = 1.

**Variation and Taxonomy:** This differs from the other two subspecies in having broadly obovate leaves 70-90mm wide. Historically it was considered a separate species *P. oleracea*. This grows the tallest of the three subspecies, reaching 0.7m tall.

**Distribution:** Add.

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*Protea caespitosa* Andrews 1803 Riviersonderend form

**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**4 Records**

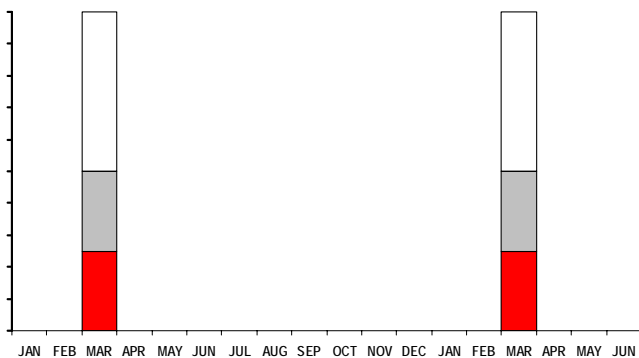
**Population** (4 records): 0% Common, 100% Frequent.

**Dispersion** (4 records): 75% clumped, 25% variable.

**Flowering** (4 records with: Jan 0, Feb 0, Mar 4, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 0, Dec 0): Buds from Mar; Flowering, Peak Flowering, Over and Fruit not recorded; Nothing from Mar. Peak levels unreliable. Historically recorded as flowering from Sep to Nov.



**Growth** (4 records with: Jan 0, Feb 0, Mar 4, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 0, Dec 0): Much from Mar; Rare from Mar; None from Mar. Peak levels unreliable.



**Seedlings** (3 records): All without any seedlings present.

**Fire Survival** (1 record): 100% survived by seedlings only.

**Age to first flowering:** No data.

**Height** (4 records): 75% 0-0.2 m tall, 25% 0.2-1 m tall.

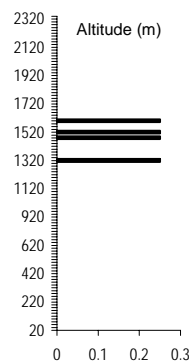
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (4 records): 100% inland - further than 2 km from coast.

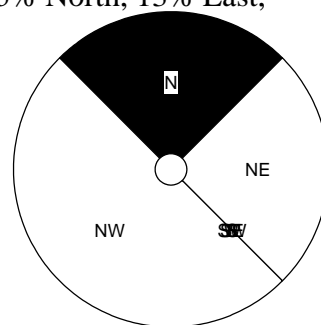
**Altitude** (4 records): 1200 - 1500 m; 1360 *lq* - 1380 *med* - 1380 *uq*m.



**Landform** (4 records): 75% deep soil, 25% shallow soil.

**Slope** (4 records): 50% steep incline, 50% gentle incline.

**Aspect** (4 records): 75% North, 13% East, 13% West.



**Soil Type** (4 records): 50% gravelly, 25% loamy, 25% rocky.

**Soil Colour** (4 records): 75% brown, 25% grey.

**Geology** (4 records): 75% sandstone, 25% shale.

**Vegetation** (4 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Endangered B1a(i,ii)c(iv)+2a(i,ii)c(iv), D.

**Occurrence (Fynbos):** 3 km<sup>2</sup> with 83% conserved and 0% lost; **Occupancy:** 9 km<sup>2</sup> with 79% conserved and 0% lost. Fragmentation index meaningless.

**Nature Reserves** (4 records): 75% in nature reserves - well conserved.

**Habitat destruction** (4 records): 100% extensive natural habitat.

**Alien Invasive Species** (4 records): 50% *Hakea*, 50% *Pinus*.

**Alien Density** (4 records): 100% sparse.

**Cultivation & Utilization:**

**Picking** (3 records): 100% no sign of picking.  
**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

None.

**Confusing Species:** None known.

**Variation and Taxonomy:** This subspecies has the thinnest leaves in the genus, being narrowly oblanceolate at 20-33mm wide.

**Distribution:** Add.

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*Protea amplexicaulis* (Salisb.) R.Br. 1805, 1810

**Clasping-leaf Sugarbush**

*Bloekomblaarsuikerbos*

**Other Common Names:** Amplexicaule Pleuranthe, Ivy-leaf Sugarbush, Shy Sugarbush, Stem-clasping Sugarbush, Tophats, *Aardroos*, *Joey*.

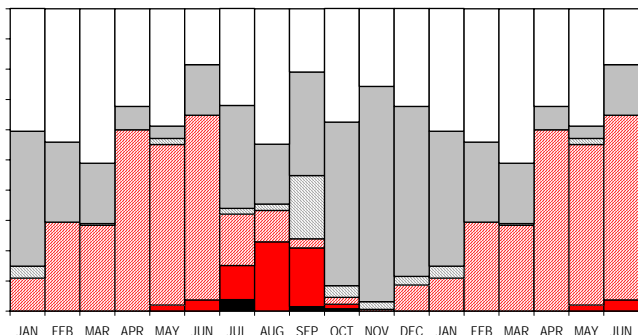
**Other Scientific Names:** *repens* Andr 1803.

**1244 Records**

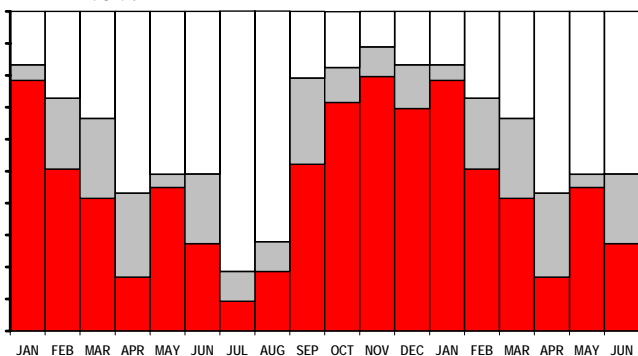
**Population** (1236 records): 19% Common, 45% Frequent, 35% Rare, 1% Extinct.

**Dispersion** (966 records): 74% variable, 23% clumped, 3% widespread, 0.4% evenly distributed.

**Flowering** (1198 records with: Jan 101, Feb 136, Mar 176, Apr 65, May 49, Jun 54, Jul 53, Aug 96, Sep 67, Oct 133, Nov 163, Dec 105): Buds from Feb to Jun; Flowering from Aug; Peak Flowering not significant; Over from Sep; Fruit from Jul to Mar 20; Nothing from Jul May. Peak levels at 65% in Jun. Historically recorded as flowering from Jun to Sep, with flush from Jul to Aug, with lowland populations earlier than higher altitude ones.



**Growth** (1202 records with: Jan 102, Feb 136, Mar 176, Apr 65, May 49, Jun 55, Jul 54, Aug 97, Sep 67, Oct 137, Nov 162, Dec 102): Much from Sep to Mar and May to Jun; Rare from Feb to Apr, Jun and Sep; None from Feb to Sep. Peak levels at 89% in Nov.

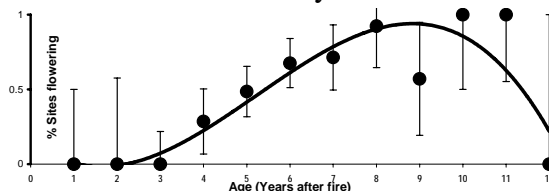


**Seedlings** (510 records): Absent in 94%; fewer seedlings than prefire adults in 11 cases, and more in 4 cases. Seedlings found in Jan (3), Jun, Sep (3), Oct (2), Nov (4) and Dec (2).

**Fire Survival** (63 records): 52% survived by seedlings only, 35% eliminated from the area

by fires, 6% escaped fires in fire-safe areas, 6% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 5 years, and 100% recorded at 10 years.



**Height** (1219 records): 35% 0-0.2 m tall, 65% 0.2-1 m tall, 0.1% 1-2 m tall.

**Pollinators** (11 records): 73% mammals, 18% birds, 9% flies.

**Detailed Pollinators** (3 records): Orange-breasted Sunbird (2), Vinegar Fly.

**Habitat:**

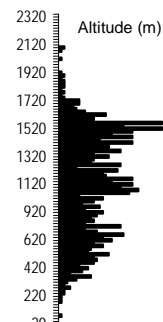
**Distance to Ocean** (1215 records): 100% inland - further than 2 km from coast.

**Altitude** (1215 records): 160 - 2000 m; 700 *lq* - 1020 *med* - 1300 *uq*m.

**Landform** (1211 records): 69% deep soil, 28% shallow soil, 3% rocky outcrops.

**Slope** (1209 records): 47% gentle incline, 42% steep incline, 7% hill top, 3% platform.

**Aspect** (1090 records): 31% North, 28% South, 23% East, 17% West.



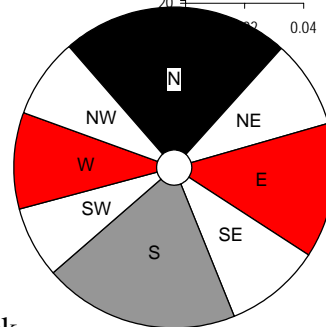
**Soil Type** (1204 records):

45% sandy, 26% loamy, 13% gravelly, 10% rocky, 3% clayey, 2% peaty.

**Soil Colour** (1201 records): 49% grey, 37% brown, 4% orange, 3% black, 3% white, 3% yellow.

**Geology** (1195 records): 80% sandstone, 17% shale, 2% granite.

**Vegetation** (1211 records): 99% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 6 584 km<sup>2</sup> with 22% conserved and 14% lost; **Occupancy:** 1 074 km<sup>2</sup> with 34% conserved and 7% lost. **Fragmentation index:** 10%.

**Nature Reserves** (1215 records): 39% in nature reserves.

**Habitat destruction** (1190 records): 96% extensive natural habitat, 2% naturally linear habitats, 2% islands.

**Alien Invasive Species** (1188 records):

41% *Pinus*, 38% none, 16% *Hakea*,  
4% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (1183 records): 38% alien-free,  
55% sparse, 5% abundant, 2% dense.

**Cultivation & Utilization:**

**Picking** (841 records): 100% no sign of  
picking, 0.4% lightly picked.

**Cultivation Status:** Plantings - 1 record  
(0.08%).

**Witch's Broom Infestation:** 19 records (2%).

**Atlassers Notes:**

Large and sprawling about 2m2  
(MAJ92020201);

Equals prefire densities (AGRY1032101);

Skeletons in last generation = common - not  
so many young (AGRY1032105); Currently  
Less than half the previous generation  
(AGRY0112323); All plants burnt dead no  
seedlings emerged only skeletons visible  
(JNIY0033002-3);

Dead (AGRY1032405); 1 skeleton seen  
(AGRY1072816); 1 dead plant  
(AGRY1103107); Half plants seen dead  
(AGRY1022119, AGRY6020805); Half of  
plants dead! summer drought - this species  
(alone in this plot but north of here also *L.*  
*rubrum* and *P. repens*) taking strain - still  
lots of survivors though! (AGRY6022205);

Many dead plants (AWA96101403  
VCH99012706); Also some dead  
(VCH99060503); Not sure of fate - had a lot  
of dead branches (AWA96101402);  
Very stressed and looked like they were dying  
however many did have lots of new growth  
on the tips and some had flowers or buds.  
Farmer reported very heavy rains in summer  
1998? causing some disease and this winter  
has been the driest on record  
(WMPY0110401);  
Full of Witch - many plants dead  
(AWA96101505); Much Witches Broom  
(SMRY0072103);

**Confusing Species:** None recorded.  
Records of identification queries = 2.

**Variation and Taxonomy:** No notable  
geographical ariation noted. At higher  
elevations the leaves have a blue-grey  
glaucescence, with new growth blushed pink  
to pale-purple.

**Distribution:** Add.

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*Protea cordata* Thunb. 1781

**Heart-leaf Sugarbush**

*Hartblaarsuikerbos*

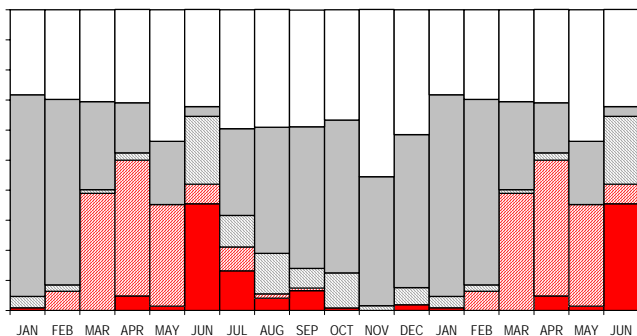
**Other Common Names:** Heart-leaf Pleuranthe, *Hartblaargrondprotea*.  
**Other Scientific Names:** *cordifolia* (Salisb. ex Knight) Sims 1809.

**888 Records**

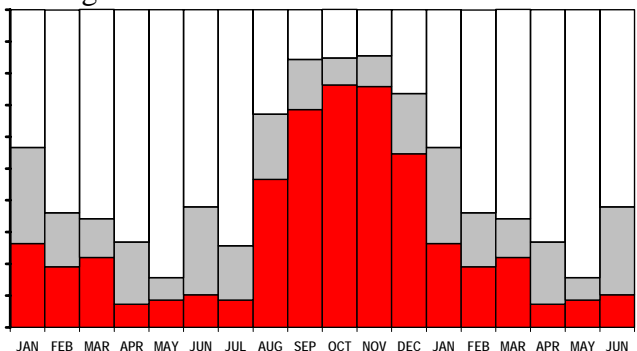
**Population** (868 records): 1% Abundant, 26% Common, 56% Frequent, 17% Rare.

**Dispersion** (765 records): 70% variable, 22% clumped, 7% widespread, 1% evenly distributed.

**Flowering** (848 records with: Jan 106, Feb 47, Mar 82, Apr 42, May 71, Jun 31, Jul 38, Aug 74, Sep 121, Oct 120, Nov 63, Dec 53): Buds from Mar to May; Flowering from Jun; Peak Flowering not recorded; Over from Jun; Fruit from Jul to Mar and May; Nothing from all year round. Peak levels at 65% in Jun. Historically recorded as flowering from Jun to Jul.



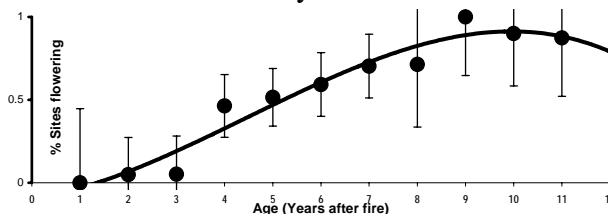
**Growth** (837 records with: Jan 106, Feb 47, Mar 82, Apr 41, May 70, Jun 29, Jul 35, Aug 73, Sep 121, Oct 118, Nov 62, Dec 53): Much from Aug to Jan and Mar; Rare from Jan, Apr, Jun and Aug; None from Dec to Aug. Peak levels at 86% in Nov.



**Seedlings** (373 records): Absent in 86%; fewer seedlings than prefire adults in 12 cases, and more in 15 cases. Seedlings found in Jan (7), Mar, May (2), Jul, Aug (2), Sep (6), Oct (3), Nov and Dec (4).

**Fire Survival** (54 records): 76% survived by seedlings only, 17% eliminated from the area by fires, 6% resprouted from underground boles, 2% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 5 years, and 100% recorded at 9 years.



**Height** (853 records): 43% 0-0.2 m tall, 56% 0.2-1 m tall, 0.6% 1-2 m tall.

**Pollinators** (3 records): 67% mammals, 33% birds.

**Detailed Pollinators** (1 record): Cape Sugarbird.

**Habitat:**

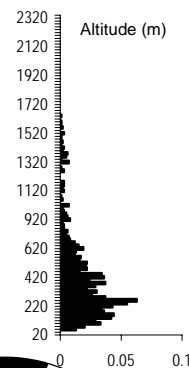
**Distance to Ocean** (853 records): 76% inland - further than 2 km from coast.

**Altitude** (853 records): 40 - 1540 m; 180<sub>iq</sub> - 300<sub>med</sub> - 460<sub>uq</sub>m.

**Landform** (836 records): 79% deep soil, 14% shallow soil, 6% rocky outcrops.

**Slope** (834 records): 53% gentle incline, 36% steep incline, 7% hill top, 4% platform, 1.0% valley bottom.

**Aspect** (760 records): 44% South, 21% West, 18% East, 17% North.



**Soil Type** (834 records):

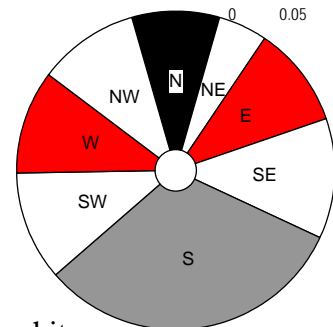
59% sandy, 22% loamy, 9% gravelly, 6% clayey, 2% rocky, 2% peaty.

**Soil Colour** (833 records):

59% grey, 26% brown, 5% white, 5% black, 3% orange, 2% yellow.

**Geology** (838 records): 77% sandstone, 18% shale, 2% silcrete or ferricrete, 1% granite, 1.0% conglomerate.

**Vegetation** (845 records): 99% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 6 879 km<sup>2</sup> with 26% conserved and 24% lost; Occupancy: 607 km<sup>2</sup> with 37% conserved and 14% lost. Fragmentation index: 4%.

**Nature Reserves** (853 records): 60% in nature reserves - well conserved.

**Habitat destruction** (813 records):  
97% extensive natural habitat, 2% naturally linear habitats, 1% islands.

**Alien Invasive Species** (811 records):  
45% none, 32% *Pinus*, 13% *Hakea*,  
8% Fabaceae (chiefly alien *Acacia*),  
2% Myrtaceae.

**Alien Density** (810 records): 45% alien-free,  
48% sparse, 7% abundant.

**Cultivation & Utilization:**

**Picking** (551 records): 100% no sign of  
picking, 0.4% lightly picked.

**Cultivation Status:** Plantings - 5 records  
(0.6%).

**Atlassers Notes:**

Only 4 plants in younger veld while many in  
older veld (KWD92100404);  
Largest leaves I have ever seen (120mm wide x  
180mm long) - longer than dimensions in  
Sasol guidebook (WEL96031706);  
Something seems to be grazing on leaves of  
young plants - likely to be a caterpillar but  
was unable to find the culprit  
(TSA93022501);

Half of plants seen dead (AGRY0011406)!;  
50% dead (AGRY0011410); Lots dead  
(AGRY3111213); Lots dead: 2 to each live  
(AGRY0011402); Only dead seen  
(AGRY0010809);

Nearly dead (LYM99041303);

**Confusing Species:** Very distinctive with its  
large, heart-shaped leaves. Apart from a  
single confusion with *P. amplexicaulis*, all  
errors were transcription errors with *P.*  
*coronata*.

Records of identification queries = 10.

Records of corrected identification queries = 6.

**Variation and Taxonomy:** No variation noted.  
The only *Protea* that produces branches that do  
not continue growing. All branches are  
produced from the rootstock and expanded  
over a few weeks to full size. Surprisingly  
the rootstocks are invariably killed by fire.

**Distribution:** Add.

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*Protea decurrens* Phill. 1910  
**Linear-leaf Sugarbush**  
*Overbergesuikerbos*

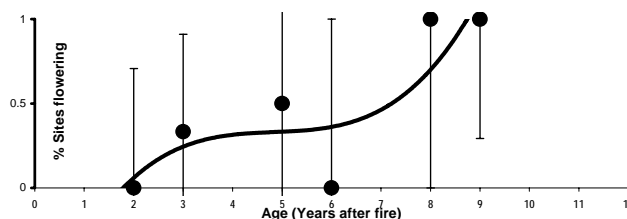
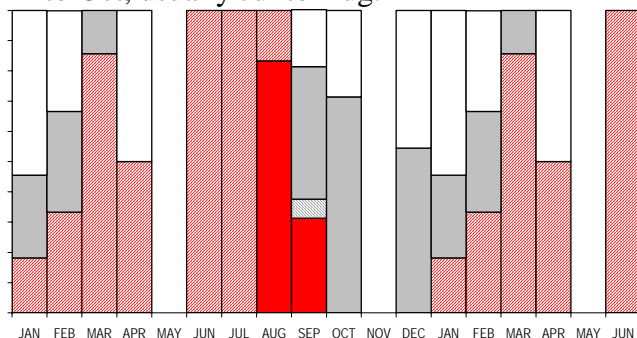
**Other Common Names:** Overberg Sugarbush.  
**Other Scientific Names:** *None*.

**75 Records**

**Population** (75 records): 1% Abundant, 16% Common, 47% Frequent, 35% Rare, 1% Extinct.

**Dispersion** (68 records): 50% variable, 44% clumped, 6% evenly distributed.

**Flowering** (74 records with: Jan 11, Feb 3, Mar 14, Apr 2, May 0, Jun 3, Jul 1, Aug 6, Sep 16, Oct 7, Nov 0, Dec 11): Buds from Feb to Jul; Flowering from Aug to Sep; Peak Flowering not recorded; Over not significant; Fruit from Sep to Feb; Nothing from Oct to Feb and Apr. Peak levels at 100% in Aug. Historically recorded as flowering from Jul to Oct, usually Jul to Aug.



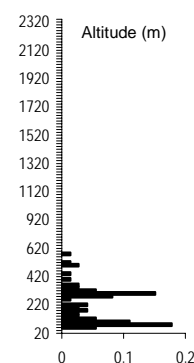
**Height** (74 records): 26% 0-0.2 m tall, 74% 0.2-1 m tall.

**Pollinators** (2 records): 100% mammals.  
**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (73 records): 100% inland - further than 2 km from coast.

**Altitude** (73 records): 40 - 580 m; 80<sub>lq</sub> - 120<sub>med</sub> - 280<sub>uq</sub>m.

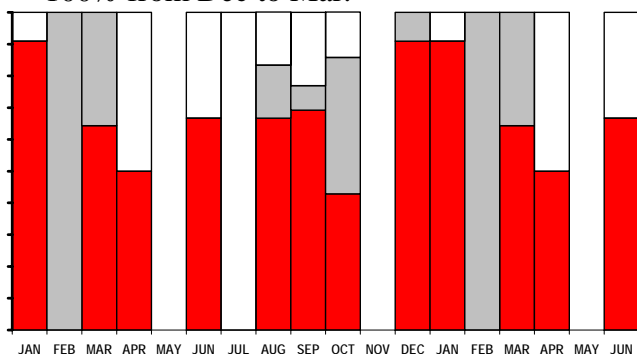


**Landform** (73 records): 96% deep soil, 3% shallow soil, 1% rocky outcrops.

**Slope** (73 records): 64% gentle incline, 18% platform, 12% steep incline, 5% hill top.

**Aspect** (63 records): 40% South, 33% North, 14% West, 13% East.

**Growth** (71 records with: Jan 11, Feb 3, Mar 14, Apr 2, May 0, Jun 3, Jul 1, Aug 6, Sep 13, Oct 7, Nov 0, Dec 11): Much from Mar to Jan; Rare from Feb to Mar and Oct; None from Apr to Jul and Sep. Peak levels at 100% from Dec to Mar.

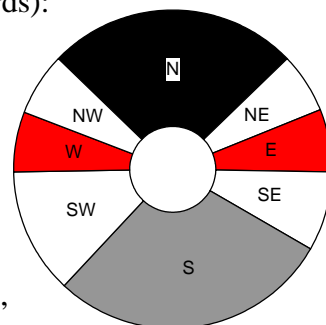


**Soil Type** (72 records): 42% loamy, 26% clayey, 17% gravelly, 15% sandy.

**Soil Colour** (70 records):

54% brown, 36% grey, 7% orange, 1% yellow, 1% red.

**Geology** (61 records): 38% shale, 31% silcrete or ferricrete, 15% conglomerate, 15% sandstone, 2% Tertiary sands.



**Vegetation** (73 records): 97% shrubland, 1% grassland, 1% plantations.

**Seedlings** (35 records): Absent in 83%: fewer seedlings than prefire adults in 2 cases, and more in 1 case. Seedlings found in Jan. Apr and Dec.

**Fire Survival** (5 records): 80% survived by seedlings only, 20% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 3 years, 50% estimated at 5-6 years, and 100% recorded at 8 years.

**Conservation Status and Threat:**

**Red Data List Status:** Endangered

B2a(i)b(i,ii,iii,iv,v).

**Occurrence** (Fynbos): 1 591 km<sup>2</sup> with 8% conserved and 34% lost; **Occupancy:** 97 km<sup>2</sup> with 19% conserved and 37% lost. **Fragmentation index:** 1%.

**Nature Reserves** (73 records): 22% in nature reserves.

**Habitat destruction** (73 records): 60% extensive natural habitat, 36% islands, 1% road verges, 1% naturally linear habitats, 1% naturally fragmented habitats.

**Alien Invasive Species** (73 records):  
47% Fabaceae (chiefly alien *Acacia*),  
29% none, 12% *Pinus*, 11% *Hakea*,  
1% Myrtaceae.

**Alien Density** (73 records): 29% alien-free,  
52% sparse, 19% abundant.

**Cultivation & Utilization:**

**Picking** (59 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (1%).

**Atlassers Notes:**

110 skeletons: 4 plants of next generation seen -  
2 dead. Probably cause - fire in wrong time  
of year? (AGR97010430); Very dry/ brown  
dying? (CHE98030501); Skeletons  
(IEBY1032202);

Only in unburned areas and road verges - in  
*Themeda* grass on edge of road forming a 0  
3m tall hedge of plants every 200mm with  
just new growth sticking out of tops of grass  
not much seeds - so will be wiped out by fire  
planned for later (AGRY1030728); Only in  
one patch of old veld (AGRY1030730); Only  
in fire-safe areas - verge and islands within  
veld (AGRY1030724); Along road verge  
(SGAY1030723);

Thousands of plants - leaves quite like *P.*  
*humiflora* but habit, habitat and giss all *P*  
*decurrrens* - No other patches around it have  
anything like this density - Nice mature  
plants (AGRY1030807);

Resprouting from bush cutting (APE92080326);

Grazed (AGR96081501);

More common at base of slope with more shales  
(AGR91122901);

**Confusing Species:** Occasionally confused  
with *P. subulifolia* which has rounded leaves  
and does not have the leaf blade continuing  
down the stem.

Records of identification queries = 3.

Records of corrected identification queries = 2.

**Variation and Taxonomy:** Populations in the  
east have slightly wider leaves than those in  
the west.

**Distribution:** Add.

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*Protea ericifolia* (Salisb. ex Kn) Rebelo 1809, 2008  
Erica-leaf Sugarbush

**Other Common Names:** Heath-leaf  
Pleuranthe.

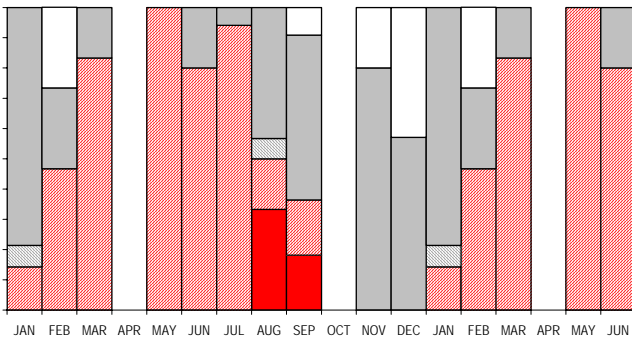
**Other Scientific Names:** *None*.

**134 Records**

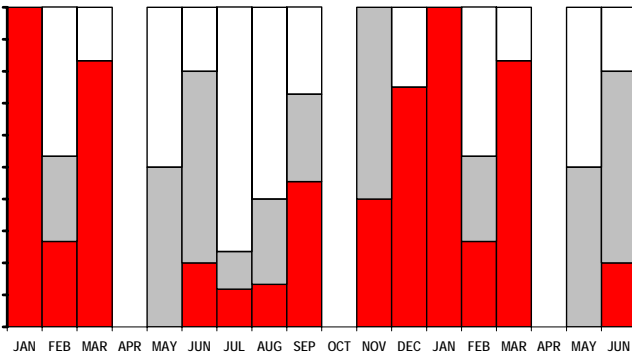
**Population** (131 records): 26% Common, 50% Frequent, 24% Rare.

**Dispersion** (104 records): 77% variable, 23% clumped.

**Flowering** (112 records with: Jan 14, Feb 15, Mar 6, Apr 0, May 2, Jun 5, Jul 17, Aug 30, Sep 11, Oct 0, Nov 5, Dec 7): Buds from Feb to Jul; Flowering from Aug; Peak Flowering not recorded; Over not significant; Fruit from Aug to Feb and Jun; Nothing from Feb and Nov to Dec. Peak levels at 57% in Aug. Historically recorded as flowering from Jul to Oct.



**Growth** (113 records with: Jan 14, Feb 15, Mar 6, Apr 0, May 2, Jun 5, Jul 17, Aug 30, Sep 11, Oct 0, Nov 5, Dec 8): Much from Sep to Mar and Jun; Rare from Feb, May to Jun and Aug to Nov; None from Feb, May to Sep and Dec. Peak levels at 100% in Jan.



**Seedlings** (52 records): All without any seedlings present.

**Fire Survival** (2 records): 100% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 100% at 4 years.



**Height** (113 records): 8% 0-0.2 m tall, 90% 0.2-1 m tall, 2% 1-2 m tall.

**Pollinators** (4 records): 75% mammals, 25% beetles.

**Detailed Pollinators:** No additional data.

**Habitat:**

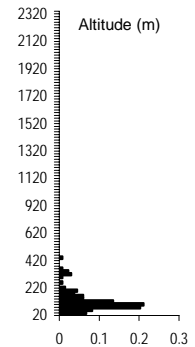
**Distance to Ocean** (133 records): 100% inland - further than 2 km from coast.

**Altitude** (133 records): 20 - 440 m; 60<sub>lq</sub> - 80<sub>med</sub> - 80<sub>uq</sub>m.

**Landform** (114 records): 95% deep soil, 4% shallow soil, 2% riverine.

**Slope** (114 records): 61% gentle incline, 26% platform, 7% valley bottom, 4% hill top, 0.9% steep incline.

**Aspect** (85 records): 34% North, 26% West, 24% South, 17% East.

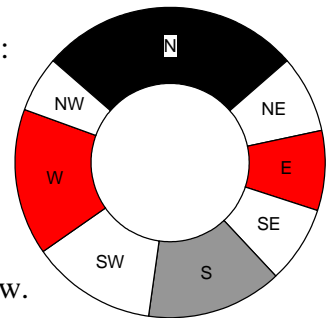


**Soil Type** (114 records): 43% loamy, 29% clayey, 24% sandy, 4% gravelly.

**Soil Colour** (114 records): 57% brown, 31% grey, 4% white, 4% orange, 3% yellow.

**Geology** (122 records): 47% shale, 30% silcrete or ferricrete, 21% sandstone.

**Vegetation** (133 records): 99% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Endangered A4c. Occurrence (Fynbos): 1 031 km<sup>2</sup> with 3% conserved and 37% lost; Occupancy: 178 km<sup>2</sup> with 8% conserved and 38% lost. Fragmentation index: 16%.

**Nature Reserves** (133 records): 12% in nature reserves - inadequately conserved.

**Habitat destruction** (115 records): 67% extensive natural habitat, 17% road verges, 13% islands, 2% naturally fragmented habitats.

**Alien Invasive Species** (113 records): 60% Fabaceae (chiefly alien *Acacia*), 16% *Pinus*, 11% Myrtaceae, 7% none, 4% *Hakea*, 2% other aliens.

**Alien Density** (113 records): 7% alien-free, 59% sparse, 23% abundant, 10% dense.

**Cultivation & Utilization:**

**Picking** (95 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 3 records (2%).

**Atlassers Notes:**

**Leaf length**

6mm (NGF97081602, NGF97081703); 8mm (AGR97081603)

**Confusing Species:** Originally included with *P. subulifolia*, until it was realized that there was not a continuous variation in leaf length, but a distinct difference about Bot River.  
Records of identification queries = 132.

Records of corrected identification queries = 132.

**Variation and Taxonomy:** This is the short-leaf form of *P. subulifolia*. It is confined to the Bokkeveld Shale clayey soils, and has very short (< 10mm long), ericoid leaves that clasp the stem. It also has pale pinkish brown (not dark brown to purple-black) involucre bracts.

**Distribution:** Add.

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*Protea humiflora* Andrews 1803

**Patent-leaf Sugarbush**

*Rottesuikerbos*

**Other Common Names:** Grass Protea, Grass-leaf Sugarbush, Ground Sugarbush, Prickly Protea, Wood-leaf Pleuranthe, *Grassuikerbos*.

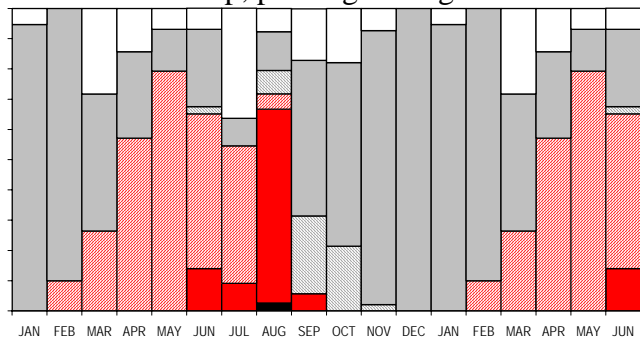
**Other Scientific Names:** *glastifolia* (Salisb. ex Knight) 1809, *humiflorens* Willd 1814, *humifusa* Hort ex Meisn 1856, *humilis* RBr 1810.

**443 Records**

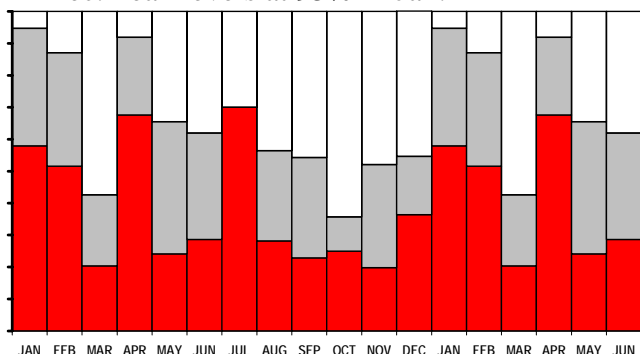
**Population** (439 records): 22% Common, 54% Frequent, 23% Rare.

**Dispersion** (391 records): 69% variable, 28% clumped, 2% widespread, 2% evenly distributed.

**Flowering** (429 records with: Jan 19, Feb 30, Mar 53, Apr 35, May 29, Jun 43, Jul 11, Aug 39, Sep 35, Oct 28, Nov 96, Dec 11): Buds from Mar to Jul; Flowering from Aug; Peak Flowering not significant; Over from Sep to Oct; Fruit from Sep to Apr and Jun; Nothing from Mar and Jul. Peak levels at 80% in Aug. Historically recorded as flowering from Jul to Sep, peaking in Aug.



**Growth** (431 records with: Jan 19, Feb 31, Mar 54, Apr 37, May 29, Jun 42, Jul 10, Aug 39, Sep 35, Oct 28, Nov 96, Dec 11): Much from all year round; Rare from Jan to Jun, Aug to Sep and Nov; None from Mar and May to Dec. Peak levels at 95% in Jan.



**Seedlings** (217 records): Absent in 99%: fewer seedlings than prefire adults in 1 case. Seedlings found in Nov.

**Fire Survival** (4 records): 50% survived by seedlings only, 50% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 7 years, 50% estimated at 6-7 years, and 100% recorded at 7 years.



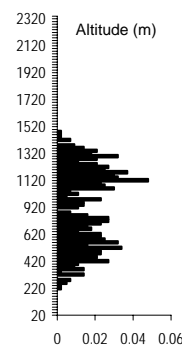
**Height** (433 records): 91% 0.2-1 m tall, 7% 1-2 m tall.

**Pollinators** (3 records): 100% mammals. **Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (438 records): 100% inland - further than 2 km from coast.

**Altitude** (438 records): 200 - 1380 m; 540<sub>lq</sub> - 760<sub>med</sub> - 1040<sub>uq</sub> m.



**Landform** (435 records): 47% deep soil, 47% shallow soil, 6% rocky outcrops.

**Slope** (435 records): 54% gentle incline, 33% steep incline, 9% hill top, 3% platform.

**Aspect** (402 records): 44% South, 29% North, 16% East, 11% West.

**Soil Type** (431 records):

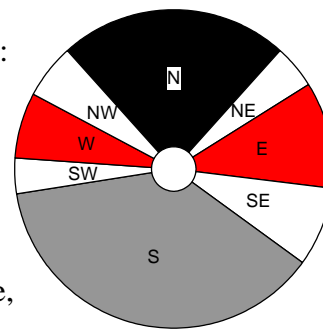
30% sandy, 23% loamy, 23% rocky, 20% gravelly, 4% clayey.

**Soil Colour** (430 records):

49% brown, 38% grey, 7% orange, 3% yellow, 1% red.

**Geology** (344 records): 79% sandstone, 21% shale.

**Vegetation** (433 records): 100% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 3 477 km<sup>2</sup> with 22% conserved and 3% lost; **Occupancy:** 540 km<sup>2</sup> with 21% conserved and 3% lost. **Fragmentation index:** 5%.

**Nature Reserves** (438 records): 23% in nature reserves.

**Habitat destruction** (433 records): 95% extensive natural habitat, 2% naturally linear habitats, 2% islands, 1% naturally fragmented habitats.

**Alien Invasive Species** (433 records): 90% none, 5% *Hakea*, 2% Fabaceae (chiefly alien *Acacia*), 1% *Pinus*.

**Alien Density** (432 records): 90% alien-free, 9% sparse.



**Cultivation & Utilization:**

**Picking** (350 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 16 records (4%).

**Atlassers Notes:**

Odd plants with a few terminal flowerheads (AGRY3111918);

Densist population i've ever seen over 5000 plants (AGRY0041208);

2 dead by old age (AGRY3111833); 1/3 of plants dead this fire cycle (AGRY1012909);

Several dead plants found in the area - died of old age? (DOA94011801-2); Also a few dead plants (DOA94080404); Many dead plants also (SMR99080903);

Looked as if they were only just surviving (DOA94022307);

Strong yeasty odour (EGH94071302);

Judging from state of open flowers they are heavily visited by rodents flowers are chewed ! (CBE93071701); Undoubtedly mouse pollinated (EGH94071302); Growing in linear band along shale/sandstone contact (NAH98102502); Almost all with Witches Broom (AMMY1012903);

**Confusing Species:** None noted.  
Records of identification queries = 3.

**Variation and Taxonomy:** None recorded or observed.

**Distribution:** Add.

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*Protea subulifolia* (Salisb. ex Kn.) Rourke 1809, 1974

**Awl-leaf Sugarbush**

*Naaldblaarsuikerbos*

**Other Common Names:** Awl-leaf Pleuranthe, Needle-leaf Sugarbush, *Naelblaarsuikerbos*.

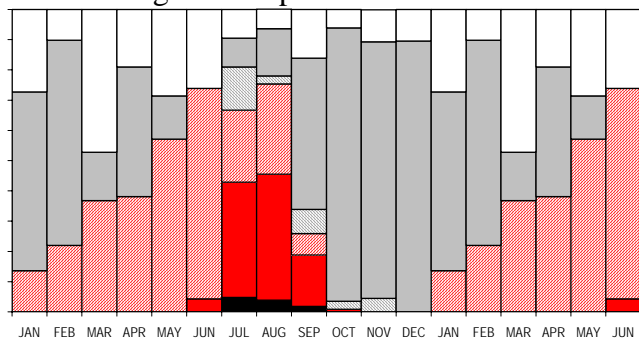
**Other Scientific Names:** *acerosa* RBr 1810, *ericaefolia* Salisb. ex Knight 1809, *virgata* Andr 1803.

**717 Records**

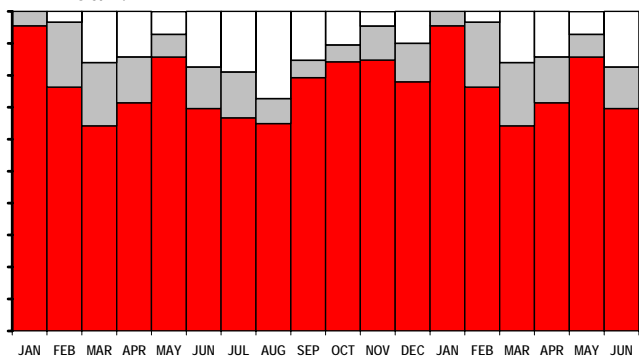
**Population** (710 records): 23% Common, 55% Frequent, 20% Rare.

**Dispersion** (638 records): 74% variable, 24% clumped, 2% widespread, 0.2% evenly distributed.

**Flowering** (706 records with: Jan 44, Feb 59, Mar 106, Apr 21, May 14, Jun 23, Jul 21, Aug 77, Sep 112, Oct 115, Nov 66, Dec 48): Buds from Feb to Aug; Flowering from Jul to Aug; Peak Flowering and Over from not significant; Fruit from Sep to Feb and Apr; Nothing from Jan and Mar to Jun. Peak levels at 81% in Jul. Historically recorded as flowering from Sep to Oct.



**Growth** (706 records with: Jan 44, Feb 59, Mar 106, Apr 21, May 14, Jun 23, Jul 21, Aug 77, Sep 111, Oct 114, Nov 66, Dec 50): Much from all year round; Rare from Feb to Mar; None from Jul to Aug. Peak levels at 100% in Jan.

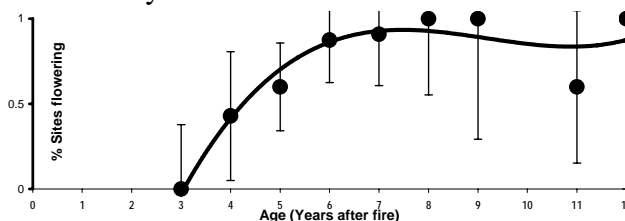


**Seedlings** (286 records): Absent in 97%: fewer seedlings than prefire adults in 1 case, and more in 3 cases. Seedlings found in Feb, Mar, Sep and Dec.

**Fire Survival** (25 records): 48% survived by seedlings only, 40% resprouted from underground boles, 12% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4-5 years, and

100% recorded at 8 years, with senescence after 20 years.



**Height** (711 records): 12% 0-0.2 m tall, 87% 0.2-1 m tall, 1% 1-2 m tall.

**Pollinators** (9 records): 78% mammals, 11% bees or wasps, 11% beetles.

**Detailed Pollinators** (2 records): Honey Bee, Ground Beetle.

**Habitat:**

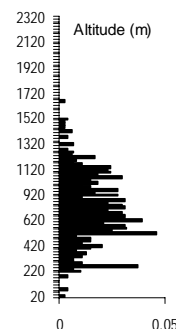
**Distance to Ocean** (710 records): 100% inland - further than 2 km from coast.

**Altitude** (710 records): 60 - 1560 m; 500 *lq* - 660 *med* - 820 *uq*m.

**Landform** (706 records): 83% deep soil, 13% shallow soil, 4% rocky outcrops.

**Slope** (708 records): 53% gentle incline, 37% steep incline, 6% hill top, 2% platform.

**Aspect** (655 records): 33% North, 33% South, 22% East, 12% West.

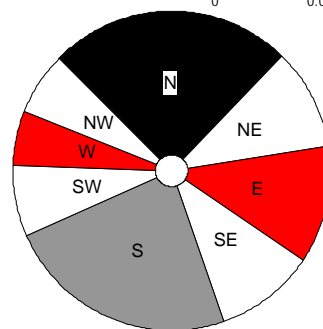


**Soil Type** (704 records): 38% sandy, 34% loamy, 13% gravelly, 9% clayey, 6% rocky.

**Soil Colour** (702 records): 45% brown, 43% grey, 6% orange, 2% white, 2% yellow, 1% black, 1% red.

**Geology** (700 records): 73% sandstone, 23% shale, 2% silcrete or ferricrete, 1% granite.

**Vegetation** (709 records): 98% shrubland, 1% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern. Occurrence (Fynbos): 4 371 km<sup>2</sup> with 28% conserved and 17% lost; Occupancy: 544 km<sup>2</sup> with 25% conserved and 9% lost. Fragmentation index: 5%.

**Nature Reserves** (710 records): 19% in nature reserves - inadequately conserved.

**Habitat destruction** (702 records):  
93% extensive natural habitat, 6% islands,  
1% naturally linear habitats.

**Alien Invasive Species** (693 records):  
36% none, 30% *Pinus*, 29% *Hakea*,  
4% Fabaceae (chiefly alien *Acacia*),  
1% Myrtaceae.

**Alien Density** (692 records): 36% alien-free,  
55% sparse, 7% abundant, 2% dense.

**Cultivation & Utilization:**

**Picking** (533 records): 100% no sign of  
picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 3 records (0.4%).

**Atlassers Notes:**

**Leaf length**

10-12mm (AGR97091106); 15mm  
(AGR95040307-8); 20-35mm  
(NAH96110201); 35mm (AGRY6020803);  
40-50mm (GEDY0062801); 60mm  
(AMMY3103125,27,31,32);

Very short leaves here unlike the eastern  
Riviersonderend Mountains and like the  
Bredasdorp Plain (NGFY1081101);

**Other**

Had flowers at base (axillary) and also terminal  
flowers (CHE96082101);

Has new soft growth regardless of flowers buds  
or nothing! (AWA95091903);

Flowerheads chewed off (SHR91092102); Not  
picked but much eaten / bits of heads  
scattered around (SMR98112501);

Frequent skeletons found no seedlings or small  
plants (AGRY0090703);

You wont believe how many plants there are in  
this area from river banks to top of mt they  
grow in clumps of 10-30 in a wide belt  
(VJK93082901); Appear to grow in narrow  
belts (VJK97070102);

Drought stress (WIJY0112609);

Bad Witches Broom infection  
(AGRY1020129);

**Confusing Species:** Mostly confused with *P.*  
*decurrens*, which has flat leaves with a blade  
that continues down the stem. A single  
misidentification with *P. pityphilla* from a  
population not in flower.

Records of identification queries = 24.

Records of corrected identification queries = 12.

**Variation and Taxonomy:** Leaf length varies  
between populations from 10-60mm long.  
Although it has been stated that leaf length  
varies with rainfall, this is not true taking  
into account the newly discovered  
populations on the Langeberg. The variation  
in leaf length may well give insights into  
sub-speciation within this species.  
Flowerheads have dark brown to puplish  
involucral bracts.

**Distribution:** Add.

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## *Protea subulifolia* "Woeska" Woeska Sugarbush

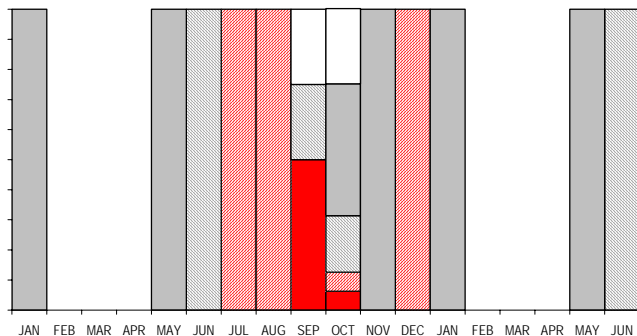
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

### 38 Records

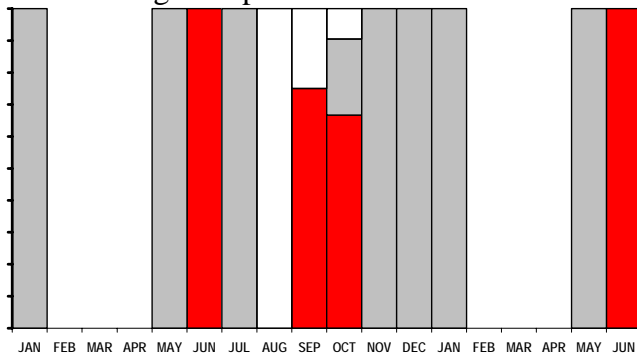
**Population** (38 records): 24% Common, 63% Frequent, 13% Rare.

**Dispersion** (36 records): 67% variable, 28% clumped, 6% evenly distributed.

**Flowering** (33 records with: Jan 1, Feb 0, Mar 0, Apr 0, May 1, Jun 1, Jul 4, Aug 1, Sep 4, Oct 16, Nov 4, Dec 1): Buds from Jul to Aug; Flowering from Sep; Peak Flowering not recorded; Over from Sep to Oct; Fruit from Oct to May; Nothing from Sep to Oct. Peak levels unreliable. No historical records.



**Growth** (37 records with: Jan 1, Feb 0, Mar 0, Apr 0, May 1, Jun 1, Jul 3, Aug 1, Sep 4, Oct 21, Nov 4, Dec 1): Much from Jun and Sep to Oct; Rare from Oct to May and Jul; None from Aug to Sep. Peak levels unreliable.



**Seedlings** (18 records): All without any seedlings present.

**Fire Survival** (2 records): 100% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 100% at 6 years,.



**Height** (38 records): 16% 0-0.2 m tall, 84% 0.2-1 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

### Habitat:

**Distance to Ocean** (38 records): 100% inland - further than 2 km from coast.

**Altitude** (38 records): 200 - 660 m; 300<sub>lq</sub> - 320<sub>med</sub> - 320<sub>uq</sub>m.

### Landform

61% deep soil, 39% shallow soil.

**Slope** (38 records): 66% gentle incline, 29% steep incline, 3% hill top, 3% platform.

### Aspect

38% South, 35% North, 15% West, 13% East.

### Soil Type

46% sandy, 35% gravelly, 14% loamy, 5% rocky.

**Soil Colour** (36 records): 69% grey, 14% brown, 14% white, 3% orange.

**Geology** (38 records): 87% sandstone, 13% shale.

**Vegetation** (38 records): 97% shrubland, 3% thicket.

### Conservation Status and Threat:

**Red Data List Status:** Near Threatened D2(ii). Occurrence (Fynbos): 152 km<sup>2</sup> with 33% conserved and 1% lost; Occupancy: 37 km<sup>2</sup> with 16% conserved and 0% lost. Fragmentation index: 24%.

**Nature Reserves** (38 records): 5% in nature reserves - inadequately conserved.

### Habitat destruction

97% extensive natural habitat, 3% islands.

**Alien Invasive Species** (35 records): 43% none, 37% Fabaceae (chiefly alien *Acacia*), 20% *Hakea*.

**Alien Density** (34 records): 44% alien-free, 53% sparse, 3% impenetrable.

### Cultivation & Utilization:

**Picking** (23 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (3%).

### Atlasers Notes:

None.

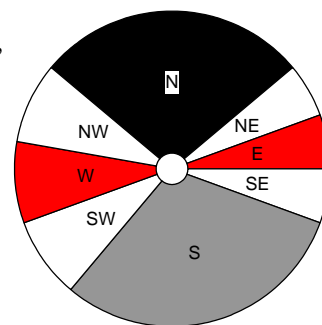
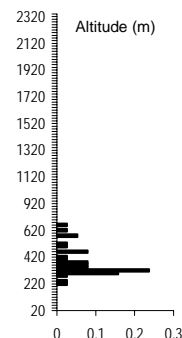
**Confusing Species:** This species was variously identified at the Compton Herbarium as *P. subulifolia* and *P. decurrens*. Atlasers similarly confused it with both species.

Records of identification queries = 37.

Records of corrected identification queries = 37.

**Variation and Taxonomy:** None noted.

**Distribution:** Add.



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*Protea aristata* Phill. 1938

**Ladismith Sugarbush**

*Kleindennesuikerbos*

**Other Common Names:** Ambassador Sugarbush, Christmas Sugarbush, Pine-leaf Protea, Small-pine Sugarbush, *Kleindensuikerbos*, *Krismisprotea*, *Swartbergsuikerbos*.

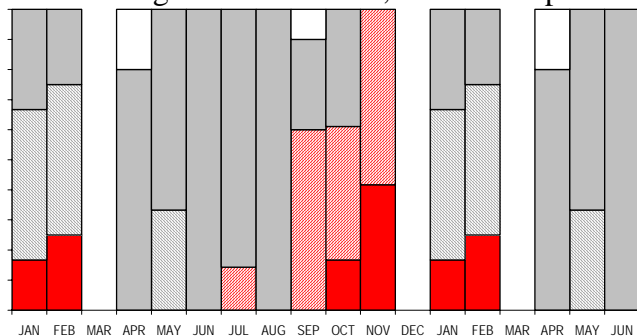
**Other Scientific Names:** *None*.

**82 Records**

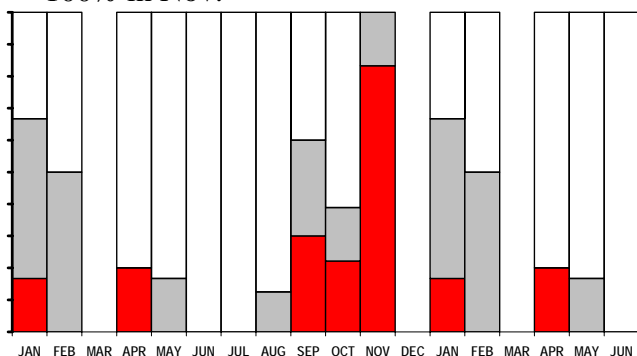
**Population** (78 records): 1% Common, 44% Frequent, 55% Rare.

**Dispersion** (62 records): 68% clumped, 29% variable, 3% widespread.

**Flowering** (79 records with: Jan 6, Feb 4, Mar 0, Apr 5, May 6, Jun 3, Jul 7, Aug 8, Sep 10, Oct 18, Nov 12, Dec 0): Buds from Sep to Nov; Flowering from Nov to Feb; Peak Flowering not recorded; Over from Jan to Feb and May; Fruit from all year round; Nothing from Apr. Peak levels unreliable at 100% in Nov. Historically recorded as flowering from Oct to Feb, with a Dec peak.



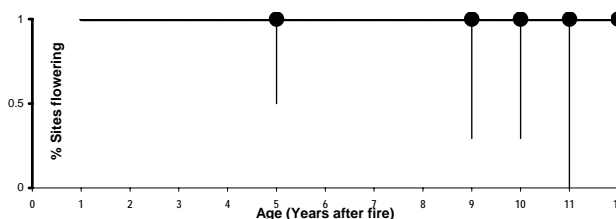
**Growth** (79 records with: Jan 6, Feb 4, Mar 0, Apr 5, May 6, Jun 3, Jul 7, Aug 8, Sep 10, Oct 18, Nov 12, Dec 0): Much from Sep to Nov; Rare from Jan to Feb and Sep; None from Jan to Oct. Peak levels unreliable at 100% in Nov.



**Seedlings** (11 records): Absent in 64%: fewer seedlings than prefire adults in 1 case, and more in 1 case. Seedlings found in Sep and Oct.

**Fire Survival** : No data.

**Age to first flowering**:. First flowers recorded at 5 years, all records being 100%.



**Height** (81 records): 41% 0.2-1 m tall, 56% 1-2 m tall, 4% 2-5 m tall.

**Pollinators** (1 record): 100% birds.

**Detailed Pollinators** (2 records): Malachite Sunbird, Cape Sugarbird.

**Habitat**:

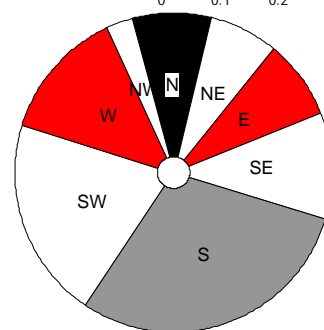
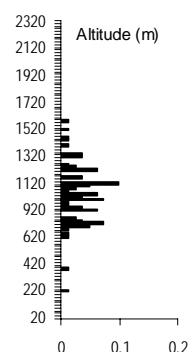
**Distance to Ocean** (78 records): 100% inland - further than 2 km from coast.

**Altitude** (78 records): 600 - 1480 m; 800 *lq* - 920 *med* - 1020 *uq*m.

**Landform** (78 records): 71% shallow soil, 26% rocky outcrops, 4% deep soil.

**Slope** (78 records): 73% steep incline, 13% cliff, 12% gentle incline, 1% hill top, 1% valley bottom.

**Aspect** (71 records): 44% South, 26% West, 18% East, 12% North.



**Soil Type** (77 records): 81% sandy, 10% rocky, 5% loamy, 4% gravelly.

**Soil Colour** (76 records): 64% brown, 28% grey, 4% orange, 3% yellow, 1% white.

**Geology** (78 records): 100% sandstone.

**Vegetation** (78 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable C2a(i).

**Occurrence** (Fynbos): 333 km<sup>2</sup> with 45% conserved and 0% lost; **Occupancy:** 109 km<sup>2</sup> with 39% conserved and 2% lost.

**Fragmentation index:** 28%.

**Nature Reserves** (78 records): 59% in nature reserves - well conserved.

**Habitat destruction** (74 records): 99% extensive natural habitat, 1% naturally linear habitats.

**Alien Invasive Species** (75 records): 96% none, 4% *Hakea*.

**Alien Density** (75 records): 96% alien-free, 4% sparse.

**Cultivation & Utilization:**

**Picking** (74 records): 100% no sign of picking.

**Cultivation Status:** Plantings - 3 records (4%).

**Atlassers Notes:**

These plants have escaped the last few fires and must be relatively old - about 30 years? (DOA93042810);

About 15 plants (DOA94100602); There are 46 plants in this group (FPA91101501);

This plant grows right next to the road at the bottom of a cliff this must be the smallest

plot you have received so far (AWA99052101);

**Confusing Species:** None noted.  
Records of identification queries = 1.

**Variation and Taxonomy:** None known.

**Distribution:** Add.

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*Protea lanceolata* Meyer ex Meisn. 8156

**Lance-leaf Sugarbush**

*Smalblaarsuikerbos*

**Other Common Names:** Small-white Sugarbush, Unfinished Protea, *Kerstolbos*, *Onvoltooidesuikerbos*.

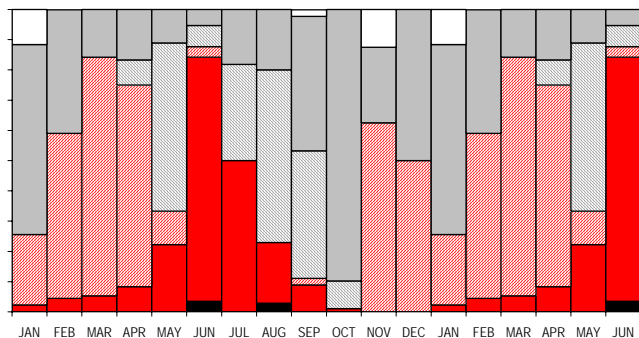
**Other Scientific Names:** *None*.

**367 Records**

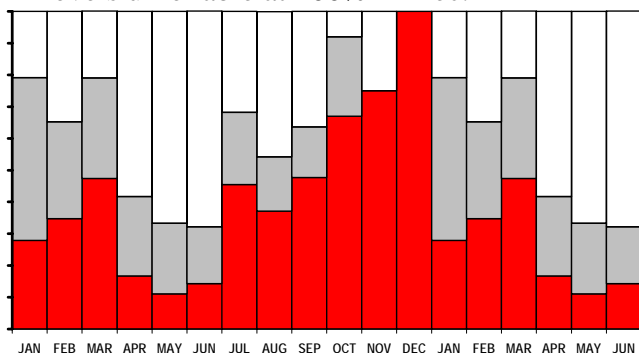
**Population** (354 records): 1% Abundant, 28% Common, 52% Frequent, 19% Rare.

**Dispersion** (323 records): 51% clumped, 46% variable, 2% evenly distributed, 2% widespread.

**Flowering** (362 records with: Jan 43, Feb 22, Mar 19, Apr 12, May 9, Jun 57, Jul 22, Aug 35, Sep 45, Oct 88, Nov 8, Dec 2): Buds from Nov to Apr; Flowering from May to Aug; Peak Flowering not significant; Over from May and Jul to Sep; Fruit from Aug to Feb; Nothing not significant. Peak levels at 95% in Jun. Historically recorded as flowering from Apr to Oct, peaking in May to Jul.



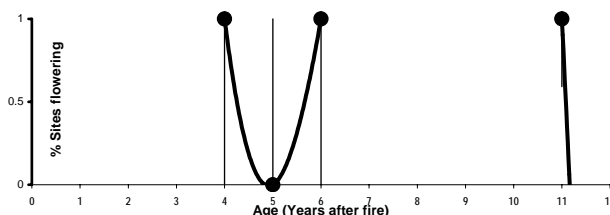
**Growth** (361 records with: Jan 43, Feb 23, Mar 19, Apr 12, May 9, Jun 56, Jul 22, Aug 35, Sep 44, Oct 88, Nov 8, Dec 2): Much from Jul to Mar; Rare from Jan to May, Jul and Oct; None from Jan to Sep and Nov. Peak levels unreliable at 100% in Dec.



**Seedlings** (129 records): Absent in 94%: fewer seedlings than prefire adults in 2 cases, and more in 2 cases. Seedlings found in Jun, Oct (2) and Nov.

**Fire Survival** (7 records): 71% survived by seedlings only, 14% eliminated from the area by fires, 14% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 4 years, 50% estimated at less than 4 years, and 100% recorded by 6 years.



**Height** (363 records): 0.3% 0-0.2 m tall, 9% 0.2-1 m tall, 47% 1-2 m tall, 42% 2-5 m tall.

**Pollinators** (4 records): 50% birds, 50% bees or wasps.

**Detailed Pollinators** (3 records): Southern Double-collared Sunbird, Honey Bee, Cape Sugarbird.

**Habitat:**

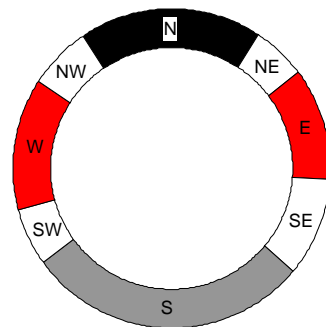
**Distance to Ocean** (352 records): 83% inland - further than 2 km from coast.

**Altitude** (352 records): 40 - 500 m; 120 *lq* - 160 *med* - 160 *uq*m.

**Landform** (351 records): 91% deep soil, 9% shallow soil, 0.6% rocky outcrops.

**Slope** (351 records): 48% gentle incline, 20% platform, 20% hill top, 6% dunes, 5% steep incline, 1% valley bottom.

**Aspect** (207 records): 38% South, 25% North, 20% West, 17% East.



**Soil Type** (346 records): 61% sandy, 32% loamy, 3% gravelly, 1% clayey, 1% rocky.

**Soil Colour** (344 records): 59% brown, 21% grey, 7% red, 6% yellow, 4% orange, 2% white, 1% black.

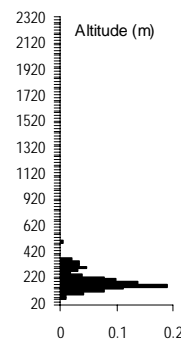
**Geology** (344 records): 40% limestone, 21% Tertiary sands, 18% sandstone, 8% silcrete or ferricrete, 6% granite, 4% conglomerate, 4% shale.

**Vegetation** (351 records): 97% shrubland, 1% thicket.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern, but granite-silcrete form is Endangered A2c, B1b(i,ii)c(iv)+2b(i,ii)c(iv).

**Occurrence** (Fynbos): 2 267 km<sup>2</sup> with 4% conserved and 24% lost; **Occupancy:** 434 km<sup>2</sup> with 8% conserved and 17% lost. **Fragmentation index:** 11%.



**Nature Reserves** (352 records): 14% in nature reserves - inadequately conserved.

**Habitat destruction** (342 records): 70% extensive natural habitat, 21% islands, 5% road verges, 2% naturally fragmented habitats, 1% naturally linear habitats.

**Alien Invasive Species** (332 records): 71% Fabaceae (chiefly alien *Acacia*), 25% none, 2% *Pinus*.

**Alien Density** (330 records): 25% alien-free, 54% sparse, 12% abundant, 8% dense, 2% impenetrable.

**Cultivation & Utilization:**

**Picking** (255 records): 100% no sign of picking.

**Cultivation Status:** Plantings - 13 records (4%), Augmentations - 1 record (0.3%).

**Witch's Broom Infestation:** 47 records (13%).

**Atlassers Notes:**

Seems larger: perianth 71mm long (AGRY3080819);

A fair amount of Witches Broom (DOA96100821); Lots of Witches Broom (DOA96100822);

**Confusing Species:** *Protea lanceolata* is similar to the White Water Proteas and thus relatively easily confused with them. The majority of misidentifications were with *P. mundii* (with slightly longer and wide leaves)

and a case of *P. laticolor* (with much wider leaves with a truncate or cordate base). In flower though it is unmistakable, with bracts that collapse (like *P. aurea*) with exposed but short flowers. In fruit often causes novices extreme confusion until one realizes that the *Leucadendron*-like cones are in fact protea seedheads and a diagnostic feature.

Records of identification queries = 11.

Records of corrected identification queries = 6.

**Variation and Taxonomy:** This species is unique in Proteaceae in occurring on totally disparate geologies calcareous-neutral sands and granitic soils and Tertiary gravels and ferricretes. Superficially there is no difference, and no attempt has been made to see if finer features are also identical. Indeed it is described as very uniform and displaying little variability. Atlassers have suggested that on the heavier soils the plants sometimes exceed the published sizes for the species.

**Distribution:** Add.

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*Protea repens* (L.) L. 1737, 1771  
**Common (Cape) Sugarbush**  
*Suikerbos*

**Other Common Names:** Cape Honey Flower, Honey Sugarbush, Melliferous Erodendrum, Real Sugarbush, Repens, Sugarbush, True Sugarbush, Yellow Sugarbush, *Echter Zucherbusch*, *Zuckerprotea*, *Bierbos*, *Geelsuikerbos*, *Mebos*, *Opregtesuikerbos*, *Perdebos*, *Soetsopbos*, *Stroopbos*, *Suikerkan*, *Tulpboom*, *Waboom*, *Waresuikerbos*, *isiQuane* (Xhosa), *Honeyglow*, *Ruby Blush*, *Valentine*.

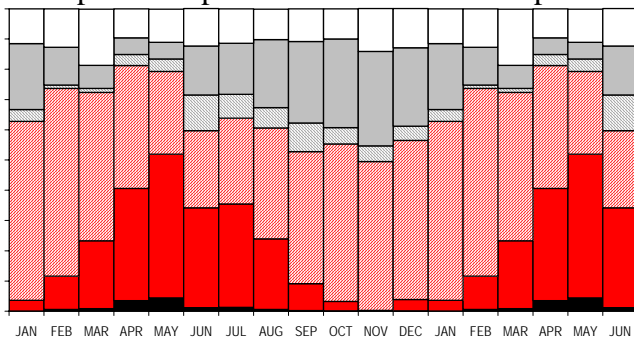
**Other Scientific Names:** *mellifera* Thunb 1781, *mellifluum* Salisb. ex Knight 1809.

**15512 Records**

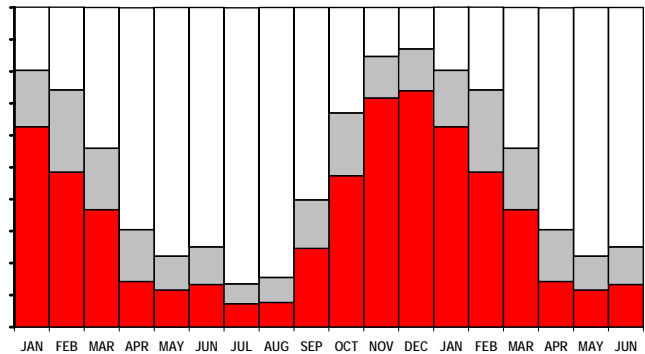
**Population** (15290 records): 1% Abundant, 31% Common, 51% Frequent, 15% Rare.

**Dispersion** (13725 records): 72% variable, 19% clumped, 8% widespread, 1% evenly distributed.

**Flowering** (14941 records with: Jan 1065, Feb 1189, Mar 1413, Apr 1185, May 996, Jun 919, Jul 922, Aug 1439, Sep 1522, Oct 1923, Nov 1491, Dec 877): Buds from all year round; Flowering from Mar to Aug; Peak Flowering, Over and Nothing not significant;; Fruit from Aug to Jan; - this is consistent with buds being produced a year before flowering, and thus superseding the "fruiting" code. Peak levels at 85% in Apr. Historically recorded as flowering from all year round, May to Oct in the southwestern Cape and Sep to Mar in the eastern Cape.



**Growth** (14739 records with: Jan 1063, Feb 1176, Mar 1397, Apr 1157, May 975, Jun 917, Jul 898, Aug 1422, Sep 1486, Oct 1906, Nov 1474, Dec 868): Much from Sep to Mar; Rare from Feb and Oct; None from Jan to Oct. Peak levels at 87% in Dec.



**Seedlings** (6149 records): Absent in 89%; fewer seedlings than prefire adults in 177 cases, and more in 154 cases. Seedlings found in Jan (23), Feb (10), Mar (39), Apr (28), May (27), Jun (27), Jul (20), Aug (41), Sep (36), Oct (25), Nov (40) and Dec (15).

**Fire Survival** (887 records): 65% survived by seedlings only, 20% eliminated from the area by fires, 15% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded at 18 years.



**Height** (15060 records): 3% 0-0.2 m tall, 37% 0.2-1 m tall, 53% 1-2 m tall, 7% 2-5 m tall.

**Pollinators** (388 records): 61% birds, 26% bees or wasps, 9% beetles, 1% flies, 1% mites, 1% none observed, 0.3% butterflies or moths.

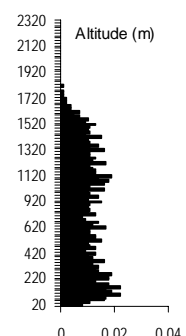
**Detailed Pollinators** (272 records): Cape Sugarbird (105), Orange-breasted Sunbird (73), Honey Bee (45), Malachite Sunbird (22), Monkey Beetle (6), Great Protea Beetle (6), Solitary Bee (4), Vinegar Fly (2), Southern Double-collared Sunbird (2), Scarab Beetle (2), Red-winged Starling (2), Wasp (unspecified), Cape Bulbul, Amethyst Sunbird.

**Habitat:**

**Distance to Ocean** (15157 records): 95% inland - further than 2 km from coast.

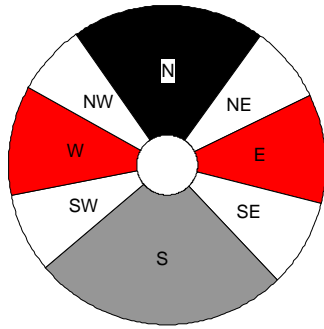
**Altitude** (15157 records): 20 - 2000 m; 300 *lq* - 720 *med* - 1060 *uq*m.

**Landform** (14936 records): 66% deep soil, 29% shallow soil, 4% rocky outcrops.



**Slope** (14932 records): 50% gentle incline, 33% steep incline, 8% platform, 6% hill top, 2% valley bottom.

**Aspect** (13149 records): 35% South, 27% North, 19% East, 19% West.



**Soil Type** (14841 records): 49% sandy, 27% loamy, 11% gravelly, 9% rocky, 4% clayey.

**Soil Colour** (14795 records): 43% grey, 42% brown, 5% orange, 4% white, 3% yellow, 2% black, 1% red.

**Geology** (14604 records): 77% sandstone, 12% shale, 4% granite, 3% Tertiary sands, 2% silcrete or ferricrete, 2% limestone.

**Vegetation** (15085 records): 98% shrubland.

### Conservation Status and Threat:

**Red Data List Status:** Least Concern. Occurrence (Fynbos): 48 821 km<sup>2</sup> with 22% conserved and 19% lost; Occupancy: 11 530 km<sup>2</sup> with 31% conserved and 16% lost. Fragmentation index: 6%.

**Nature Reserves** (15157 records): 40% in nature reserves.

**Habitat destruction** (14634 records): 90% extensive natural habitat, 6% islands, 2% road verges, 1% naturally linear habitats.

**Alien Invasive Species** (14419 records): 51% none, 20% *Pinus*, 16% Fabaceae (chiefly alien *Acacia*), 10% *Hakea*, 2% Myrtaceae.

**Alien Density** (14354 records): 51% alien-free, 37% sparse, 8% abundant, 3% dense.

### Cultivation & Utilization:

**Picking** (10707 records): 96% no sign of picking, 3% lightly picked, 0.8% severely picked.

**Cultivation Status:** Plantings - 107 records (0.7%), Augmentations - 19 records (0.1%), Escapes - 12 records (0.08%).

**Witch's Broom Infestation:** 6 records (0.04%).

### Atlassers Notes:

#### Variation

One pink red bush flowering amidst abundant whites (CBE92050302); White variety dominant (JCJ97030101, JCJ97032101); White form (NAH92050303, SHR93052201, WEL94050102, WMP98050102, WMP98050301, VJK93031401); Very large pure white flowers (OUT94061101); Nice yellow form! (AGR96052518); Yellow form (SDP93072401); Pink and white form (SJJ93042301-2); Red flowers (LKAY0051405); The most beautiful dark pink inflorescences (VJK96060205); 99% white - off white base to pink tips (WMP98050312);

With long leaf form : too short for *P. longifolia* but very variable! (AGR93081201-12);

Some with leaves barely 3mm wide - very narrow! (AGRY1020106); Very narrow leaves (AGRY2041929-30)

Small leaves (AGRY2070618); Unusual small leaves most leaves had burnt tips - stressed ? (IEBY0032908);

True creeping plants (APE92060702); These plants were exceptionally tall sturdy and healthy - the flowers were the largest we have seen (OUT94050704);

### Flowering

This seems to be too high to allow plants to flower - no flowers on these plants despite their age (AGRY5100110); Too high: no flowers - all in patch that survived previous fire - and even so have still not yet flowered in over 15 year old veld - still small plants (AGRY6020801); Still not flowered (AGRY6020803);

Most buds have been aborted (AGR92082503); Did not really flower this season it would appear that conditions were too dry during budding (AMA93061701); Buds all aborted there were very occasional flowers (SMR99080701); Had started flower buds but most had aborted (SMRY0032904); Aborted buds probably more than 50% - no cones evident from previous years (VCH99041403); Buds dead / aborted (WMP99080902);

A few plants are flowering - unusual for this time of year (DOA93081301);

### Seeds

Very few cones per plant with viable seed, few buds seen (RMC91120502);

### Visitors

Honey bees collecting gum on outside of heads (AGR92080405); Yellow legged black spider wasp collecting goo on outer bracts (AGRY0072309);

Baboons seem to be damaging lots of branches and buds! (JCJ97032102); Baboon interference with flowerheads (LYM96060603); Baboons? had mutilated some flowerheads (LYM97051703+5, LYM99060305); Flowerheads damaged by baboons (NGF97051708); Baboons picking heads - numerous broken heads lying all over the place - broken open (WEL94080601);

Cones being eaten by rodents (OUT95071601); Bees boring into young buds (GCS99011903); Brown thick billed finch type bird pecking seedhead (SMR99080802); Sun setting - rain thickening - birds suddenly frantically feeding (AGR98040717);

### Fire recruitment and population collapse

A huge variation in size: 2m to 350mm tall! (AGR93022105);

Burned 3 years ago when veld 5 years old - too frequent for good recruit - few seedlings compared to expected: higher in unburned patches! (AGR91121206);

No young seen for 3 species! - may be too early - no rains - but contrast with previous plot - probably north aspect (vs south) killed them because of lack of rains since easter - speculation (AGR96060513);

With 1 year cones plus buds - i.e. 7 years to set seed! (AGR91122905);

Too frequently burned - all plants (1985/6) gone (AGR91100608); 28 dead skeletons to over 80 young plants dead skeletons had

flowered 2 or 1 or 5 times (mode 2 in 12 year old veld) seem to have aborted flowering in some years - too dry? (AGR91123007); Lots - hundreds - of skeletons and very few young (AGR95110806); Lots of skeletons: X5 more dead than recruited (AGR97030115); Very Bad recruitment : about 1% original population (AGR95112615); Spectacular recruitment failure in one burned patch good recruitment in another in this area (AGRY2053006); Only 1/3 of prefire population (AGRY2053007); poor regeneration noted (LYMY0030503); Very poor regeneration: despite there being many old skeletons very few seedlings found (NGFY0030505-8); Seedlings could not be found despite there being many parent plants (NGFY2050207); 1 young plant per 4-5 dead skeletons (SGAY0123005); Much fewer seedlings than dead adults; common before fire (SGAY1022102-4+7); Hundreds of dead and no young (STU97030120); Young plants which have not flowered before many killed by fire (TLE97082403); Apparent collapse of population after fire? (WMPY2103006-7 1 adult to 5 young (AGRY0042402); All adults killed by fire - plenty babies (VCH98120903);

X 10 the numbers in the previous generation! quite a contrast to the lower slopes where the ration was the other way around (about 2 adults per seedling) but the hotter dryer slopes could mean that the young are missed (AGRY1031105);

Good regeneration in some disturbed areas (AGR92012301); One dead plant with lots of young plants in 'shade' - interfire recruitment (AGRY0112615);

On more sandy area but not recruiting on shifting sands where skeleton most common (AGR92122804);

Failed to recruit at this altitude - lots of skeletons (ca 5-15 plants) (AGRY2041927);

Farmer Paul Roux - Vlotenberg - remembers fields of plants from 20 years ago showed me the last plant! (AGR96022801);

**Mortality**  
 All dead (AGR99120710, AGRY2081309, AGRY2112144, AGRY3111323, AGRY3112628); Only dead plants seen (AGRY0081237, AGRY1022111); Significant mortality (SHRY1021401); Lots dead (AGRY0082623, VCH99091707); Lots of dead - by heat? (AGRY0112301); Large number dead (DJL99072903-4); Many dead (SMR96110703); About 50% mortality of adults - due to drought? (NAHY0070501); 10% of plants dead (AGRY0112609); Only skeletons seen - very few (AGRY2071024, AGRY2080904);

Lots of die-back of stems and some dead (AGRY0093008); Lot of die-back (OUT98050906); Die-back (OUT98040409, OUT99061202-3); Die-back (drought?) (GEDY0112222); Some drought die-back (SMR99072904);

Dying (CFR99072902-3, OUTY1020402); Many plants dying (OUT97052409); Whole patch of about 1ha dying (OUTY0070111); Some dying - drought related (WIJY0112608, WIJY0122310);

Struggling to stay alive (DOA99102711); Very stressed (LYM98081012); Some stressed and dying (LYM99041301); Drought stress (WIJY0112609); Several plants partially or wholly dead presumably on account of drought (WIJY0112603); The lonely plant seems stressed (AWA97120401);

Lots dead : veld senescent bush cut (AGR96040202); More than 100 skeletons! (AGR98030101); Frequent skeletons - no young seen (AGRY0090703); High mortality - more dead than living plants in portions of the plot (AGRY1012101); 20% plants dead drought? (AGRY2102606); Lots dead and all senescent some interfire recruitment (AGRY3111815); Lots of dead senescent plants in patches of very old veld (>15 years) (AGRY4102705); Senescent veld with dead plants (RMC91120502); Old and sad (SMR98081903);

Lots dead! probably drought - little rain so far although proteas shorter than expected but seem to be at about the same density to prefire (AGR99072902);

Only a few dead - compared to *P. punctata* in neighbouring plots and *P. amplexicaulis* in this plot (AGRY6020805);

Lots of dieback and regrowth (AGRY0112206); Much new growth because most leaves have fallen off (drought?) (AGRY0112610); Plants are half dead but much new growth from buds in dropped leaf stems (AGRY0112616); Recovering - presumably drought dieback (GEDY0112107-8); About 6 weeks ago these plants looked dead - now have leaves and buds - drought? (LKA99103002); Lost most of their leaves - drought? (LKAY0102801); Most very stressed and looked like they were dying however many did have lots of new growth on the tips and some had flowers or buds - farmer reported very heavy rains in summer 1998? causing some disease and this winter has been the driest on record (WMPY0110401); Plants very stressed lots dead driest winter in recorded history very wet summer Dec 1998 (WMPY0110404);

Soil creep and many plants are leaning over and breaking (WIJ99080805);

**Browsing**  
 One plant very badly grazed by some animal (AGR91120709); Below 1.5m grazed distinct browse line (cattle?) - from distance looked like *Acacia cyclops* (AGR97121325) Heavily grazed (SMRY0021102);

Baboon damage (LYM97051707); Baboon damage - both old and more recent damage (MAJ92050901); Many flower stems half broken to bend down - probably baboons (SMR99060307); The baboons break down branches presumably for the nectar and so cause seeds to be dispersed because the dead dry inflorescences release their fruit when dry (VJK96050504);

Heavy chomping by *Otomys* at first looking like picking (AGR99100310); *Otomys* damage (NGFY6021601);

All plants suffering swelling on leaves no buds no new growth (AWA95031601);

Fungus growing on the tips of the nearly plants leaves perhaps as a result of the plants being



weakened after a dry winter (or at least very late winter rains) (NGF99101902);

**Escaped Plants**

All plants within 5-6m of the road - seeded from transported proteas ? (SMRY0052410); These are growing a long way from the Langeberg in the Renosterbos veld where wheat is grown sometimes with success one of nature's surprises ! (VJK96050501); These pr species are surviving at the edge of the invaders on the road verge only a miracle can save them from extinction (VJK97090401);

**Confusing Species:** A very small proportion of records mainly of preflowering young: after flowering the flowerheads and the "ice-cream cone" seedheads are unique. Most easily misidentified with *P. acuminata* (with which it overlaps completely in leaf size, but

typically *P. repens* is broader, especially where they co-occur) before flowering. Records of identification queries = 36. Records of corrected identification queries = 3.

**Variation and Taxonomy:** Growth form and leaves are uniform across the range. Involucral bracts vary from:

- In the western Cape: pure creamy-white – prominent in the Cape lowlands - to white tipped with pink or red.
- In the summer-rainfall region: deep red tones, with bracts crimson to scarlet and even deep-plum.

**Distribution:** Add.

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## *Protea foliosa* Rourke 1975 Leafy Sugarbush

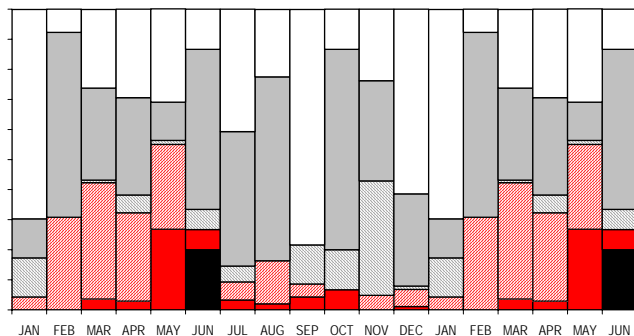
**Other Common Names:** None known.  
**Other Scientific Names:** *caulescens* EMey ex Meisn 1856, *magnolifolia* Buek 1856, *tenax* var *latifolia* Meisn 1856.

### 629 Records

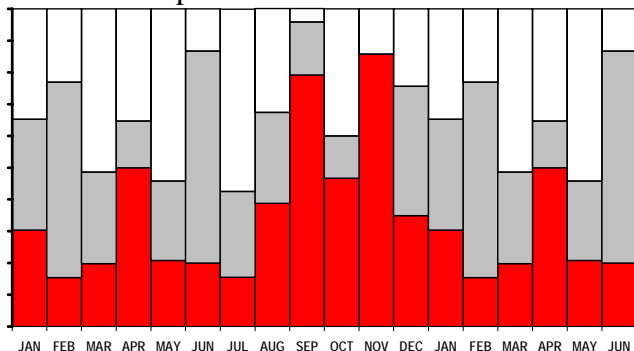
**Population** (624 records): 33% Common, 54% Frequent, 12% Rare.

**Dispersion** (590 records): 71% variable, 18% clumped, 11% widespread, 1% evenly distributed.

**Flowering** (613 records with: Jan 23, Feb 13, Mar 111, Apr 34, May 71, Jun 15, Jul 150, Aug 49, Sep 23, Oct 15, Nov 21, Dec 88): Buds from Feb to May; Flowering from May; Peak Flowering from Jun; Over from Nov; Fruit from Feb to Apr, Jun to Aug, and Oct to Dec; Nothing from Nov to Jan, Mar to May and Jul to Sep. Peak levels at 56% in May. Historically recorded as flowering from Mar to Sep, with a peak from May to Jun.



**Growth** (611 records with: Jan 23, Feb 13, Mar 111, Apr 34, May 72, Jun 15, Jul 148, Aug 49, Sep 24, Oct 15, Nov 21, Dec 86): Much from Aug to Jan and Mar to Jun; Rare from Dec to Mar and May to Aug; None from Dec to May, Jul to Aug and Oct. Peak levels at 96% in Sep.

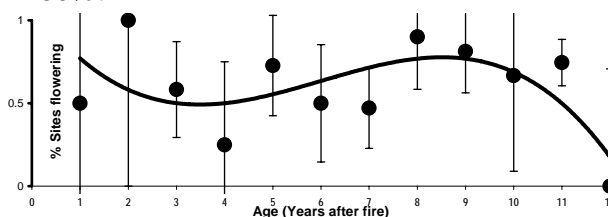


**Seedlings** (407 records): Absent in 98%; fewer seedlings than prefire adults in 4 cases. Seedlings found in Aug (2) and Oct (2).

**Fire Survival** (51 records): 78% resprouted from underground boles, 12% eliminated from the area by fires, 10% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100%

never attained, fluctuating between 50 and 80%.



**Height** (620 records): 17% 0-0.2 m tall, 81% 0.2-1 m tall, 2% 1-2 m tall.

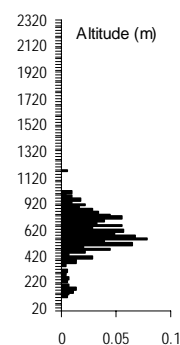
**Pollinators** (2 records): 100% mammals.

**Detailed Pollinators:** No additional data.

### Habitat:

**Distance to Ocean** (557 records): 100% inland - further than 2 km from coast.

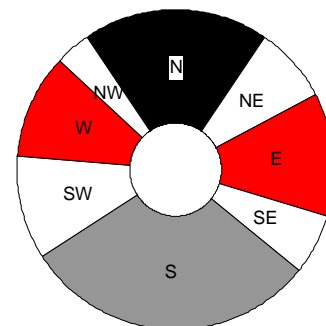
**Altitude** (557 records): 100 - 1080 m; 500 *lq* - 580 *med* - 660 *uq*m.



**Landform** (555 records): 79% deep soil, 19% shallow soil, 2% rocky outcrops.

**Slope** (555 records): 41% gentle incline, 34% steep incline, 23% hill top, 2% platform.

**Aspect** (472 records): 39% South, 25% North, 19% East, 18% West.



### Soil Type

(553 records): 67% loamy, 26% sandy, 3% clayey, 3% gravelly, 1% rocky.

**Soil Colour** (553 records): 55% grey, 42% brown, 2% black.

**Geology** (546 records): 96% sandstone, 2% shale.

**Vegetation** (556 records): 79% shrubland, 14% grassland, 6% plantations.

### Conservation Status and Threat:

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 2 662 km<sup>2</sup> with 43% conserved and 8% lost; Occupancy: 540 km<sup>2</sup> with 59% conserved and 13% lost. Fragmentation index: 6%.

**Nature Reserves** (557 records): 44% in nature reserves.

**Habitat destruction** (528 records): 82% extensive natural habitat, 16% islands.

**Alien Invasive Species** (531 records): 45% none, 35% *Pinus*, 12% Fabaceae (chiefly alien *Acacia*), 7% *Hakea*.

**Alien Density** (529 records): 45% alien-free, 38% sparse, 14% abundant, 4% dense.



**Cultivation & Utilization:****Picking** (514 records): 99% no sign of picking, 0.6% lightly picked.**Cultivation Status:** Plantings - 1 record (0.2%).**Witch's Broom Infestation:** 1 record (0.2%).**Atlasers Notes:****Size**

Very tall but definitely resprouting erect stems and broad leaves (AGRY0070419-21);

**Flowering**

First flowers after burnt in 1992 (DEL96032609); Healthy and flowering prolifically (JCM93073101); Many plants have "buds" that appear to be from more than one flowering season ago but never developed fully into an inflorescence - The buds then become lignified (PRG95071803);

**Variation**Strange form - looks more like *P. tenax* in leaves but habit wrong (DOA99112331); Forms in this NW area have significant narrower leaves than those nearer the coast (NAH95050901);**Mortality**

Plus 3 dead seen - no other plants with dead - Drought? (AGRY0070709); 4 out of 7 dead (AGRY0122818); Plants appear to have died off (DFJ95120301); Very healthy stand of vegetation with just one very sick protea (DFJ96031601); Plants were old (GJYY0051302); Only 1 specimen found at top of spur in 1986 there were at least 6 there; (NJH93082601)

**Population size**

5000 – 10000 (NJH93100301); Single specimen (RAL93010809);

Plants in poor condition trampled and browned a single flowering specimen 6-10 plants in

clumps at various locations at the site (RAL93011701);

**Pollination**

Fresh rodent droppings around plants (PRG95071701, PRG95071802);

**Browsing**

Grazing livestock tend to defoliate plants (JCM93012801);

**Distribution**More in damp areas! this is the only place where i have seen *P. tenax* and *foliosa* together (MCG97091408); Appeared abruptly as we started up a steeper incline at the edge of this locality (PNR97110901); This species obviously extends as far NW as the Groot Rivier whose gorge forms a major barrier - however the species should be looked for on Jentoesvlak to the W of the river - this locality is a range extension of Some 20km (NAH95050904);**Confusing Species:** Readily confused with *P. tenax* especially in the western populations. But has broader leaves (usually) and an erect habit. A single case of confusion with *P. cynaroides* – but that is totally distinct, even if only in leaf – with a long stalk to the leaf!

Records of identification queries = 42.

Records of corrected identification queries = 25.

**Variation and Taxonomy:** Although not noted by Rourke, two forms: a Fynbos form (on sandstones) with narrower leaves and a Suurberg form (on quartzites) with broader leaves.**Distribution:** Add.

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*Protea intonsa* Rourke 1971  
Tufted Sugarbush

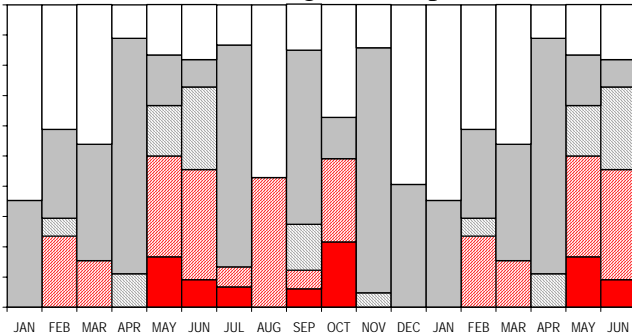
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**305 Records**

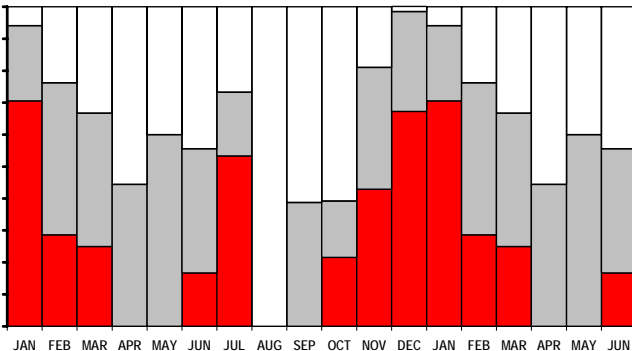
**Population** (302 records): 0.3% Abundant, 20% Common, 52% Frequent, 27% Rare, 0.7% Extinct.

**Dispersion** (263 records): 72% variable, 19% clumped, 7% widespread, 2% evenly distributed.

**Flowering** (264 records with: Jan 17, Feb 17, Mar 13, Apr 9, May 6, Jun 11, Jul 15, Aug 7, Sep 33, Oct 51, Nov 21, Dec 64): Buds from Feb, May to Jun, Aug and Oct; Flowering from Oct, but at low levels from May to Oct; Peak Flowering not recorded; Over from Jun; Fruit from Nov to Apr and Jul to Sep; Nothing from Dec to Mar Aug and Oct. Peak levels at 72% in Jun. Historically recorded as flowering from Sep to Nov.



**Growth** (276 records with: Jan 17, Feb 21, Mar 12, Apr 9, May 10, Jun 18, Jul 15, Aug 7, Sep 31, Oct 51, Nov 21, Dec 64): Much from Oct to Mar and Jul; Rare from Nov to Jul and Sep; None from Feb to Oct. Peak levels at 99% in Dec.



**Seedlings** (123 records): Absent in 95%; fewer seedlings than prefire adults in 3 cases. Seedlings found in Jun and Sep.

**Fire Survival** (36 records): 94% resprouted from underground boles, 6% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2 years, with 100% not recorded and fluctuating around 50%.



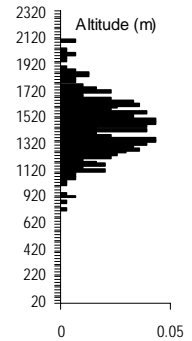
**Height** (277 records): 90% 0-0.2 m tall, 10% 0.2-1 m tall.

**Pollinators** (1 record): 100% beetles.  
**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (305 records): 100% inland - further than 2 km from coast.

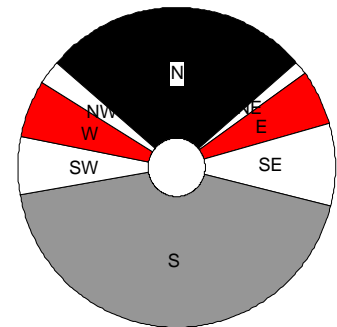
**Altitude** (305 records): 700 - 2000 m; 1180 *lq* - 1320 *med* - 1460 *uq*m.



**Landform** (305 records): 70% shallow soil, 24% deep soil, 6% rocky outcrops.

**Slope** (305 records): 44% steep incline, 39% gentle incline, 14% hill top, 2% cliff, 1% platform.

**Aspect** (268 records): 51% South, 29% North, 11% West, 9% East.



**Soil Type** (297 records): 44% loamy, 30% sandy, 20% rocky, 4% gravelly, 1% clayey, 1% peaty.

**Soil Colour** (297 records): 57% grey, 36% brown, 5% black, 1% orange.

**Geology** (304 records): 97% sandstone, 3% shale.

**Vegetation** (304 records): 98% shrubland, 2% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 2 461 km<sup>2</sup> with 42% conserved and 2% lost; Occupancy: 298 km<sup>2</sup> with 45% conserved and 3% lost. Fragmentation index: 7%.

**Nature Reserves** (305 records): 57% in nature reserves - well conserved.

**Habitat destruction** (300 records): 98% extensive natural habitat, 1% islands.

**Alien Invasive Species** (255 records): 95% none, 2% Fabaceae (chiefly alien *Acacia*), 1% *Hakea*, 1% *Pinus*, 1% annual alien grasses.

**Alien Density** (255 records): 95% alien-free, 4% sparse, 1% abundant.

**Cultivation & Utilization:**

**Picking** (186 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:****Seed predation**

No recent cones found - many mice (OUTY1012104);

**Variation**

Broader - more erect slightly hairier not clear cut - Hybrids? (AGR97022609); Broad leaf form! (AGR97092405);

Long plumes with white hairs on the florets (AGRY2102619);

With some *P vogtsiae* features - too narrow for *vogtsiae* but much broader than typical (SAS97092401);

**Mortality**

Some plants dying (OUT97052411); All dead (SAS97092401);

Mostly young plants (OUTY0042203);

**Distribution**

This is the only plot on Witberg that I found this species! (AGRY1071935);

Proteas all found below summit ridge on N aspect of peak (BMJ96081001); Prefer N slopes here (NAH95050703);

**Confusing Species:** Confused with *P. montana* (which forms mats) and *tenax* (which has broader leaves and trailing stems). In the Langkloof broad-leaf forms were found approaching *P. vogtsiae*, perhaps suggesting hybrid populations.

Records of identification queries = 16.

Records of corrected identification queries = 6.

**Variation and Taxonomy:** Broader leaf forms were recorded by atlassers in the Langkloof, where it tended to approach *P. vogtsiae*.

**Distribution:** Add.

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*Protea montana* Meyer ex Meisn. 1856  
Swartberg Sugarbush

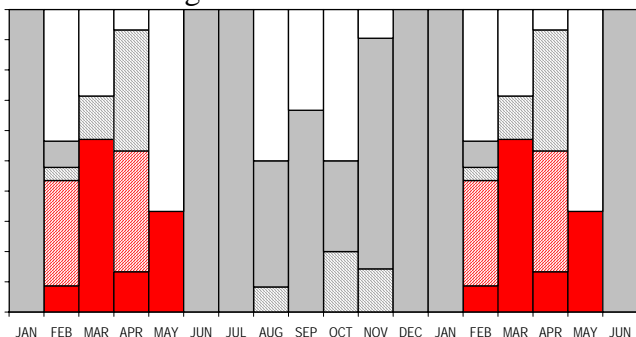
**Other Common Names:** None known.  
**Other Scientific Names:** *tugwelliae* Phill 1915.

**111 Records**

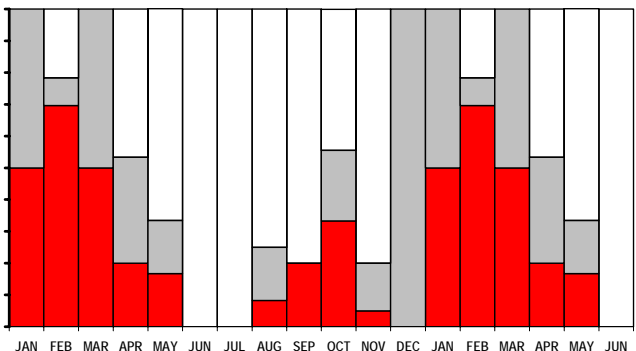
**Population** (111 records): 4% Common, 43% Frequent, 50% Rare, 3% Extinct.

**Dispersion** (79 records): 57% variable, 28% clumped, 9% widespread, 6% evenly distributed.

**Flowering** (107 records with: Jan 2, Feb 23, Mar 7, Apr 15, May 6, Jun 2, Jul 1, Aug 12, Sep 6, Oct 10, Nov 21, Dec 2): Buds from Feb and Apr; Flowering from Mar and May; Peak Flowering not recorded; Over from Apr and Oct; Fruit from Jun to Jan; Nothing from Feb to Mar, May and Aug to Oct. Peak levels at 93% in Apr. Historically recorded as flowering from Feb to Jun.



**Growth** (104 records with: Jan 2, Feb 23, Mar 6, Apr 15, May 6, Jun 2, Jul 1, Aug 12, Sep 5, Oct 9, Nov 20, Dec 3): Much from Jan to Apr and Sep to Oct; Rare from Dec to Jan, Mar to Apr and Oct 22; None from Feb and Apr to Nov. Peak levels unreliable at 78% in Feb.



**Seedlings** (43 records): All without any seedlings present.

**Fire Survival** (8 records): 38% escaped fires in fire-safe areas, 38% resprouted from underground boles, 25% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 5 years, and 100% recorded at 5 years.



**Height** (107 records): 92% 0-0.2 m tall, 8% 0.2-1 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

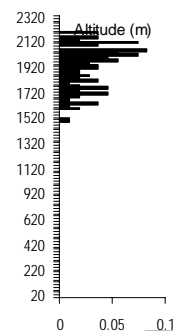
**Distance to Ocean** (108 records): 100% inland - further than 2 km from coast.

**Altitude** (108 records): 1380 - 2100 m; 1680 *lq* - 1880 *med* - 1940 *uq*m.

**Landform** (107 records): 58% shallow soil, 26% deep soil, 16% rocky outcrops.

**Slope** (108 records): 56% steep incline, 25% gentle incline, 16% hill top, 2% cliff.

**Aspect** (90 records): 52% South, 18% West, 17% North, 13% East.

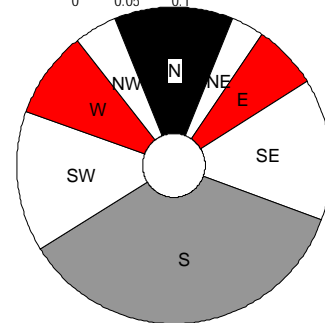


**Soil Type** (106 records): 39% sandy, 28% loamy, 17% rocky, 14% gravelly, 2% peaty.

**Soil Colour** (105 records): 46% grey, 30% brown, 21% black, 2% yellow, 1.0% white.

**Geology** (106 records): 98% sandstone, 2% shale.

**Vegetation** (107 records): 96% shrubland, 4% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable A4c, B1a(i)b(iv)+2a(i)b(iv).

Occurrence (Fynbos): 1 447 km<sup>2</sup> with 47% conserved and 1% lost; Occupancy: 112 km<sup>2</sup> with 80% conserved and 0% lost. Fragmentation index: 4%.

**Nature Reserves** (108 records): 96% in nature reserves - well conserved.

**Habitat destruction** (101 records): 94% extensive natural habitat, 3% islands, 3% naturally linear habitats.

**Alien Invasive Species** (89 records): 99% none, 1% *Pinus*.

**Alien Density** (89 records): 99% alien-free, 1% sparse.

**Cultivation & Utilization:**

**Picking** (75 records): 100% no sign of picking.  
**Cultivation Status:** No noted cultivation.

**Atlasers Notes:**

**Variation**

Very thick wide mats (OUT98030707);

Very fine leaves (OUTY0021206);

**Mortality**

The 8 plants were all dead no seedlings could be found the burnt part is 2 years (DOA97020905); Only dead bushes (ASP94100912); This one unburnt plant found was dead (NAHY2061701); Two dead plants seen which were in that part of the veld that did not burn in the last fire - no other plants were found (NGFY0081606); Very old plants: > 50 years? (NAHY5111801)

**Confusing Species:** Confused with *P. intonsa* and *tenax*, both with much wider leaves and neither of which form large mats.

Records of identification queries = 10.

Records of corrected identification queries = 7.

**Variation and Taxonomy:** Fairly variable.

Western forms have acicular leaves that are usually hairless, whereas eastern forms have broader linear spatulate leaves and are sparsely sericeous.

**Distribution:** Add.

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**Protea tenax** (Salisb.) R.Br. 1805, 1810  
**Tenacious Sugarbush**

**Other Common Names:** Foetid Erodendrum, Long-leaf Erodendrum, Small-mountain Sugarbush.

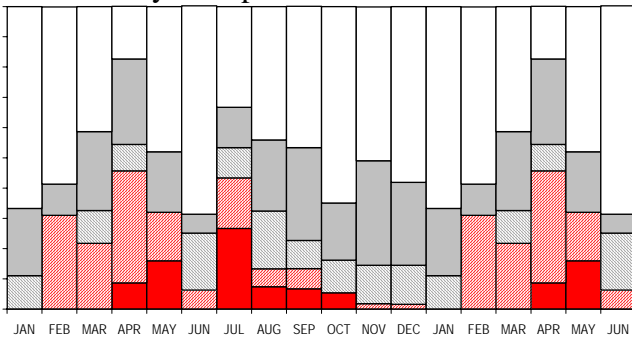
**Other Scientific Names:** *canaliculata* RBr 1810, *foetidum* (Salisb. ex Knight) 1809, *laevis* Sims 1907, *longifolia* Salisb 1805, *undulata* Phill 1910.

**522 Records**

**Population** (520 records): 12% Common, 56% Frequent, 32% Rare, 0.2% Extinct.

**Dispersion** (465 records): 62% variable, 23% clumped, 9% widespread, 6% evenly distributed.

**Flowering** (507 records with: Jan 18, Feb 29, Mar 46, Apr 46, May 25, Jun 16, Jul 30, Aug 68, Sep 75, Oct 37, Nov 55, Dec 62): Buds from Feb to Apr; Flowering from Jul; Peak Flowering not recorded; Over not significant; Fruit from Aug to Jan and Mar to May; Nothing from May to Mar. Peak levels at 53% in Jul. Historically recorded as flowering from all year round but mostly from May to Sep.



**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 6-7 years, and 100% never attained with fluctuations around 50-90%.



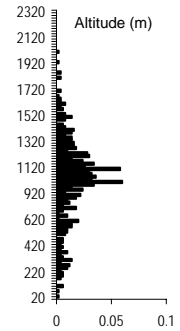
**Height** (519 records): 92% 0-0.2 m tall, 7% 0.2-1 m tall.

**Pollinators** (2 records): 100% beetles.  
**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (498 records): 100% inland - further than 2 km from coast.

**Altitude** (498 records): 20 - 1920 m; 760 *lq* - 960 *med* - 1080 *uq* m.

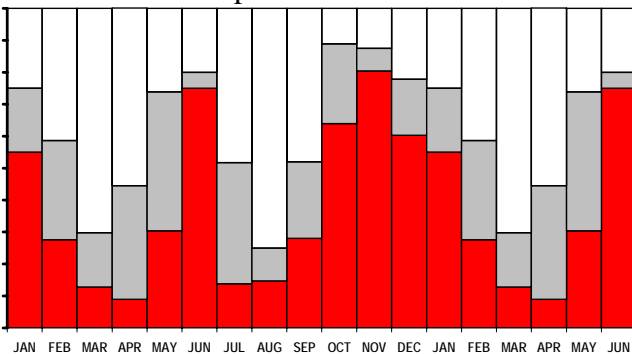


**Landform** (495 records): 58% deep soil, 36% shallow soil, 5% rocky outcrops.

**Slope** (496 records): 46% gentle incline, 42% steep incline, 8% hill top, 2% platform, 1% cliff.

**Aspect** (434 records): 41% South, 25% North, 18% West, 16% East.

**Growth** (511 records with: Jan 20, Feb 29, Mar 47, Apr 45, May 23, Jun 20, Jul 29, Aug 68, Sep 75, Oct 36, Nov 56, Dec 63): Much from Sep to Feb and May to Jun; Rare from Jan to Feb, Apr to May, Jul and Sep to Oct; None from Dec to Sep. Peak levels at 89% in Oct.

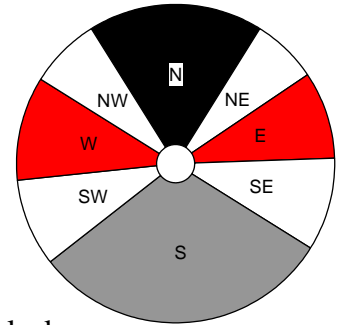


**Soil Type** (493 records): 42% loamy, 37% sandy, 10% rocky, 9% gravelly, 2% clayey, 1% peaty.

**Soil Colour** (494 records): 55% grey, 34% brown, 7% black, 2% yellow, 1% orange.

**Geology** (488 records): 96% sandstone, 4% shale.

**Vegetation** (495 records): 94% shrubland, 5% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.  
**Occurrence** (Fynbos): 10 315 km<sup>2</sup> with 34% conserved and 12% lost; **Occupancy:** 711 km<sup>2</sup> with 45% conserved and 7% lost.  
**Fragmentation index:** 5%.

**Nature Reserves** (498 records): 46% in nature reserves.

**Habitat destruction** (464 records): 97% extensive natural habitat, 1% naturally linear habitats.

**Seedlings** (267 records): Absent in 98%: fewer seedlings than prefire adults in 3 cases. Seedlings found in Jan, Jun and Nov.

**Fire Survival** (72 records): 86% resprouted from underground boles, 7% escaped fires in fire-safe areas, 4% survived by seedlings only, 3% resprouted from aerial trunks.

**Alien Invasive Species** (471 records):  
69% none, 17% *Hakea*, 7% *Pinus*,  
7% Fabaceae (chiefly alien *Acacia*).  
**Alien Density** (471 records): 69% alien-free,  
27% sparse, 3% abundant.

**Cultivation & Utilization:**

**Picking** (368 records): 100% no sign of  
picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 5 records (1.0%).

**Atlassers Notes:**

**Flowering**

Only 2 plants had flowers/ buds certainly in the  
minority (BMJ96071402); There was 1  
flowering (OUT93073105);

One plant carried 11 blooms (OUT93082101);  
Looked at many plants - only 5 flowers - found  
many plants without flowers or old seed  
heads strong yeasty smell from flower  
(BMJ96061702);

**Predation**

Buds bitten off (OUT97081703);

Seed scattered round plant- empty cones on  
large sprawling plants (MAJ92090501);

Heavily grazed - plant falls apart easily possible  
protection from grazer pulling whole branch  
up out of the grass (CBE93051803-4);

Grazed CBE93051804; Grazed and  
resprouting from base (WIJ97033002);

**Post fire**

Veld recovering from a hot fire but plants  
thriving and easily visible (DFJ97030104);

**Variation**

Narrower leaves (AGR97022609); Leaves 2-  
3mm wide and 130-140mm long  
(DOA92100105);

Leaves much larger than listed in Sasol guide -  
260mm x 10mm (MCG96110205);  
Many individual with some erect stems  
(APE94082304);

**Mortality**

In poor condition and could only find two  
(AWA98063001);

A lot are dying (OUT98040406); A lot are dead  
or dying (OUT98040407);

**Distribution**

Seems to prefer drier aspects! this is the only  
place where I have seen *P. tenax* and *foliosa*  
together (MCG97091408); Mostly on drier  
rockier sites (NAH95050905);

**Confusing Species:** Misidentified with *P.*

*foliosa*, *intonsa*, *montana* and *vogtsiae* – in  
fact all other species in the group. In several  
cases the plants are clearly intermediates and  
hybrid plants have been noted. It is distinct  
in having a rootstock from which trailing  
stems emerge, and flowerheads 40-60mm in  
diameter and shallowly bowl-shaped.

Records of identification queries = 34.

Records of corrected identification queries = 6.

**Variation and Taxonomy:** There is a wide  
spectrum of local races based on leaf width,  
which ranges from 2-28mm. In drier habitats  
leaves are narrow, linear and glaucous. In  
moister sites, leaves are broader, elliptic or  
oblongate and bright green in colour.  
Geographically these forms merge.

**Distribution:** Add.

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*Protea vogtsiae* Rourke 1974  
**Kouga Sugarbush**  
*Marieseroos*

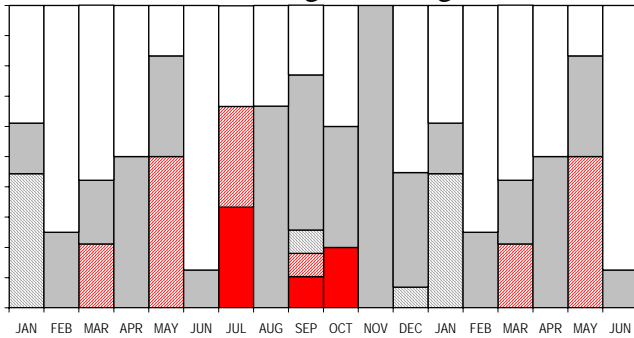
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**219 Records**

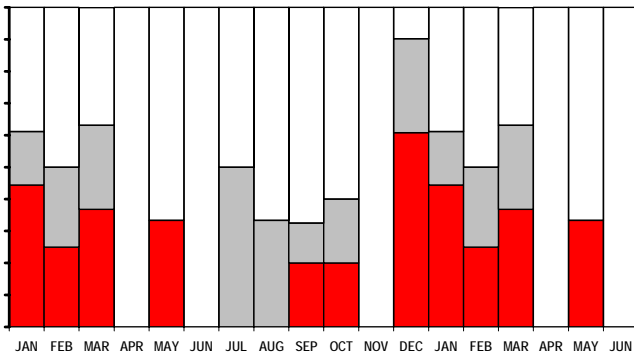
**Population** (215 records): 36% Common, 41% Frequent, 21% Rare.

**Dispersion** (194 records): 62% variable, 25% clumped, 11% widespread, 2% evenly distributed.

**Flowering** (215 records with: Jan 18, Feb 4, Mar 19, Apr 6, May 6, Jun 8, Jul 3, Aug 3, Sep 39, Oct 5, Nov 1, Dec 103): Buds from Mar, May and Jul; Flowering from Jul to Oct; Peak Flowering not recorded; Over from Jan; Fruit from Feb to May and Aug to Dec; Nothing from Jun to Apr. Peak levels unreliable at 26% in Sep. Historically recorded as flowering from Aug to Nov.



**Growth** (214 records with: Jan 18, Feb 4, Mar 19, Apr 6, May 6, Jun 8, Jul 2, Aug 3, Sep 40, Oct 5, Nov 1, Dec 102): Much from Sep to Mar and May; Rare from Feb to Mar, Jul to Aug, Oct and Dec; None from Jan to Nov. Peak levels unreliable at 90% in Dec.



**Seedlings** (88 records): All without any seedlings present.

**Fire Survival** (19 records): 84% resprouted from underground boles, 5% eliminated from the area by fires, 5% survived by seedlings only, 5% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 7-8 years, and 100% recorded consistently after 16 years.



**Height** (214 records): 93% 0-0.2 m tall, 7% 0.2-1 m tall.

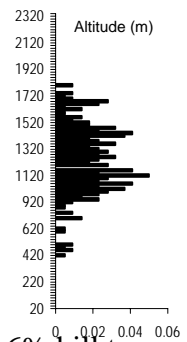
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (217 records): 100% inland - further than 2 km from coast.

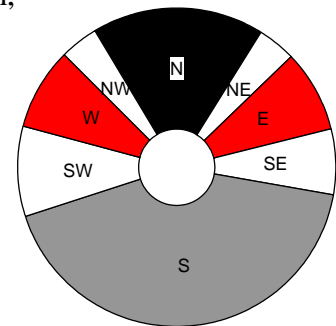
**Altitude** (217 records): 400 - 1700 m; 940<sub>lq</sub> - 1120<sub>med</sub> - 1300<sub>uq</sub>m.



**Landform** (216 records): 50% deep soil, 49% shallow soil, 1% rocky outcrops.

**Slope** (215 records): 45% steep incline, 34% gentle incline, 16% hill top, 2% valley bottom, 1% cliff, 1% platform.

**Aspect** (177 records): 51% South, 22% North, 14% West, 13% East.



**Soil Type** (214 records): 46% loamy, 33% sandy, 9% rocky, 6% peaty, 3% clayey, 3% gravelly.

**Soil Colour** (213 records): 51% grey, 38% brown, 9% black, 1% red.

**Geology** (212 records): 96% sandstone, 4% shale.

**Vegetation** (216 records): 98% shrubland, 1% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 2 120 km<sup>2</sup> with 41% conserved and 5% lost; **Occupancy:** 237 km<sup>2</sup> with 42% conserved and 3% lost. **Fragmentation index:** 11%.

**Nature Reserves** (217 records): 34% in nature reserves.

**Habitat destruction** (201 records): 90% extensive natural habitat, 4% islands, 3% naturally fragmented habitats, 2% naturally linear habitats.

**Alien Invasive Species** (202 records): 60% none, 23% *Pinus*, 12% *Hakea*, 3% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (202 records): 60% alien-free, 28% sparse, 11% abundant.

**Cultivation & Utilization:**

**Picking** (111 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

**Flowering**

Of the many, many plants we looked at we only saw one flower & one bud on the same plant! (BMJ96092301);

**Variation**

Narrow leaf form - almost like *P. intonsa* but broader (AGRY0121504-9); Leaves about 11mm wide (PINY0121502-7); With very narrow leaves (SGAY0121501);

Nice broad leaves (AGRY0121509);

Both *P. vogtsia* and *tenax* present (OUT96050104);

**Mortality**

Half plants dead (AGRY0121508); Of plants seen half dead and half of living half dead (AGRY0121509); More than half plants dead (AGRY0121510); Would be common if not for about half plants dead (AGRY0121520); 1/6th of plants dead

(AMMY0121515); Many dead (WIJY1010403);

**Distribution**

Extremely abundant (BMJ96092301); Occurs on most of the ridges in the area (HRK96081003); 6 patches - scattered along the rocky ridge on the very top of the peak (MCIY1072801); Restricted to uppermost part (SGAY0121501);

**Confusing Species:** Mistaken for *P. tenax* which has much narrower leaves that are not clumped on the ground. In the west of its range it appears to produce intermediates with *P. intonsa*.

Records of identification queries = 26.

Records of corrected identification queries = 4.

**Variation and Taxonomy:** Involucral bracts vary in colour within populations, from greenish-yellow suffused with dull carmine to uniformly dull carmine to claret in colour.

**Distribution:** Add.

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*Protea aurea subsp. aurea* (Burm.f) Rourke 1768, 1979

**Common Shuttlecock Protea**

*Geelsuikerkan*

**Other Common Names:** Christmas-candle Protea, Common Oval-leaf Sugarbush, Long-bud Sugarbush, Shuttlecock, Shuttlecock Protea, Waterlily Sugarbush, *Kerssuikerbos*, *Langknopsuikerbos*, *Langsuikerkan*, *Witkiersieprotea*.

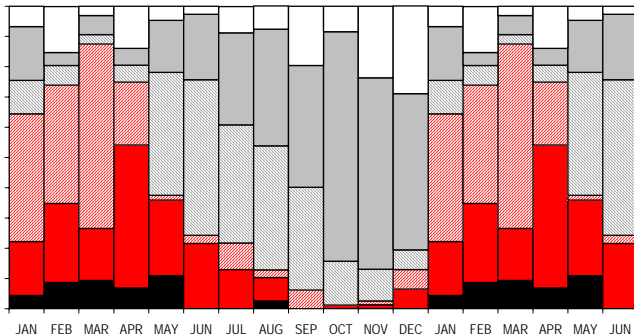
**Other Scientific Names:** *aemulum* Salisb. ex Knight 1809, *calycina* Schnee 1795, *longiflora* Lam 1792, *ovata* Thunb 1818, *radiata* Andr 1812, *radiata* Bonpl 1816.

**683 Records**

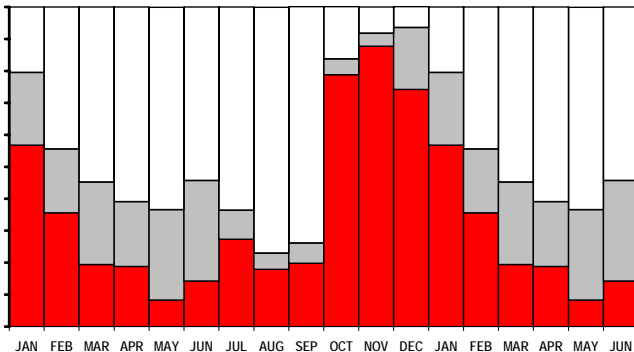
**Population** (609 records): 6% Abundant, 39% Common, 42% Frequent, 13% Rare.

**Dispersion** (574 records): 46% variable, 38% clumped, 11% widespread, 4% evenly distributed.

**Flowering** (677 records with: Jan 45, Feb 46, Mar 64, Apr 72, May 64, Jun 37, Jul 23, Aug 39, Sep 97, Oct 83, Nov 76, Dec 31): Buds from Jan to Apr; Flowering from Feb and Apr to Jun; Peak Flowering not significant from Jan to May; Over from May to Sep; Fruit from Jun to Dec; Nothing from Sep and Nov to Dec. Peak levels at 91% in Mar. Historically recorded as flowering sporadically throughout the year, but mainly from Jan to Jun.



**Growth** (651 records with: Jan 44, Feb 45, Mar 62, Apr 64, May 60, Jun 35, Jul 22, Aug 39, Sep 96, Oct 80, Nov 73, Dec 31): Much from Sep to Feb and Jul; Rare from Jan to Jun; None from Jan to Sep. Peak levels at 94% in Dec.



**Seedlings** (252 records): Absent in 83%; fewer seedlings than prefire adults in 5 cases, and more in 17 cases. Seedlings found in Feb (3),

Mar, Apr, May, Jun, Sep (6), Oct and Dec (8).

**Fire Survival** (46 records): 76% survived by seedlings only, 13% eliminated from the area by fires, 11% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 5-6 years, and 100% recorded at 8 years, with evidence of decline after 21 years.



**Height** (679 records): 3% 0-0.2 m tall, 22% 0.2-1 m tall, 47% 1-2 m tall, 26% 2-5 m tall, 2% taller than 5 m.

**Pollinators** (33 records): 76% birds, 12% beetles, 6% bees or wasps, 3% flies, 3% none observed.

**Detailed Pollinators** (27 records): Cape Sugarbird (18), Orange-breasted Sunbird (8), Great Protea Beetle.

**Habitat:**

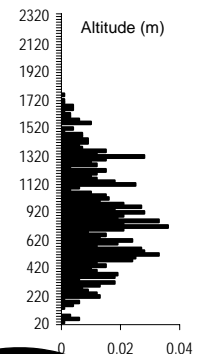
**Distance to Ocean** (604 records): 100% inland - further than 2 km from coast.

**Altitude** (604 records): 200 - 1660 m; 540 *lq* - 760 *med* - 1000 *uq*m.

**Landform** (603 records): 78% deep soil, 17% shallow soil, 3% rocky outcrops, 2% riverine.

**Slope** (603 records): 57% steep incline, 35% gentle incline, 4% hill top, 2% valley bottom.

**Aspect** (560 records): 55% South, 17% North, 15% East, 13% West.

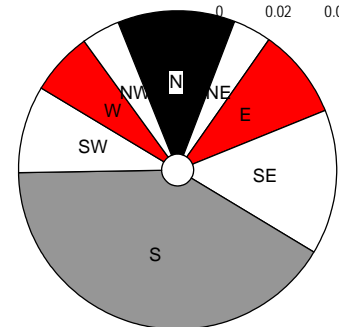


**Soil Type** (601 records): 46% loamy, 35% sandy, 6% peaty, 6% clayey, 4% gravelly, 3% rocky.

**Soil Colour** (596 records): 42% brown, 36% grey, 18% black, 2% orange, 1% yellow.

**Geology** (590 records): 84% sandstone, 15% shale, 1% granite.

**Vegetation** (599 records): 97% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 4 324 km<sup>2</sup> with 25% conserved and 16% lost; Occupancy: 558 km<sup>2</sup> with 53% conserved and 8% lost. Fragmentation index: 8%.

**Nature Reserves** (604 records): 71% in nature reserves - well conserved.

**Habitat destruction** (587 records): 94% extensive natural habitat, 3% naturally linear habitats, 2% islands.

**Alien Invasive Species** (578 records): 57% none, 21% *Pinus*, 16% *Hakea*, 5% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (576 records): 58% alien-free, 38% sparse, 3% abundant, 2% dense.

**Cultivation & Utilization:**

**Picking** (437 records): 99% no sign of picking, 0.7% lightly picked, 0.5% severely picked.

**Cultivation Status:** Plantings - 58 records (8%), Augmentations - 1 record (0.1%), Escapes - 14 records (2%).

**Atlassers Notes:**

**Color forms**

Cream coloured flowers (WEL94030507); Cream coloured or pink-red coloured flowers (WEL94030508); Pinkish-red flowerheads (WEL94030602); Some flowers red others yellow (WIJ92050106);

**Invasive**

Although originally planted appears to becoming naturalized - seems to be happy (PVR93053104-5);

Also had wasps and flies in the flowers (DOA93022703); Ants (SHS93032301);

Brown beetle with green head - elongated shape (WIJ92050106);

**Distribution**

On shale lens (AGRY3103131+33); Below shale lens on runoff zone (AGRY3103132); Growing on an isolated shale band (WEL95030405);

In riverbed (AWA98103108); Only grows near river (KLW94111803); Growing along river bank (OUT94072303); In valley (WIJ98051705); Growing at edge of thicket along stream - (WMP95123003);

Clustered "in the middle of nowhere" (AWA99021802);

On south- facing slopes (PMR98040502);

**Confusing Species:** Only mistaken when not in flower, especially when planted or escaped beyond its natural distribution, usually with other white water proteas (*laticolor* 17%, *mundii* 22% and *punctata* 61%), although regularly atlassers did not identify the subspecies.

Records of identification queries = 34.

Records of corrected identification queries = 22.

**Variation and Taxonomy:** Usually involucre bracts are whitish-green, but most populations have a proportion of plants with pink bracts, but clear-crimson forms do occur.

**Distribution:** Add.

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*Protea aurea subsp. potbergensis* (Rourke) Rourke 1978, 1979  
**Potberg Sugarbush**

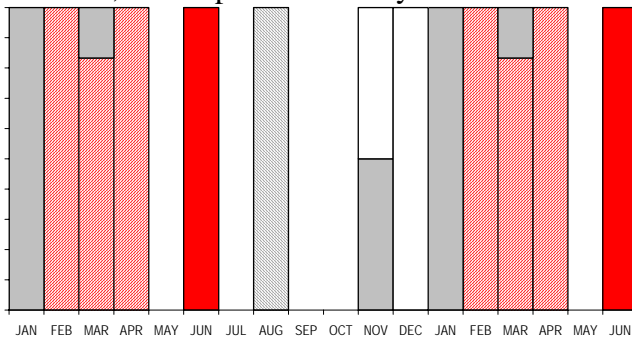
**Other Common Names:** Potberg Shuttlecock.  
**Other Scientific Names:** *None*.

**32 Records**

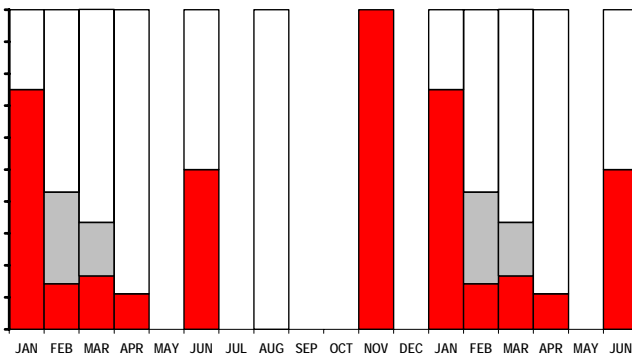
**Population** (31 records): 3% Abundant, 61% Common, 29% Frequent, 6% Rare.

**Dispersion** (29 records): 52% clumped, 38% variable, 7% evenly distributed, 3% widespread.

**Flowering** (32 records with: Jan 4, Feb 7, Mar 6, Apr 9, May 0, Jun 2, Jul 0, Aug 1, Sep 0, Oct 0, Nov 2, Dec 1): Buds from Feb to Apr; Flowering from Jun; Peak Flowering not recorded; Over from Aug; Fruit from Nov to Jan; Nothing from Nov to Dec. Peak levels unreliable at 100% in Jun. Historically recorded as flowering from Apr to Jul, with a peak from May to Jun.



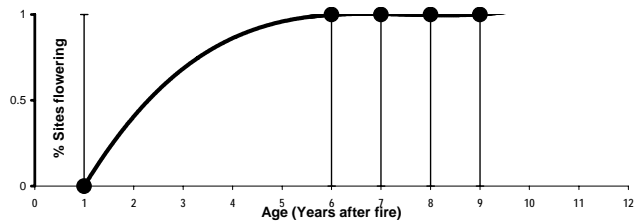
**Growth** (31 records with: Jan 4, Feb 7, Mar 6, Apr 9, May 0, Jun 2, Jul 0, Aug 1, Sep 0, Oct 0, Nov 2, Dec 0): Much from Nov to Jan and Jun; Rare from Feb; None from Jan to Aug. Peak levels unreliable at 100% in Nov.



**Seedlings** (21 records): Absent in 81%; more seedlings than prefire adults in 2 cases. Seedlings found in Jun and Nov.

**Fire Survival** (1 record): 100% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 6 at 100%.



**Height** (32 records): 3% 0-0.2 m tall, 28% 0.2-1 m tall, 59% 1-2 m tall, 9% 2-5 m tall.

**Pollinators** (4 records): 75% birds, 25% beetles.

**Detailed Pollinators** (4 records): Cape Sugarbird (2), Orange-breasted Sunbird, Great Protea Beetle.

**Habitat:**

**Distance to Ocean** (32 records): 100% inland - further than 2 km from coast.

**Altitude** (32 records): 280 - 580 m; 380 *lq* - 400 *med* - 420 *uq*m.

**Landform** (32 records): 88% deep soil, 13% shallow soil.

**Slope** (32 records): 50% steep incline, 25% gentle incline, 16% hill top, 6% platform, 3% valley bottom.

**Aspect** (27 records): 72% South, 15% West, 11% East, 2% North.

**Soil Type** (30 records): 57% sandy, 23% loamy, 10% peaty, 7% clayey, 3% rocky.

**Soil Colour** (31 records): 77% grey, 23% black.

**Geology** (32 records): 81% sandstone, 19% shale.

**Vegetation** (32 records): 100% shrubland.

**Conservation Status and Threat:**

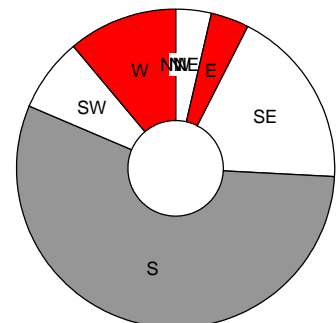
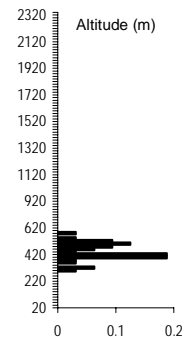
**Red Data List Status:** Near Threatened D2(i,ii).

**Occurrence** (Fynbos): 33 km<sup>2</sup> with 89% conserved and 0% lost; **Occupancy:** 31 km<sup>2</sup> with 95% conserved and 4% lost. **Fragmentation index:** 86%.

**Nature Reserves** (32 records): 100% in nature reserves - well conserved.

**Habitat destruction** (31 records): 87% extensive natural habitat, 10% naturally linear habitats, 3% islands.

**Alien Invasive Species** (32 records): 59% none, 28% *Pinus*, 9% Fabaceae (chiefly alien *Acacia*), 3% *Hakea*.



**Alien Density** (32 records): 59% alien-free, 38% sparse, 3% abundant.

**Cultivation & Utilization:**

**Picking** (26 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

Several pink flowered plants observed - significant as "Proteas of southern Africa" says always yellow (SHR96062203);

Dense stand in band associated with shale band (RMC92112801); Clumped on steep south-facing side of Grootkloof (SHR96062203);

**Confusing Species:** One instance of young plants misidentified as *P. lanceolata*.

Records of identification queries = 4.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** Like all the White-water proteas, a proportion of pink flowerheads occurs in most populations.

**Distribution:** Add.

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*Protea laticolor* Salisb. 1805

**Hottentot Sugarbush**

*Witsuikerbos*

**Other Common Names:** Baby Sugarbush, Baby-pink Protea, Hottentot-white Sugarbush, Hottentots Holland Sugarbush, Mini-rosette, Silk-fringed Erodendrum, Sugarbush, *Hotnotwitsuikerbos*, *Hottentotwitsuikerbos*, *Kleinpinksuikerbos*, *Ivy*.

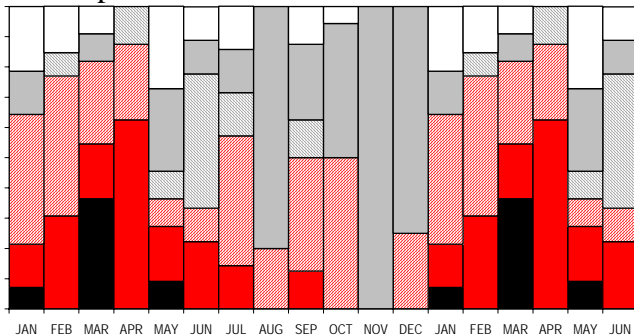
**Other Scientific Names:** *bombycinum* Salisb. ex Knight 1809, *ochroleuca* Smith <date>, *penicillata* EMey ex Meisn 1856.

**117 Records**

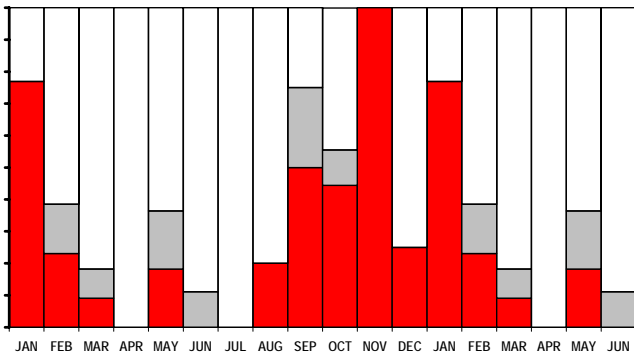
**Population** (81 records): 5% Abundant, 40% Common, 38% Frequent, 14% Rare, 4% Extinct.

**Dispersion** (71 records): 49% clumped, 46% variable, 4% widespread.

**Flowering** (111 records with: Jan 14, Feb 13, Mar 11, Apr 8, May 11, Jun 9, Jul 7, Aug 5, Sep 8, Oct 18, Nov 3, Dec 4): Buds from Dec to Apr and Jul to Oct; Flowering from Feb, Apr to Jun; Peak Flowering from Mar; Over from Jun; Fruit from May and Aug to Dec; Nothing from Jan and May. Peak levels at 100% in Apr. Historically recorded as flowering from Feb to Jun, peaking in Mar to Apr.



**Growth** (110 records with: Jan 13, Feb 13, Mar 11, Apr 8, May 11, Jun 9, Jul 7, Aug 5, Sep 8, Oct 18, Nov 3, Dec 4): Much from Aug to Feb; Rare from Sep; None from Dec to Oct. Peak levels unreliable at 100% in Nov.



**Seedlings** (45 records): Absent in 96%: more seedlings than prefire adults in 1 case. Seedlings found in Jan.

**Fire Survival** (5 records): 80% survived by seedlings only, 20% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 2 years in planted areas, but not by 3 years in the wild, 50% estimated at 6 years, and 100% recorded consistently at 7 years.



**Height** (114 records): 2% 0-0.2 m tall, 25% 0.2-1 m tall, 50% 1-2 m tall, 23% 2-5 m tall, 1% taller than 5 m.

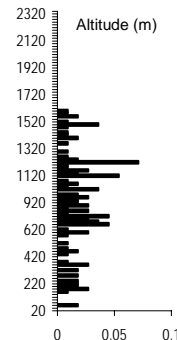
**Pollinators** (5 records): 60% birds, 40% bees or wasps.

**Detailed Pollinators** (3 records): Cape Sugarbird (2), Southern Double-collared Sunbird.

**Habitat:**

**Distance to Ocean** (77 records): 100% inland - further than 2 km from coast.

**Altitude** (77 records): 580 - 1500 m; 780<sub>lq</sub> - 980<sub>med</sub> - 1120<sub>uq</sub>m.



**Landform** (76 records): 76% deep soil, 14% shallow soil, 5% riverine, 4% rocky outcrops.

**Slope** (76 records): 55% steep incline, 36% gentle incline, 5% hill top, 3% platform, 1% valley bottom.

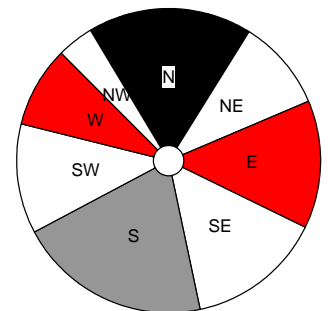
**Aspect** (70 records): 36% South, 26% North, 20% East, 18% West.

**Soil Type** (75 records): 37% sandy, 33% loamy, 13% gravelly, 8% peaty, 5% clayey, 3% rocky.

**Soil Colour** (75 records): 49% brown, 40% grey, 8% black, 1% white, 1% orange.

**Geology** (70 records): 66% sandstone, 31% shale, 3% granite.

**Vegetation** (75 records): 100% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable A4c.

Occurrence (Fynbos): 1 607 km<sup>2</sup> with 54% conserved and 20% lost; Occupancy: 80 km<sup>2</sup> with 85% conserved and 3% lost. Fragmentation index: 4%.

**Nature Reserves** (77 records): 97% in nature reserves - well conserved.



**Habitat destruction** (75 records):  
97% extensive natural habitat, 3% naturally linear habitats.

**Alien Invasive Species** (76 records):  
54% *Pinus*, 39% none, 5% *Hakea*,  
1% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (76 records): 39% alien-free,  
51% sparse, 5% abundant, 1% dense,  
3% impenetrable.

**Cultivation & Utilization:**

**Picking** (76 records): 97% no sign of picking,  
3% lightly picked.

**Cultivation Status:** Plantings - 33 records  
(28%), Escapes - 3 records (3%).

**Atlassers Notes:**

Clump killed by 1988/89 fire have not  
regenerated (GEH93073102);  
There were 2 clumps - one was flowering the  
other not (SHL95071601);

Plus Orange Breasted Sunbirds and various  
beetles (NAH94031902);

*Protea lacticolor* on slope and *mundii* confined  
to gully with perennial water (JID95030602);

Growing on slope above valley (WIJ98030804);  
At a stream (WIJY0090906);

**Confusing Species:** Confused with *P. mundii*  
mainly in the south and *punctata* mainly in  
the north. It differs from both these by its  
leaf bases which are truncate or cordate, and  
in flower by its being intermediate between  
the two (with minute knobs on the pollen  
presenter – *versus* no knob in *punctata* and  
large knob in *mundii*, and bracts opening  
slightly in the flowerheads – *versus* staying  
closed in *mundii* and opening completely in  
*punctata*). However, when not in flower the  
leaf bases of some populations are  
sufficiently borderline to pose identification  
problems.

Records of identification queries = 17.

Records of corrected identification queries = 8.

**Variation and Taxonomy:** Creamy-white  
flowerheads usually predominate, but all  
populations have pink flowerheads.

**Distribution:** Add.

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# *Protea mundii* Klotzsch 1838

## Forest Sugarbush

### *Woudwitsuikerbos*

**Other Common Names:** Mund's Sugarbush, Pin-head Protea, White Sugarbush, *Weisser Zuckerbusch*, *Speldekopsuikerbos*, *Suikerbos*, *Witsuikerbos*.

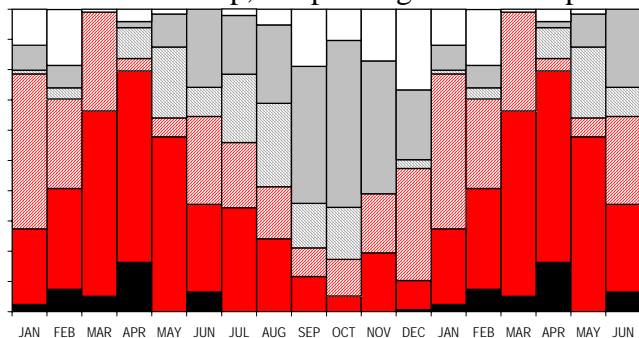
**Other Scientific Names:** *None*.

#### 849 Records

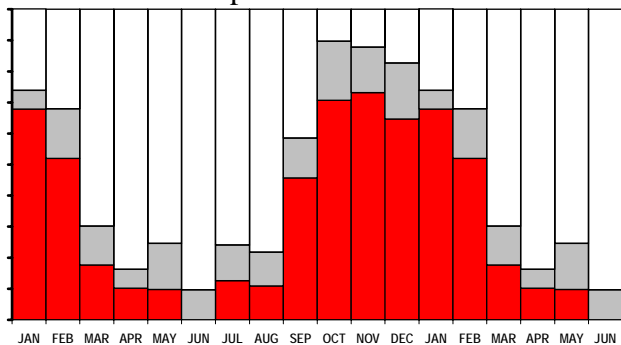
**Population** (803 records): 3% Abundant, 36% Common, 50% Frequent, 11% Rare.

**Dispersion** (757 records): 52% variable, 36% clumped, 8% widespread, 4% evenly distributed.

**Flowering** (833 records with: Jan 84, Feb 27, Mar 98, Apr 49, May 64, Jun 31, Jul 93, Aug 58, Sep 95, Oct 58, Nov 41, Dec 135): Buds from Nov to Mar and Jun to Jul; Flowering from Jan to Aug and Nov; Peak Flowering not significant peaking in Apr; Over from May and Jul to Aug; Fruit from Jun to Dec; Nothing from Dec. Peak levels at 99% in Mar. Historically recorded as flowering from Jan to Sep, but peaking in Feb to Apr.



**Growth** (814 records with: Jan 84, Feb 25, Mar 96, Apr 49, May 61, Jun 31, Jul 87, Aug 55, Sep 94, Oct 58, Nov 41, Dec 133): Much from Sep to Feb; Rare not significant; None from Jan to Sep. Peak levels at 90% in Oct.



**Seedlings** (387 records): Absent in 90%; fewer seedlings than prefire adults in 11 cases, and more in 9 cases. Seedlings found in Jan (3), Mar (2), Apr, Jul (11), Nov and Dec (2).

**Fire Survival** (52 records): 60% survived by seedlings only, 23% escaped fires in fire-safe areas, 13% eliminated from the area by fires, 4% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 5-6 years, and 100% recorded at 7 years.



**Height** (831 records): 2% 0-0.2 m tall, 11% 0.2-1 m tall, 44% 1-2 m tall, 38% 2-5 m tall, 5% taller than 5 m.

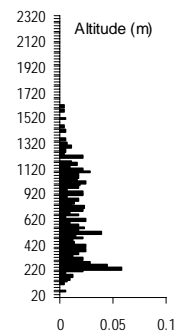
**Pollinators** (35 records): 80% birds, 11% bees or wasps, 3% butterflies or moths, 3% flies, 3% mites.

**Detailed Pollinators** (29 records): Cape Sugarbird (19), Orange-breasted Sunbird (5), Honey Bee (3), Malachite Sunbird, Amethyst Sunbird.

#### Habitat:

**Distance to Ocean** (787 records): 94% inland - further than 2 km from coast.

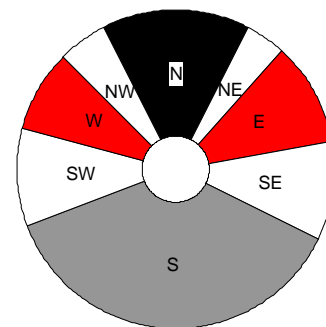
**Altitude** (787 records): 20 - 1720 m; 360<sub>lq</sub> - 600<sub>med</sub> - 900<sub>uq</sub>m.



**Landform** (775 records): 79% deep soil, 16% shallow soil, 4% rocky outcrops.

**Slope** (778 records): 41% steep incline, 39% gentle incline, 10% platform, 7% hill top, 2% cliff.

**Aspect** (665 records): 47% South, 20% North, 17% East, 16% West.



**Soil Type** (741 records): 59% loamy, 26% sandy, 5% peaty, 4% gravelly, 4% clayey, 3% rocky.

**Soil Colour** (738 records): 46% grey, 36% brown, 15% black, 2% orange.

**Geology** (740 records): 92% sandstone, 7% shale.

**Vegetation** (777 records): 92% shrubland, 3% plantations, 3% thicket, 1% grassland.

#### Conservation Status and Threat:

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 12 185 km<sup>2</sup> with 27% conserved and 22% lost; Occupancy:

926 km<sup>2</sup> with 48% conserved and 13% lost.  
Fragmentation index: 4%.

**Nature Reserves** (787 records): 43% in nature reserves.

**Habitat destruction** (755 records):  
86% extensive natural habitat, 8% islands,  
3% road verges, 2% naturally linear habitats.

**Alien Invasive Species** (744 records):

41% *Pinus*, 26% none, 20% *Hakea*,  
12% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (744 records): 26% alien-free,  
53% sparse, 15% abundant, 6% dense.

**Cultivation & Utilization:**

**Picking** (520 records): 99% no sign of picking,  
0.8% lightly picked, 0.2% severely picked.

**Cultivation Status:** Plantings - 28 records  
(3%), Escapes - 6 records (0.7%).

**Witch's Broom Infestation:** 2 records (0.2%).

**Atlassers Notes:**

About 10m high (DOA93050403); 15-20m  
(DOA96101445);

One plant had bright pink flowerheads  
(KCK92122201);

Unlike other species is 1/10 prefire density  
(AGRY1070804); Only skeletons seen  
(AGRY2011803); Dense patches of dead  
adult plants (height about 2m) but poor  
regeneration (SGAY0121306);

Kind of aphid which makes leaves curl up  
(CVV97061501);

Black butterfly visiting flowers (DFJ97040103);  
Medium sized black ants in opened  
flowerhead (IAN94021701);

On fringe of forest reinforcing its pioneer status  
(OUT93072502); On the forest margins  
(WAM92122901);

**Confusing Species:** Confused with *P.aurea* in  
the Garden Route, *P. punctata* in the  
Baviaanskloof and *P. laticolor* in the  
Kogelberg, but differs from all of these in  
that the flowerheads do not open much and  
the pollen presenters have large terminal  
knobs. When not in flower, the narrow leaf  
bases separate it from *P. laticolor* and  
*aurea*. The seedheads of *P. punctata* have  
outwardly splayed styles and bracts. It was  
also confused with *P. rupicola* pre-  
flowering, but that has much tougher  
spathulate leaves.

Records of identification queries = 42.

Records of corrected identification queries = 26.

**Variation and Taxonomy:** The predominant  
colour is creamy-white with a green flush,  
but pink forms occur in most populations.  
Although the western form appears to have  
larger heads and leaves, no documentation of  
the differences between the eastern and  
western forms has been published.

**Distribution:** Add.

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*Protea punctata* Meisn. 1856

**Water Sugarbush**

*Waterwitsuikerbos*

**Other Common Names:** Carnation Protea, Cup-and-saucer Sugarbush, Icing-sugar Protea, Water-white Sugarbush, *Angeliersuikerbos*, *Witsuikerbos*.

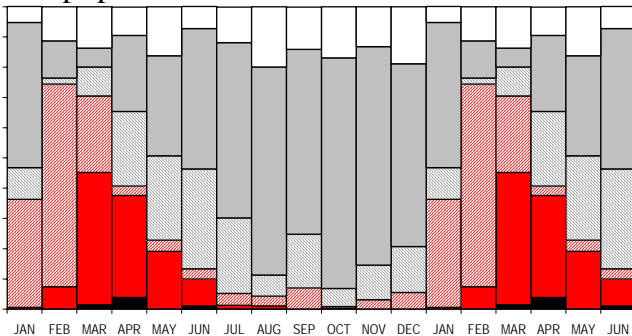
**Other Scientific Names:** *carlescens* EMey ex Meisn 1856, *coriacea* Buek ex Meisn 1856.

**2347 Records**

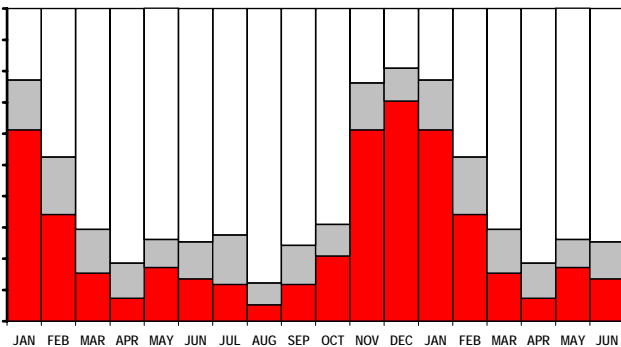
**Population** (2302 records): 2% Abundant, 27% Common, 53% Frequent, 17% Rare.

**Dispersion** (2099 records): 61% variable, 26% clumped, 10% widespread, 3% evenly distributed.

**Flowering** (2254 records with: Jan 171, Feb 203, Mar 146, Apr 255, May 136, Jun 179, Jul 76, Aug 186, Sep 157, Oct 354, Nov 227, Dec 164): Buds from Jan to Mar; Flowering from Mar to Apr; Peak Flowering not significant; Over from Apr to Jul; Fruit from Apr to Jan; Nothing from Aug. Peak levels at 80% in Mar. Historically recorded as flowering from Dec to Jun, with a Mar to Apr peak.



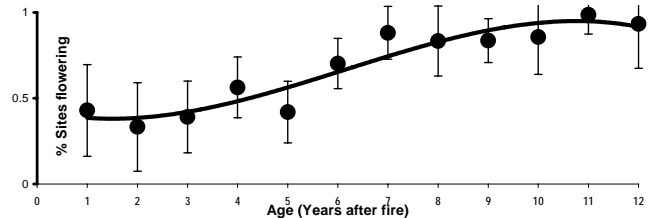
**Growth** (2225 records with: Jan 170, Feb 202, Mar 143, Apr 258, May 134, Jun 169, Jul 76, Aug 187, Sep 152, Oct 345, Nov 227, Dec 162): Much from Oct to Feb; Rare not significant; None from Jan to Nov. Peak levels at 81% in Dec.



**Seedlings** (886 records): Absent in 83%: fewer seedlings than prefire adults in 40 cases, and more in 34 cases. Seedlings found in Jan (7), Mar (4), Apr (6), May (6), Jun (9), Jul (6), Aug (5), Sep (3), Oct (11), Nov (3) and Dec (14).

**Fire Survival** (164 records): 52% survived by seedlings only, 26% escaped fires in fire-safe areas, 22% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2-4 years, and 100% recorded at 16 years.



**Height** (2285 records): 6% 0-0.2 m tall, 39% 0.2-1 m tall, 46% 1-2 m tall, 9% 2-5 m tall.

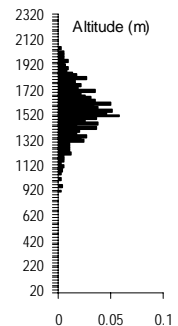
**Pollinators** (67 records): 49% birds, 27% beetles, 19% bees or wasps, 3% flies, 1% butterflies or moths.

**Detailed Pollinators** (47 records): Orange-breasted Sunbird (29), Honey Bee (8), Cape Sugarbird (5), Malachite Sunbird (2), Solitary Bee, Monkey Beetle, Long Proboscid Fly.

**Habitat:**

**Distance to Ocean** (2293 records): 100% inland - further than 2 km from coast.

**Altitude** (2293 records): 380 - 2100 m; 1300 *lq* - 1440 *med* - 1540 *uq*m.



**Landform** (2276 records): 58% shallow soil, 33% deep soil, 8% rocky outcrops.

**Slope** (2283 records): 53% steep incline, 33% gentle incline, 8% hill top, 3% cliff, 2% platform.

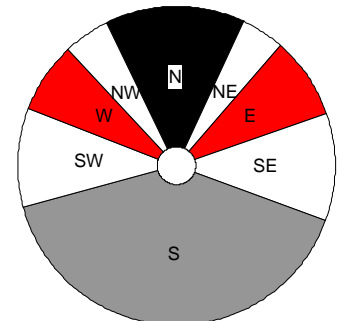
**Aspect** (2064 records): 51% South, 19% North, 15% East, 14% West.

**Soil Type** (2263 records): 42% sandy, 26% loamy, 19% rocky, 10% gravelly, 2% clayey, 1% peaty.

**Soil Colour** (2250 records): 44% grey, 41% brown, 9% black, 2% orange, 2% yellow, 2% white.

**Geology** (2198 records): 91% sandstone, 8% shale

**Vegetation** (2280 records): 98% shrubland, 1% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.  
Occurrence (Fynbos): 18 098 km<sup>2</sup> with 26% conserved and 7% lost; Occupancy: 1 962 km<sup>2</sup> with 45% conserved and 1% lost. Fragmentation index: 3%.  
**Nature Reserves** (2293 records): 55% in nature reserves - well conserved.  
**Habitat destruction** (2191 records): 96% extensive natural habitat, 2% naturally linear habitats, 1% islands.  
**Alien Invasive Species** (2128 records): 91% none, 7% *Pinus*, 1% *Hakea*.  
**Alien Density** (2106 records): 92% alien-free, 8% sparse.

#### **Cultivation & Utilization:**

**Picking** (1574 records): 99% no sign of picking, 0.8% lightly picked, 0.2% severely picked.

**Cultivation Status:** Plantings - 24 records (1%), Escapes - 3 records (0.1%).

**Witch's Broom Infestation:** 5 records (0.2%).

#### **Atlasers Notes:**

##### **Variation**

Narrow leaves (AGR97022722);  
Flowerheads long buds but not shuttlecock - denser with outturned styles in seedhead - no flowers, leaves long base attenuate - not like *P. aurea* seen in next plot, no knobs on style (AGR97022722);

Leaves and flowers much bigger than normal 65-70mm heads 55-60mm styles (AGRY6020801-2);

Interesting area of contact between *P. mundii* and *punctata* (JBB94010403+5, JBB94010501, JBB98121802-3, JBB98121901+3, JCJ97102003);

##### **Mortality**

Half plants almost dead - no flowering! (too dry?) (AGR99032808); Heavy mortality with in patches over half of plants dead. All died during peak new growth from drought (AGRY6020801-2);

Lot of dieback (OUT98050906);  
About 1% escaped the fire (OUT99062603);  
Some killed some escaped (OUTY0032112);  
4 plants escaped fire in shade of rocks - the rest from seeds (RDF95102801); Plants totally burnt out (WMP95010111);

##### **Recruitment**

Lots before the previous fire - many skeletons seen: no recruitment! (AGR99080805); 3 Skeletons (previous generation) for each plant seen (AGRY0093023); The regeneration is very bad - very few seedlings / young plants found amongst what was dense a dense stand (DOA93063008); No young (WIJ92011704);

Parent seedling ratio about 1:20 (AGRY6020801); Parent seedling ratio > 1:20 (AGRY6020802); Has one massive bush and millions of babies have forgotten when the fire was (AWA95022301);

Needs longer than 0.6 yrs to germinate (DOA95101107+11);

##### **Stress**

Very stressed and looked like they were dying. however many did have lots of new growth on the tips and some had flowers or buds - farmer reported very heavy rains in summer 1998? causing some disease and this winter has been the driest on record (WMPY0110401);

Driest winter in recorded history - also heavy summer rains in Dec 1998? - Very stressed and dying (WMPY0110402);

##### **Grazing**

Some leaves obviously chewed by beetles - perhaps their pollinators? (ING93100302); Much chewed/grazed (WMP99060506);

##### **Pollination**

Beetle: cockroach look-alike (DJF93051502); Long Proboscid Flies definitely moved from flower to flower keeps wings humming while feeding about 4 seen feeding 11h00-12h00. Also ordinary flies - but just resting (AGR97042611);

##### **Habitat**

In rocky areas not on flats (AGRY4110610); In rocky outcrops (PMR99060502);

On shale band (AGRY0112516);  
This is the only plot on the Witberg where found! Quite a big but very isolated population (AGRY1071929);

Rainfall must be good for it to inhabit this dry thirsty land (VJK99091805);

**Confusing Species:** Confused with *P. mundii*, and *lacticolor*, but this is the only Cape species with no knob on the pollen presenter and styles curved outwards in cone. In the absence of flowerheads and fruit, it is more difficult to distinguish the species, although *lacticolor* has cordate or truncate leaf bases and *mundii* has slightly longer and greener leaves. It differs from *P. subvestita* which is not a Cape Flora species and also has knobless styles in that the entire involucre bract and style bends outwards on opening, not just the tips. Also with *P. rupicola* before flowering, but this has much wider leaves more obovate rather than oblanceolate.

Records of identification queries = 40.

Records of corrected identification queries = 7.

**Variation and Taxonomy:** Populations in the moister sites, especially Tulbagh to Riviersonderend produce larger more robust leaves approaching those of *P. lacticolor*. Involucre bracts vary from white to pink within all populations.

**Distribution:** Add.

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*Protea subvestita* NE.Br. 1901

**Waterlily Sugarbush**

*Lippeblomsuikerbos*

**Other Common Names:** Lip Flower, Lip Sugarbush, Lip-flower Sugarbush, Lipped Sugarbush, Shaving-brush Protea, Waterlily Protea, *Skeerkwassuikerbos*, *inDlunge* (Xhosa), *isaDlunge* (Xhosa), *isiQalaba* (Xhosa, Zulu), *isiQuane* (Xhosa), *isiQwane*, *Sekila* (S-Sotho), *Seqalaba-se-sesweu* (S-Sotho), *uhinkihlane* (Zulu).

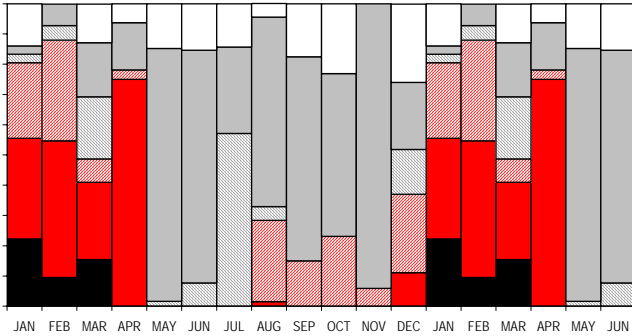
**Other Scientific Names:** *orientalis* Sim 1907.

**407 Records**

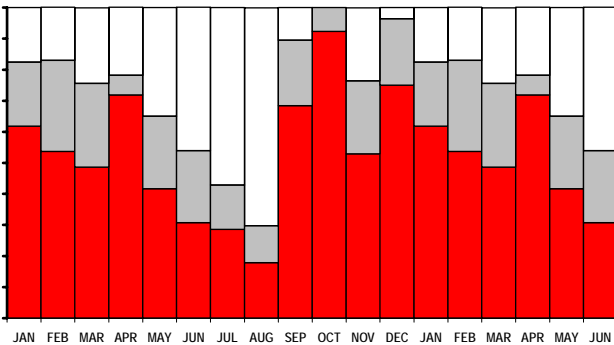
**Population** (401 records): 2% Abundant, 34% Common, 49% Frequent, 14% Rare.

**Dispersion** (380 records): 40% variable, 38% clumped, 12% evenly distributed, 10% widespread.

**Flowering** (394 records with: Jan 36, Feb 42, Mar 39, Apr 32, May 61, Jun 13, Jul 7, Aug 67, Sep 40, Oct 13, Nov 17, Dec 27): Buds from Dec to Feb, Aug and Oct; Flowering from Jan to Apr; Peak Flowering from Jan; Over from Mar and Jul; Fruiting from May to Dec; Nothing from Oct and Dec. Peak levels at 93% in Feb. Historically recorded as flowering from Dec to Jun, with in peak from Jan to Mar.



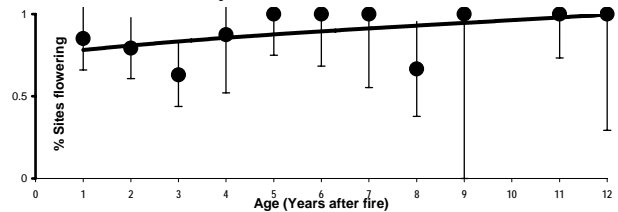
**Growth** (387 records with: Jan 34, Feb 41, Mar 37, Apr 32, May 60, Jun 13, Jul 7, Aug 67, Sep 38, Oct 13, Nov 17, Dec 28): Much from Sep to Jul; Rare from Nov to Mar, May to Jun and Sep; None from Mar to Aug and Nov. Peak levels at 100% in Oct.



**Seedlings** (253 records): Absent in 64%: fewer seedlings than prefire adults in 33 cases, and more in 13 cases. Seedlings found in Jan (6), Feb (2), Mar (9), May (2), Jun (4), Jul, Aug (4), Sep (2), Oct (4), Nov (6) and Dec (6).

**Fire Survival** (139 records): 78% escaped fires in fire-safe areas, 12% resprouted from aerial trunks, 4% survived by seedlings only, 3% eliminated from the area by fires, 3% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100% recorded at 5 years.



**Height** (394 records): 0.8% 0-0.2 m tall, 14% 0.2-1 m tall, 54% 1-2 m tall, 31% 2-5 m tall.

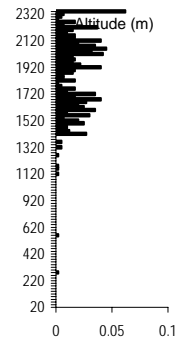
**Pollinators** (69 records): 45% birds, 38% beetles, 7% bees or wasps, 6% flies, 3% none observed, 1% butterflies or moths.

**Detailed Pollinators** (31 records): Malachite Sunbird (25), Great Protea Beetle (3), Transvaal Sugarbird, Protea Rove Beetle, Honey Bee.

**Habitat:**

**Distance to Ocean** (398 records): 100% inland - further than 2 km from coast.

**Altitude** (398 records): 1000 - 2520 m; 1520 *lq* - 1820 *med* - 1960 *uq*m.



**Landform** (397 records): 48% deep soil, 36% shallow soil, 13% rocky outcrops, 3% riverine.

**Slope** (395 records): 58% steep incline, 24% gentle incline, 8% hill top, 6% cliff, 2% platform, 2% valley bottom.

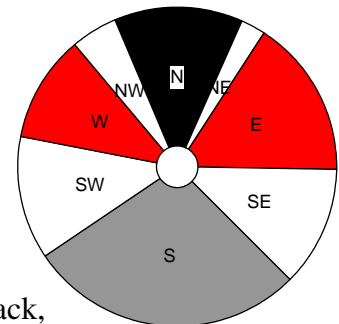
**Aspect** (360 records): 40% South, 23% East, 20% West, 17% North.

**Soil Type** (386 records): 68% loamy, 19% sandy, 6% rocky, 5% gravelly, 2% clayey.

**Soil Colour** (386 records): 65% brown, 19% grey, 8% black, 4% yellow, 4% orange.

**Geology** (331 records): 59% sandstone, 20% basalt, 10% dolerite, 9% shale, 2% granite.

**Vegetation** (391 records): 52% grassland, 27% shrubland, 13% wooded grassland, 6% thicket, 1% forest.





**Conservation Status and Threat:****Red Data List Status:** Vulnerable

B2a(i)b(iii,v).

Occurrence: 113 520 km<sup>2</sup> with 3% conserved and 23% lost; Occupancy: 611 km<sup>2</sup> with 46% conserved and 8% lost. Fragmentation index: 1%.**Nature Reserves** (398 records): 49% in nature reserves.**Habitat destruction** (376 records):

74% extensive natural habitat, 14% naturally linear habitats, 8% islands, 2% naturally fragmented habitats, 1% road verges.

**Alien Invasive Species** (325 records):58% none, 20% Fabaceae (chiefly alien *Acacia*), 18% *Pinus*, 4% other aliens.**Alien Density** (324 records): 58% alien-free, 30% sparse, 6% abundant, 5% dense.**Cultivation & Utilization:****Picking** (306 records): 95% no sign of picking, 4% lightly picked, 0.7% severely picked.**Cultivation Status:** Plantings - 3 records (0.7%).**Atlassers Notes:****Size class variation**

Many seedlings of different sizes and 3 large shrubs (trees) (MHO92102903);

Only 2 of them close together lots of seedlings of different ages all around them (NFG93120701);

All roughly same height (PAN92052801);

Two distinct sizes: 4 and 2 (SRI99090401);

**Variation**

Leaves broader than usual and no petiole! (OUTY1030102);

White or cream (PAN93010102); White and one perfect "pretty pink" (PAN96041101);

Most plants had yellow flowers but also some with pink (ODE94030501); Both pink and white (AGR99081606); Both carmine and cream coloured (NJH93091201); Mostly pink; few white (PAN95010302); Pinkish (DDS94022601); Pink (NSC95101802); Dark red (PAN98092701);

Now pink - previously all were white (PANY1010301); White buds and pink flowers (PANY1030601);

**Fire survival**

Occurs only as a fire escapee (ATA92030401); 2 plants had been fire damaged about 50% of the foliage was destroyed (BRB97062802); Plants were all in and around rocks and boulders and had not been reached by very recent burn (BRB97062804-6); Controlled burn sept 98: survived between the 2 streams where the did not reach (BRB99011702); Escaped fire by its concentration along road verge and pass cutting - road acted as fire break (DFJ99081804); Growing in area where it appears that fire hasn't been for a number of years (IAG94112702);

Large plants completely destroyed by fire, others surviving (CGH92122701); Few plants killed by fire - fire during Jul - Aug 94 (6 Months) (DDS94120803); A few trees killed by fire which penetrated thicket (LOTY0021901);

Thriving in a frequently-burned fire break next to the road (IAG94081006);

**Recruitment**

Small isolated patch on the lower NW flank of Tor Doone has suffered badly from fire and grazing cattle (PAN96121403);

Not all plants killed: 10% of plants in moist areas next to stream have survived (RHEY1092401); most trees killed but some (&lt;10%) in more rocky habitat have survived (RHEY1092404);

Many large dead trees (&gt;2m) were lying on the slope. it appears that it is killed by (hot) fires - no seedlings near the parent canopies: all had germinated on the path (MHO92102904); Many skeletons on top of Gaika the result of yearly controlled burning of entire mountain (PANY1030601); Burnt down 1 year ago - no seedlings despite good summer rains - why? (SRIY0040905); Many bushes burnt a few patches spared (WIJ92090802-03);

Thick population of hundreds of thousands young plants - very few adult plants seen (NJH93091201); Extensive seedling growth after huge fire (PAN95123001);

**Stress**

Some young, older trees very stressed (AWA97052902); Stressed (AWA97052903); Why killed? No fire! Drought? (LKAY1031602);

Healthy population in full flower unscathed by late December tornado which flattened cell phone mast: now alas re-erected (PAN99020521);

New growth damaged [cold?] (AWA97052904);

**Leaf damage**

New leaves at tips of shoots wrapped together as with spider webs (PAN92052801);

Mieliebug (WMP99081601);

About 25% of growing tips attacked by caterpillars (NJH93091101);

Grazed by game only (behind fences) and young plants were being selectively browsed (DFJ99082002); Young plants grazed (SRI99082004); Not resprouting - grazed (WIJ96100201);

**Harvesting**

Large plants harvested for wood (SRI99082003); Very little chopping (SRI99082004); Wood-cutting of dead protea trees by local population (WIJ99032806); Cutting of dead trees and branches by local population (WIJ99032807); Harvesting (WMP99081907);

Baboons damaging heads (WMP99081601);

**Pollination**

Seven Malachite Sunbirds (ADF99032001); Dozens of Malachite Sunbirds (PAN98012101); Malachite males and females very active (PAN99020521);

Furry brown beetles and paper wasps (PAN92122803); Brown beetle - large; green beetles - small (PAN93010101+2); 25mm brown furry beetles; 0.5cm green beetles (PAN93010102);

Long flies and ants (WIJ99032804); Long flies (WIJ99032806+7);

Wasp with red and black stripes - also flies & ants. Were in flowers and especially on the floral bracts - these were not present on *P. roupelliae* (WIJ99032901);



Bud with elongated beetle attached to outer bracts - the computer won't like it!  
(PANY0061901);

***Extensive notes on landscape distribution, population size and habitat preferences omitted.***

**Confusing Species:** As the only White Water Protea in summer-rainfall area, identification errors were rare, except where planted.

Confused with *P. mundii*.

Records of identification queries = 19.

Records of corrected identification queries = 3.

**Variation and Taxonomy:** Variation in leaf hairiness and colour are known. In the eastern Cape leaves tend to be dark green

with the pubescence of the young leaves easily and rapidly rubbing off. In the Drakensberg and especially at higher altitudes the shaggy, silvery-grey pubescence may persist for months, leaving dull olivaceous leaves when falling off.

Flowerheads may be carmine, pink or creamy-white, usually co-occurring in various proportions with intermediates.

**Distribution:** Add.

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*Protea "mininigromontana" nomen nudum*

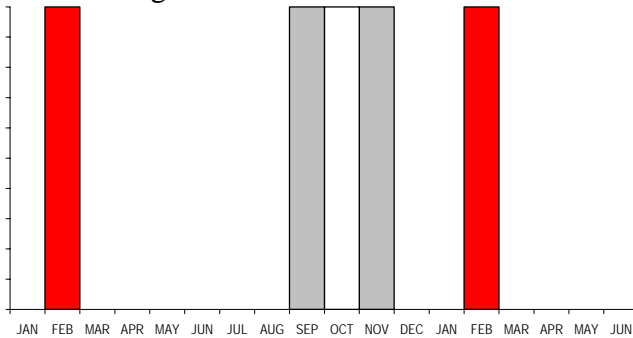
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**4 Records**

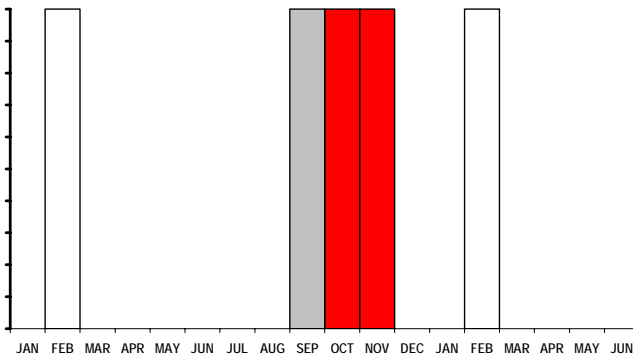
**Population** (4 records): 25% Common, 75% Frequent.

**Dispersion** (4 records): 100% clumped.

**Flowering** (4 records with: Jan 0, Feb 1, Mar 0, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 1, Oct 1, Nov 1, Dec 0): Buds, Peak Flowering and Over not recorded; Flowering from Feb; Fruit from Sep and Nov; Nothing from Oct. Peak levels unreliable. Historically no flowering data.



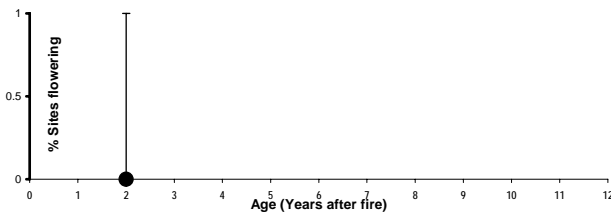
**Growth** (4 records with: Jan 0, Feb 1, Mar 0, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 1, Oct 1, Nov 1, Dec 0): Much from Oct to Nov; Rare from Sep; None from Feb. Peak levels unreliable.



**Seedlings** (1 record): All without any seedlings present.

**Fire Survival** (1 record): 100% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 15 years, 0% at 2 years.



**Height** (4 records): 25% 0.2-1 m tall, 50% 2-5 m tall, 25% taller than 5 m.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (3 records): 100% inland - further than 2 km from coast.

**Altitude** (3 records): 960 - 1020 m; 960<sub>lq</sub> - 980<sub>med</sub> - 980<sub>uq</sub> m.

**Landform** (3 records): 33% riverine, 33% deep soil, 33% shallow soil.

**Slope** (3 records): 67% gentle incline, 33% steep incline.

**Aspect** (3 records): 33% East, 33% South, 33% West.

**Soil Type** (3 records): 100% sandy.

**Soil Colour** (3 records): 67% grey, 33% brown.

**Geology** (3 records): 100% sandstone.

**Vegetation** (3 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Endangered B1a(i,ii)c(iv)+2a(i,ii)c(iv).

**Occurrence** (Fynbos): 9 km<sup>2</sup> with 46% conserved and 0% lost; **Occupancy:** 6km<sup>2</sup> with 50% conserved and 0% lost. **Fragmentation index:** 55%.

**Nature Reserves** (3 records): 33% in nature reserves.

**Habitat destruction** (3 records): 67% extensive natural habitat, 33% naturally linear habitats.

**Alien Invasive Species** (3 records): 100% none.

**Alien Density** (3 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (4 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlasers Notes:**

Atlased as *Protea mundii* met die lang blare not yet in flower (TOW94092601); About 30 plants (DOA94112404);

**Confusing Species:** Floral features very similar to *P. subvestita*, but leaves resemble long *P. mundii*. No incorrect identifications recorded: was noted by rangers as strange.

Records of identification queries = 4.

Records of corrected identification queries = 4.

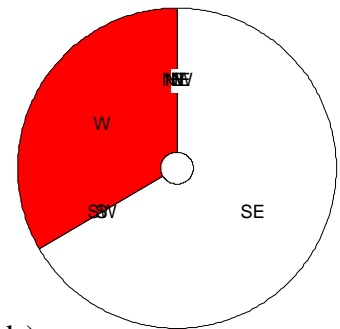
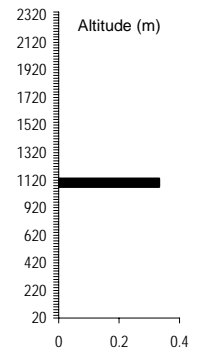
**Variation and Taxonomy:** None known.

**Distribution:** Add.

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*Protea venusta* Compton 1944  
**Cascade Sugarbush**  
*Rotssuikerbos*

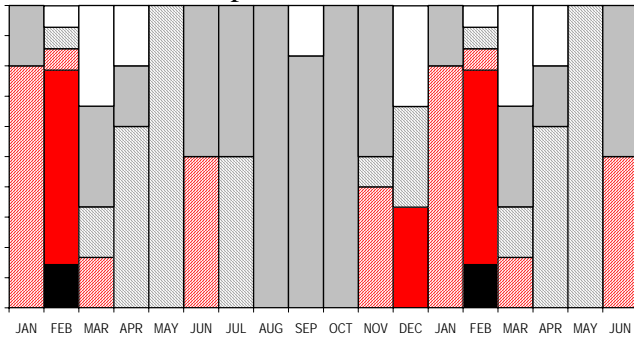
**Other Common Names:** Creeping Beauty, Ground Sugarbush, Pinktiprock Protea, Swartberg Sugarbush.  
**Other Scientific Names:** *None*.

**74 Records**

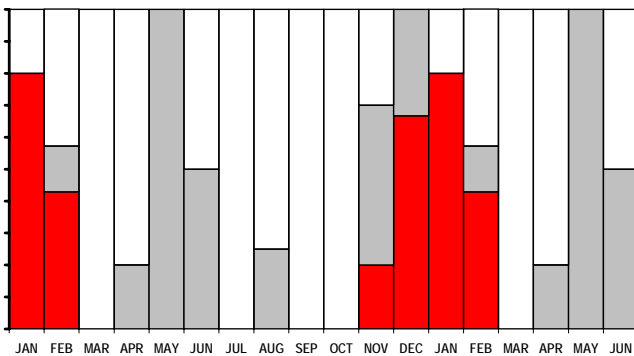
**Population** (74 records): 5% Common, 54% Frequent, 41% Rare.

**Dispersion** (62 records): 53% variable, 42% clumped, 3% evenly distributed, 2% widespread.

**Flowering** (73 records with: Jan 5, Feb 14, Mar 6, Apr 5, May 2, Jun 2, Jul 2, Aug 4, Sep 6, Oct 14, Nov 10, Dec 3): Buds from Jan, Jun and Nov; Flowering from Feb and Dec; Peak Flowering not significant; Over from Apr to May, Jul and Dec; Fruit from Jan, Mar to Apr, Jun to Nov; Nothing from Mar to Apr and Dec. Peak levels at 93% in Feb. Historically recorded as flowering from Jan to Mar, with a peak in Jan to Feb.



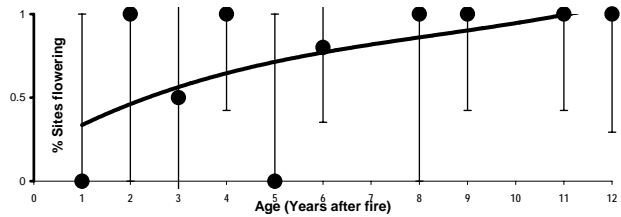
**Growth** (71 records with: Jan 5, Feb 14, Mar 6, Apr 5, May 2, Jun 2, Jul 2, Aug 4, Sep 5, Oct 13, Nov 10, Dec 3): Much from Nov to Feb; Rare from Apr to Jun, Aug and Nov to Dec; None from Jan to Apr and Jun to Nov. Peak levels unreliable at 100% in Dec



**Seedlings** (23 records): Absent in 91%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jun.

**Fire Survival** (8 records): 63% escaped fires in fire-safe areas, 25% survived by seedlings only, 13% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 3-5 years, and 100% recorded consistently at 8 years.



**Height** (74 records): 31% 0-0.2 m tall, 69% 0.2-1 m tall.

**Pollinators** (4 records): 25% birds, 25% mammals, 25% bees or wasps, 25% flies.

**Detailed Pollinators** (2 records): Orange-breasted Sunbird, Honey Bee.

**Habitat:**

**Distance to Ocean** (73 records): 100% inland - further than 2 km from coast.

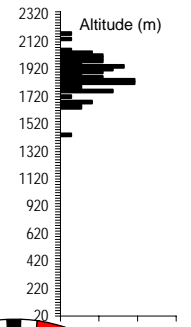
**Altitude** (73 records): 1320 - 2080 m; 1700 *lq* - 1740 *med* - 1800 *uq*m.

**Landform** (73 records):

55% shallow soil, 30% rocky outcrops, 15% deep soil.

**Slope** (73 records): 78% steep incline, 14% cliff, 4% gentle incline, 4% hill top.

**Aspect** (68 records): 71% South, 13% East, 13% West, 4% North.



**Soil Type** (71 records):

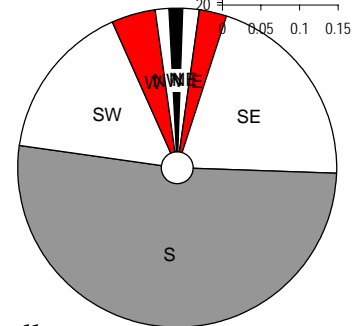
38% loamy, 35% sandy, 17% rocky, 6% gravelly, 4% peaty.

**Soil Colour** (69 records):

42% grey, 35% black, 22% brown, 1% yellow.

**Geology** (72 records): 96% sandstone, 4% shale.

**Vegetation** (73 records): 97% shrubland, 3% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Endangered A4c, B1a(i)b(v)+2a(i)b(v).

**Occurrence** (Fynbos): 1 356 km<sup>2</sup> with 53% conserved and 1% lost; **Occupancy:** 117 km<sup>2</sup> with 76% conserved and 0% lost.

**Fragmentation index:** 5%.

**Nature Reserves** (73 records): 84% in nature reserves - well conserved.

**Habitat destruction** (68 records): 94% extensive natural habitat, 4% naturally linear habitats, 1% naturally fragmented habitats.

**Alien Invasive Species** (67 records): 99% none, 1% *Pinus*.

**Alien Density** (67 records): 99% alien-free, 1% sparse.

**Cultivation & Utilization:**

**Picking** (54 records): 98% no sign of picking, 2% severely picked.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

**Size**

7m across! (AGR97022707); Grand protea - diam. across: 5m! (OUT98050907);

**Fire survival and recruitment**

Two height classes 2 and 1: several averaging 4-5m in diameter. Found one plant of 8m spread. Obviously some of these bigger plants escaped 1 or 2 previous fires as the general veld age is as 11 yrs (DOA92112613); These 2 plants must have escaped the previous 1 or 2 fires (DOA92112614); Average spread of mature plants 4-6m, also several young plants of up to 0.5m spread (DOA93012209); Also consisting of many mature and young plants (DOA93012210);

The records show this as 7 yrs old but I am sure this veld is much older as there are some large (3-4m across) plants - most probably a mapping error (DOA92091607);

This is one of the better sites for *venusta*: the veld is 5 yrs but a few ( about 20) escaped

the fire. The regeneration is good (DOA93022007);

Some fairly large plants escaped fire (JBB97121802); Very old plants sprawled across rock face (OUT97060702);

**Population sizes**

There could be up to about 100 plants (DOA92112613); 2 plants 4-5m in diam. (DOA92112614); Population about 250 (DOA93012211-13); The total count could be around 400 (DOA93022007);

Blesberg has always been regarded as the eastern extension in the Swartberg. This sight record is the new easter extension 7.5km from Blesberg (DOA93012211);

**Pollination**

Gnawing and feeding by mice on open flowerheads (AGR97022706);

**Confusing Species:** None noted..

Records of identification queries = 1.

**Variation and Taxonomy:** Hybrids with *P. punctata* are erroneously labeled as *P. venusta*: these occur naturally at Blesberg and tend to be 1-2m tall and not sprawling.

**Distribution:** Add.

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*Protea acuminata* Sims 1814  
**Blackrim Sugarbush**  
*Sederbergroos*

**Other Common Names:** Cedarberg Sugarbush, Cedarberg-rose *Protea*, *Angelprotea*, *Bergrosie*, *Bierbos*.

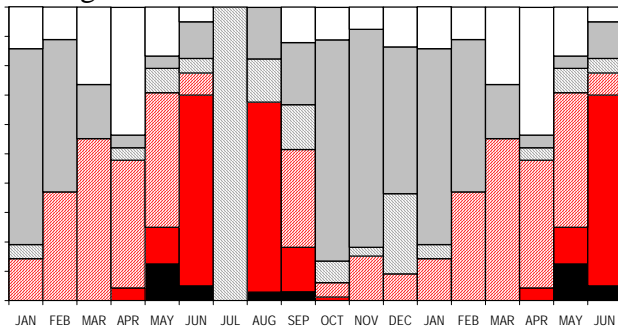
**Other Scientific Names:** *cedromontana* Schltr 1900.

**505 Records**

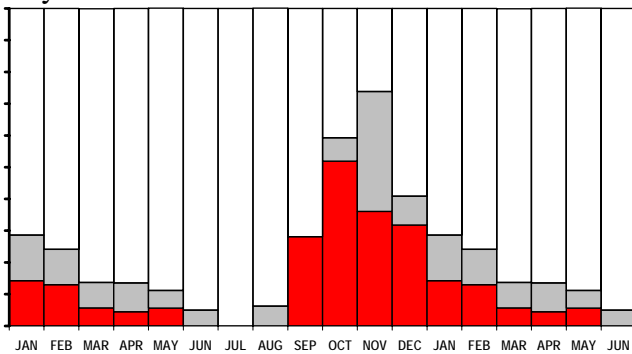
**Population** (497 records): 18% Common, 60% Frequent, 21% Rare, 1% Extinct.

**Dispersion** (445 records): 64% variable, 31% clumped, 3% widespread, 2% evenly distributed.

**Flowering** (488 records with: Jan 21, Feb 54, Mar 87, Apr 23, May 24, Jun 40, Jul 3, Aug 34, Sep 33, Oct 81, Nov 66, Dec 22): Buds from Feb to May and Sep; Flowering from Jun to Aug; Peak Flowering not significant; Over from Jul and Dec; Fruit from Sep to Feb; Nothing from Mar to Apr. Peak levels at 83% in Jun. Historically recorded as flowering from Jun to Sep, peaking Jul to Aug.



**Growth** (473 records with: Jan 21, Feb 54, Mar 87, Apr 22, May 18, Jun 40, Jul 3, Aug 32, Sep 32, Oct 81, Nov 61, Dec 22): Much from Sep to Dec; Rare from Nov; None from all year round. Peak levels at 74% in Nov.



**Seedlings** (178 records): Absent in 85%; fewer seedlings than prefire adults in 7 cases, and more in 6 cases. Seedlings found in Jan, Mar (9), Oct (2) and Dec.

**Fire Survival** (38 records): 82% survived by seedlings only, 11% escaped fires in fire-safe areas, 5% resprouted from underground boles, 3% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded consistently at 9 years.



**Height** (489 records): 7% 0-0.2 m tall, 70% 0.2-1 m tall, 22% 1-2 m tall.

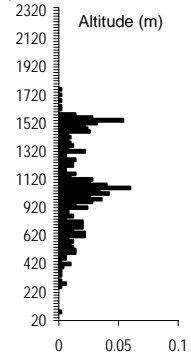
**Pollinators** (6 records): 67% bees or wasps, 17% birds, 17% beetles.

**Detailed Pollinators** (3 records): Honey Bee.

**Habitat:**

**Distance to Ocean** (495 records): 100% inland - further than 2 km from coast.

**Altitude** (495 records): 60 - 1660 m; 760 *lq* - 960 *med* - 1140 *uq*m.

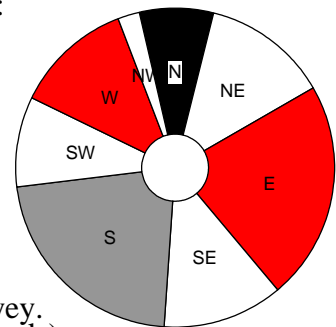


**Landform** (488 records): 72% deep soil, 22% shallow soil, 6% rocky outcrops.

**Slope** (492 records): 56% gentle incline, 25% steep incline, 11% platform, 5% hill top, 2% valley bottom.

**Aspect** (426 records):

36% East,  
 33% South,  
 18% West,  
 13% North.



**Soil Type** (488 records): 57% sandy, 17% gravelly, 17% loamy, 6% rocky, 3% clayey.

**Soil Colour** (485 records): 45% brown, 34% grey, 7% yellow, 6% orange, 5% white, 2% red.

**Geology** (481 records): 73% sandstone, 21% shale, 5% silcrete or ferricrete.

**Vegetation** (493 records): 98% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence (Fynbos):** 7 755 km<sup>2</sup> with 18% conserved and 16% lost; **Occupancy:** 473 km<sup>2</sup> with 30% conserved and 4% lost. **Fragmentation index:** 5%.

**Nature Reserves** (495 records): 40% in nature reserves.

**Habitat destruction** (485 records): 91% extensive natural habitat, 5% islands,

2% naturally linear habitats, 1% naturally fragmented habitats.

**Alien Invasive Species** (466 records):  
62% none, 26% *Hakea*, 9% *Pinus*,  
2% Myrtaceae.

**Alien Density** (463 records): 63% alien-free,  
28% sparse, 8% abundant, 1% dense.

**Cultivation & Utilization:**

**Picking** (318 records): 99% no sign of picking,  
0.6% lightly picked.

**Cultivation Status:** Plantings - 4 records  
(0.8%).

**Witch's Broom Infestation:** 5 records (1.0%).

**Atlassers Notes:**

**Height**

2m high (JAG95090301);

**Variation**

Plant had only green flowerheads as opposed to  
the usual red (NGF98062805);

**Flowering**

One seed head present flowered already during  
third season after fire (cf Rourke: 5years)  
(EAH97123101);

No flowering - 4-5yrs after fire  
(WMP93103001);

Plants no more than 0.4m high: only one with 8  
flowerheads, another seven with none or at  
most one head (EAHY0092503);

Profusely covered with flowers - lots and lots  
(WIJ94041308);

**Stress**

Plants are half dead, but much new growth from  
buds in stems that had dropped leaves  
(AGRY0112616);

Several plants dying of drought  
(WIJ94041308);

**Recruitment**

Many young plants around dead plants  
(AWAY0101407); Survived relatively well:  
18 live plants versus only four skeletons  
(EAH99092501);

Parent seedling ratio is 10:1 (AGRY5122907);  
Some dead, but no young plants  
(AWAY1032303);

Some old bushes survived fire (JAT94111902);  
Looks as if species recovers from fire  
(JAT94111906); Resprout from low down on  
trunk - growing at roadside (WIJ94102507);  
Has the same growth habit as *P. repens*  
(NGF96082409);

**Mortality**

Dead because of drought (CWR99051101); One  
skeleton only (AGR96082105,  
AGRY1032311);

More than half plants seen were dead  
(AGR92082907); 1/3 of plants dead  
(AGRY1022504);

15-25% of plants are recently dead perhaps due  
to root fungus *Phytophthora*  
(NAH98041901);

Previous 7 plants could not be found: 5 new  
found on solid rock slab with very little soil  
about 300mm high. Will probably not  
survive - because of drought  
(CWR99051101);

The farmer of Meulsteenvlei Mr Brauer knows  
of patches on his farm but thinks many have  
died on account of previous drought. We  
looked at one - this plot and found none - he  
will notify the office if he finds the others  
(WIJ93082903);

**Population**

About 25 plants found confined to this locality  
only (EAH99010301); Clumps of only just  
more than 10 (JAT95042002); 40 plants -  
clump (WEPY0091501);

Clumped along road (AWA96100905);

Only in 1 small clump lower down path -  
mostly above Welbedacht Cave  
(JAT92080103);

Only patch ever found on Swartberg (Olifants  
River Mtn) in 20 years of walking  
(EAH98093001);

2 local farmers say this is the only place in the  
area where *acuminata* is known to grow  
(WIJ94102507);

**Pollination**

Visited by ants (AGR96101403);

**Harvesting**

Picked by the farmer (NSC95083013);

**Confusing Species:** When not in flower very  
easily mistaken for *P. repens*, but leaves  
usually narrower when co-occurring.  
Mistaken for *P. witzenbergiana* (erect form)  
and *P. nana*, but both of these have  
pendulous heads, and lack the characteristic  
black rim to the involucre bracts.

Records of identification queries = 15.

Records of corrected identification queries = 2.

**Variation and Taxonomy:** The most robust  
forms are found in the northern arid areas.  
No other variation noted.

**Distribution:** Add.

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*Protea canaliculata* Andrews 1803  
**Groove-leaf Sugarbush**  
*Bergroossuikerbos*

**Other Common Names:** Mountain-rose Sugarbush, Paeony-flower Erodendrum, Swartberg-rose Protea, *Bergroos*, *Swartbergroos*.

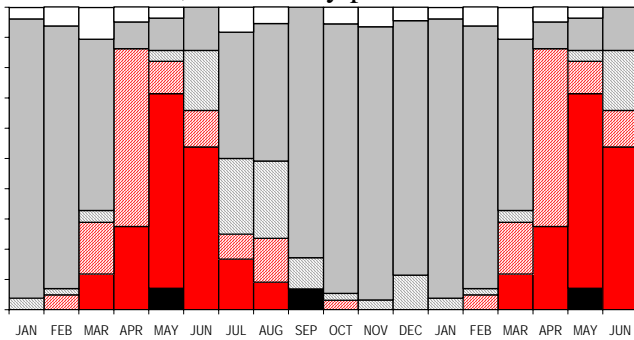
**Other Scientific Names:** *harmeri* Phill 1911, *paeniflorum* (Salisb. ex Knight) 1809.

**760 Records**

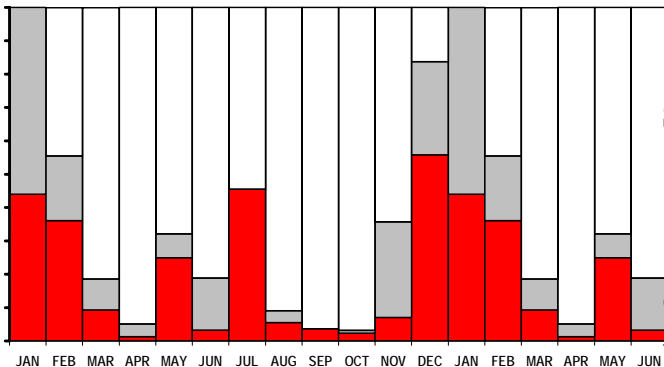
**Population** (753 records): 26% Common, 60% Frequent, 14% Rare.

**Dispersion** (691 records): 76% variable, 18% clumped, 4% widespread, 2% evenly distributed.

**Flowering** (744 records with: Jan 26, Feb 144, Mar 76, Apr 80, May 28, Jun 91, Jul 12, Aug 55, Sep 29, Oct 128, Nov 31, Dec 44): Buds from Apr; Flowering from Apr to Jun; Peak Flowering not significant; Over from Jun to Aug; Fruit from Jul to Mar; Nothing not significant. Peak levels at 86% from Apr to Jun. Historically recorded as flowering from Mar to Jun, with a May peak.



**Growth** (729 records with: Jan 25, Feb 144, Mar 75, Apr 79, May 28, Jun 90, Jul 11, Aug 55, Sep 27, Oct 124, Nov 28, Dec 43): Much from Dec to Feb, May and Jul; Rare from Nov to Jan; None from Feb to Nov. Peak levels at 100% in Jan.



**Seedlings** (238 records): Absent in 97%; fewer seedlings than prefire adults in 3 cases, and more in 1 case. Seedlings found in Jan, Jul (2) and Nov.

**Fire Survival** (19 records): 42% survived by seedlings only, 37% eliminated from the area by fires, 21% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-5 years, and 100% estimated at 11 years.



**Height** (744 records): 2% 0-0.2 m tall, 68% 0.2-1 m tall, 29% 1-2 m tall.

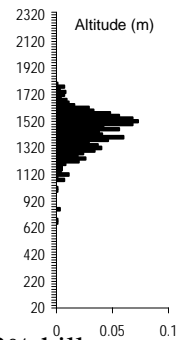
**Pollinators** (11 records): 45% bees or wasps, 36% birds, 9% mammals, 9% flies.

**Detailed Pollinators** (6 records): Honey Bee (3), Cape Sugarbird (2), Orange-breasted Sunbird.

**Habitat:**

**Distance to Ocean** (755 records): 100% inland - further than 2 km from coast.

**Altitude** (755 records): 640 - 1700 m; 1240 *lq* - 1360 *med* - 1420 *uq*m.



**Landform** (749 records): 63% shallow soil, 32% deep soil, 5% rocky outcrops.

**Slope** (753 records): 42% steep incline, 40% gentle incline, 12% hill top, 4% platform, 2% cliff.

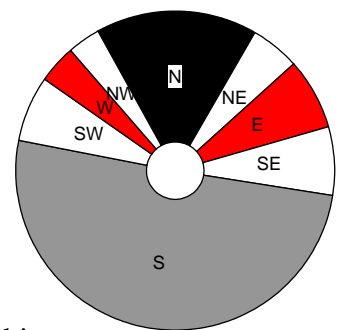
**Aspect** (661 records): 58% South, 20% North, 13% East, 9% West.

**Soil Type** (746 records): 35% sandy, 27% loamy, 22% rocky, 14% gravelly.

**Soil Colour** (745 records): 46% brown, 40% grey, 7% orange, 3% yellow, 2% white, 1% black, 1% red.

**Geology** (697 records): 93% sandstone, 7% shale.

**Vegetation** (752 records): 99% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 3 375 km<sup>2</sup> with 33% conserved and 2% lost; **Occupancy:** 639 km<sup>2</sup> with 29% conserved and 1% lost. **Fragmentation index:** 8%.

**Nature Reserves** (755 records): 32% in nature reserves.



**Habitat destruction** (742 records):  
97% extensive natural habitat, 2% naturally linear habitats.

**Alien Invasive Species** (734 records):  
95% none, 4% *Pinus*.

**Alien Density** (721 records): 97% alien-free, 3% sparse.

**Cultivation & Utilization:**

**Picking** (561 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 5 records (0.7%).

**Atlassers Notes:**

**Variation**

Some had shrubby habit and some were low sprawlers (SMR99080701);

**Stress**

About 90% of flowers aborted (DOA94082202); About 90% of flowers were aborted (dry season?) (DOA94100601); Some dead. lots have lost last years leaves and look sick - previous years leaves ok - this years leaves at tips of bare branches (AGRY1020714);

**Recruitment**

Patchy fire - a few small stands of mature vegetation with plants (ASP94100929); Most found on rocky outcrop: old and scraggily (WMP99060507);

Interfire recruitment common (PMR99060504); Tens of skeletons - no signs of young or seedlings despite veld apparently over 1 year old! (AGR97042701); Skeletons x100's: no

seedlings or young David Osborne says fire was over 1 year ago! Gone? (AGR97042703); Lots more skeletons suggest that this plant was more common before the fire (AGR99080805); One skeleton seen from previous fire - nothing this cycle (AGRY1020705);

**Pollination**

Flowers - chewed by rodents (AGR98040708);

**Confusing Species:** Mistaken for *P. acuminata* which has flattened, not channeled leaves and usually red flowerheads.

Records of identification queries = 3.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** There are two main forms of this species:

- Western form on the Langeberg and northern foothills: leaves narrow, needle-like, deep green hairless; involucre bracts dark, wine red and hairless.
- Northern form on the Witteberg and Swartberg: glaucous, broader leaves, often pubescent; involucre bracts pale pinkish-red, sparsely sericeous.

Atlassers did not comment on this variation.

**Distribution:** Add.

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*Protea scolymocephala* (L.) Reichard 1737, <date>

**Thistle Sugarbush**

*Witskollie*

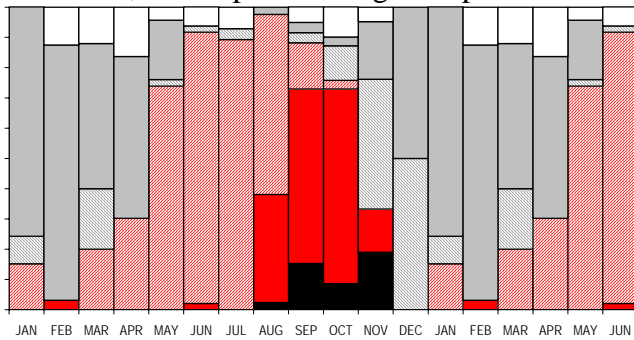
**Other Common Names:** Mini Sugarbush, Scoly, Scolymus-flower Erodendrum, Small-green Sugarbush, *Bergrosie*, *Kleingroenroos*.  
**Other Scientific Names:** *scolymiflorum* Salisb. ex Knight 1809, *scolymus* Thunb, 1781.

**475 Records**

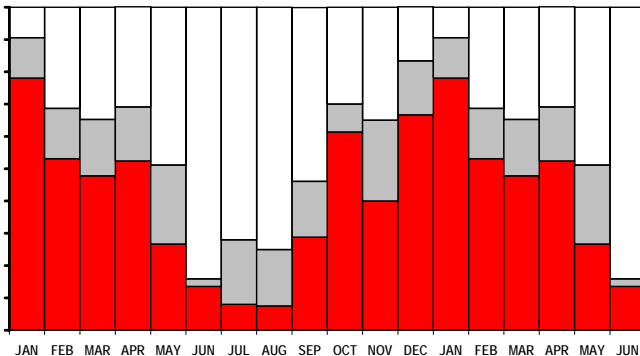
**Population** (438 records): 15% Common, 54% Frequent, 30% Rare, 1% Extinct.

**Dispersion** (378 records): 65% variable, 30% clumped, 3% widespread, 2% evenly distributed.

**Flowering** (465 records with: Jan 33, Feb 32, Mar 25, Apr 43, May 46, Jun 48, Jul 28, Aug 42, Sep 59, Oct 70, Nov 21, Dec 18): Buds from Mar to Aug; Flowering from Aug too Oct; Peak Flowering from not significant from Sep to Nov; Over from Mar and Nov to Dec; Fruit from Dec to May; Nothing not significant. Peak levels at 98% in Aug. Historically recorded as flowering from Jul to Nov, with a peak in Aug to Sep.



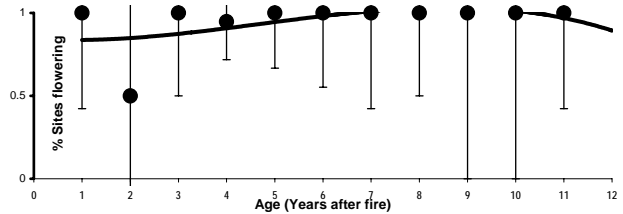
**Growth** (443 records with: Jan 32, Feb 32, Mar 23, Apr 42, May 45, Jun 44, Jul 25, Aug 40, Sep 52, Oct 70, Nov 20, Dec 18): Much from Sep to May; Rare from May, Jul and Nov; None from Feb to Nov. Peak levels at 91% in Jan.



**Seedlings** (167 records): Absent in 81%: fewer seedlings than prefire adults in 10 cases, and more in 6 cases. Seedlings found in Jan, Feb (3), Mar (3), Apr (2), Aug (3), Sep, Oct (2) and Nov.

**Fire Survival** (39 records): 51% survived by seedlings only, 28% escaped fires in fire-safe areas, 18% eliminated from the area by fires, 3% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1-2 years, and 100% recorded consistently at 5 years.



**Height** (462 records): 3% 0-0.2 m tall, 75% 0.2-1 m tall, 22% 1-2 m tall.

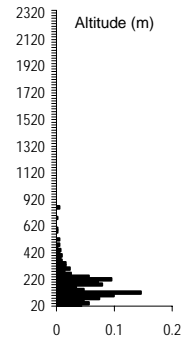
**Pollinators** (6 records): 67% beetles, 33% bees or wasps.

**Detailed Pollinators** (3 records): Solitary Bee, Monkey Beetle, Honey Bee.

**Habitat:**

**Distance to Ocean** (411 records): 71% inland - further than 2 km from coast.

**Altitude** (411 records): 20 - 600 m; 80 *lq* - 120 *med* - 140 *uq*m.



**Landform** (411 records): 91% deep soil, 6% shallow soil, 2% swamp, 1.0% rocky outcrops.

**Slope** (410 records): 52% gentle incline, 33% platform, 6% valley bottom, 5% steep incline, 3% hill top, 2% dunes.

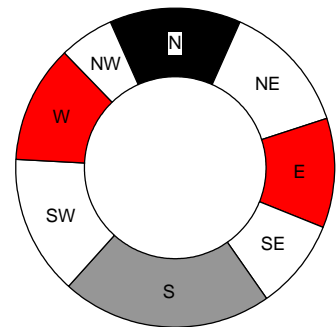
**Aspect** (301 records): 32% South, 24% East, 22% North, 22% West.

**Soil Type** (410 records): 92% sandy, 5% loamy, 1% gravelly, 1.0% clayey.

**Soil Colour** (408 records): 50% grey, 23% white, 16% brown, 6% yellow, 4% orange, 2% red.

**Geology** (391 records): 51% sandstone, 41% Tertiary sands, 4% shale, 3% silcrete or ferricrete, 1% granite.

**Vegetation** (411 records): 99% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable A2c.

Occurrence (Fynbos): 8 965 km<sup>2</sup> with 11% conserved and 40% lost; Occupancy: 357 km<sup>2</sup> with 21% conserved and 30% lost. Fragmentation index: 2%.

**Nature Reserves** (411 records): 52% in nature reserves - well conserved.

**Habitat destruction** (404 records):  
83% extensive natural habitat, 9% islands,  
3% road verges, 3% naturally linear habitats,  
1% naturally fragmented habitats.

**Alien Invasive Species** (406 records):

82% Fabaceae (chiefly alien *Acacia*),  
13% none, 3% Myrtaceae, 2% *Pinus*.

**Alien Density** (406 records): 13% alien-free,  
50% sparse, 22% abundant, 12% dense,  
2% impenetrable.

**Cultivation & Utilization:**

**Picking** (318 records): 99% no sign of picking,  
0.6% lightly picked, 0.6% severely picked.

**Cultivation Status:** Plantings - 30 records  
(6%), Augmentations - 1 record (0.2%),  
Escapes - 4 records (0.8%).

**Witch's Broom Infestation:** 6 records (1%).

**Atlassers Notes:**

**Browsing**

Some grazed! (AGR95040405);

**Fire survival and recruitment**

Many dead, some resprouting (!!), some  
escaped (AKS94072002);

Large patch of burnd out with two plants which  
escaped and no seedlings (DJL98091805);

2 young plants found near a burnt skeleton - no  
more seedlings found (LYM95090303);

1 dead skeleton seen no seedlings  
(AGRY0111515);

**Mortality**

Very sparse 1 dead for every 1 live  
(AGRY0082514+15);

Massive dieback after clearing aliens  
(CHE96062704);

**Population distribution**

Only one large old skollie (CNR95083102);

About 20 plants most along side of road; a few  
dead ones (CVV98020808);

In drainage lines with heaviest acacia  
infestations! (AGR92072202);

In middle of road - searches in alien stands and  
clearings revealed no others  
(AGRY4050106);

About 20 skollies along the southern boundary  
of plot along an old road storm water drain  
(CVV97090601); The plants are growing on  
either side of a culvert in a straight line - I  
could not locate any at a significant distance  
from the culvert: I therefore question  
whether this protea is planted at this site - no  
seed blown into culvert (NGF99071101);

**Witches Broom**

Lots of bad WB attack (AGR92072202); A

Very bad infection! (AGR92072204);

On several (SMR99091708);

**Seed dispersal**

After trying to get cones to release seeds, Pat  
Holmes (pers. comm. 2005) reports that Rod  
Saunders suggested wetting the cones as the  
only way to get the cones to open. It works.  
Suggests that Skollies hold seeds after a fire  
until the autumn rains – not confirmed in  
field yet.

**Confusing Species:** None noted.

Records of identification queries = 4.

**Variation and Taxonomy:** Add.

**Distribution:** Add.

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*Protea nana* (Bergius) Thunb. 1766, 1781  
**Mountain-rose Sugarbush**  
*Skaamrosie*

**Other Common Names:** Needle-leaf Erodendrum, Nodding Mountain-rose, Bergroos, Skaablom, Skaamroos, Warebergroos.

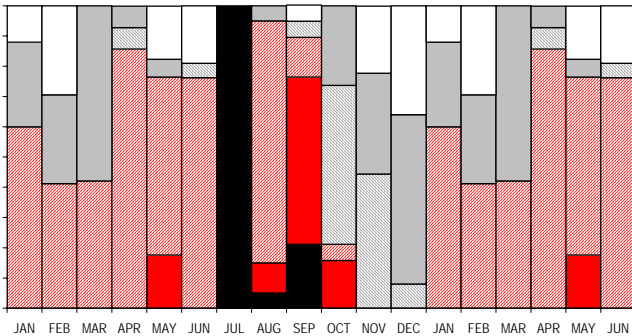
**Other Scientific Names:** *acuifolia* Salisb 1805, *rosacea* L 1771.

**232 Records**

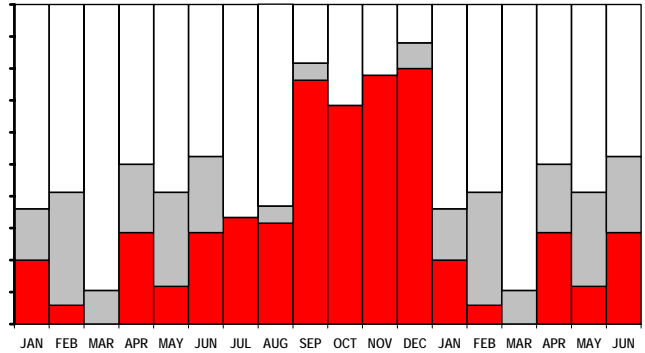
**Population** (226 records): 2% Abundant, 36% Common, 47% Frequent, 13% Rare, 2% Extinct.

**Dispersion** (206 records): 64% variable, 33% clumped, 3% widespread, 0.5% evenly distributed.

**Flowering** (227 records with: Jan 25, Feb 17, Mar 19, Apr 14, May 17, Jun 21, Jul 3, Aug 20, Sep 38, Oct 19, Nov 9, Dec 25): Buds from Jan 60 - Feb 41 - Mar 42 - Apr 86 - May 59 - Jun 76 - Aug 80 - Sep 13 - Oct 5 -; Flowering from May 18 - Aug 10 - Sep 55 - Oct 16 -; Peak Flowering from Jul 100 - Aug 5 - Sep 21 -; Over from Apr 7 - Jun 5 - Sep 5 - Oct 53 - Nov 44 - Dec 8 -; Fruit from Jan 28 - Feb 29 - Mar 58 - Apr 7 - May 6 - Aug 5 - Oct 26 - Nov 33 - Dec 56 -; Nothing from Jan 12 - Feb 29 - May 18 - Jun 19 - Sep 5 - Nov 22 - Dec 36. Peak levels at 95% in Sep. Historically recorded as flowering from Jul to Oct.



**Growth** (226 records with: Jan 25, Feb 17, Mar 19, Apr 14, May 17, Jun 21, Jul 3, Aug 19, Sep 38, Oct 19, Nov 9, Dec 25): Much from Jan 20 - Feb 6 - Apr 29 - May 12 - Jun 29 - Jul 33 - Aug 32 - Sep 76 - Oct 68 - Nov 78 - Dec 80 -; Rare from Jan 16 - Feb 35 - Mar 11 - Apr 21 - May 29 - Jun 24 - Aug 5 - Sep 5 - Dec 8 -; None from Jan 64 - Feb 59 - Mar 89 - Apr 50 - May 59 - Jun 48 - Jul 67 - Aug 63 - Sep 18 - Oct 32 - Nov 22 - Dec 12. Peak levels at 88% in Dec.



**Seedlings** (116 records): Absent in 98%: more seedlings than prefire adults in 1 case. Seedlings found in Jun.

**Fire Survival** (16 records): 88% survived by seedlings only, 6% eliminated from the area by fires, 6% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4 years, and 100% recorded at 7 years.



**Height** (227 records): 3% 0-0.2 m tall, 94% 0.2-1 m tall, 3% 1-2 m tall.

**Pollinators** (1 record): 100% beetles.

**Detailed Pollinators:** No additional data.

**Habitat:**

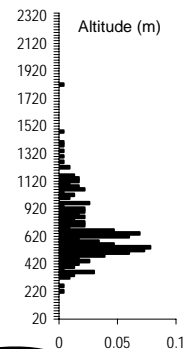
**Distance to Ocean** (227 records): 100% inland - further than 2 km from coast.

**Altitude** (227 records): 200 - 1720 m; 500 *lq* - 560 *med* - 660 *uq*m.

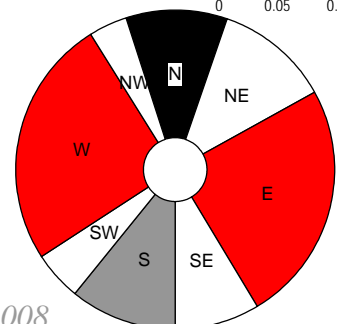
**Landform** (222 records): 72% deep soil, 25% shallow soil, 2% rocky outcrops.

**Slope** (222 records): 50% gentle incline, 31% steep incline, 12% platform, 4% hill top, 3% valley bottom.

**Aspect** (202 records): 36% East, 31% West, 17% North, 17% South.



**Soil Type** (221 records): 58% sandy, 19% gravelly, 12% loamy, 8% rocky, 3% clayey.  
**Soil Colour** (218 records):



47% grey, 28% brown, 12% white,  
6% orange, 2% black, 2% red, 1% yellow.

**Geology** (222 records): 80% sandstone,  
13% shale, 5% silcrete or ferricrete,  
2% granite.

**Vegetation** (223 records): 98% shrubland,  
2% plantations.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 977 km<sup>2</sup> with 34%  
conserved and 21% lost; Occupancy:  
186 km<sup>2</sup> with 52% conserved and 9% lost.  
Fragmentation index: 17%.

**Nature Reserves** (227 records): 71% in nature  
reserves - well conserved.

**Habitat destruction** (222 records):  
95% extensive natural habitat, 2% islands,  
1% naturally linear habitats.

**Alien Invasive Species** (222 records):

37% *Pinus*, 33% *Hakea*, 17% none,  
13% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (222 records): 17% alien-free,  
69% sparse, 11% abundant, 2% dense.

**Cultivation & Utilization:**

**Picking** (158 records): 100% no sign of  
picking.

**Cultivation Status:** Plantings - 5 records (2%).

**Atlassers Notes:**

Heavy collecting of seedheads by rodents - lots  
of piles of seedheads at holes  
(AGRY4031007);

About 50% mortality in dense patches  
(AGR92051704); quite a few others looked  
stressed (LYM97010403); Tough year - half  
plants with dead branches (AGR95052301);  
Some plants had died and

Hundreds of dead - no young or regeneration  
seen! (AGR96020319); Lots of skeletons -  
no young! (AGR96020320);

One dead-skeleton seen (AGRY1022008);  
Skeleton only seen on shale band  
(ASP92112606);

**Confusing Species:** None noted.

Records of identification queries = 4.

**Variation and Taxonomy:** Involucral bract  
colour varies from dark claret to clear red to  
dirty to washed-out red and occasionally  
even pale green.

**Distribution:** Add.

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*Protea pityphylla* Phill. 1910  
**Ceres Sugarbush**  
*Skaamblom*

**Other Common Names:** Long-leaf Mountainrose, Mountain-rose Sugarbush, Pine-leaf Mountainrose, *Bergroos*, *Grootskaamroos*.

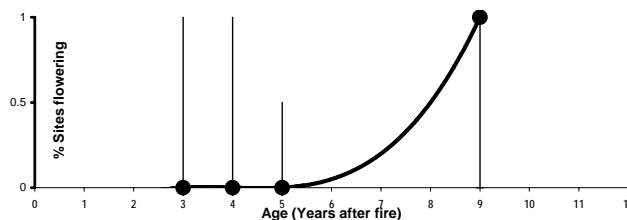
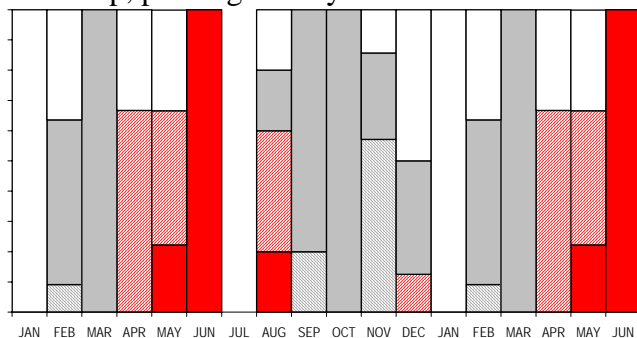
**Other Scientific Names:** *None*.

**54 Records**

**Population** (53 records): 23% Common, 62% Frequent, 15% Rare.

**Dispersion** (51 records): 51% clumped, 49% variable.

**Flowering** (53 records with: Jan 2, Feb 11, Mar 1, Apr 3, May 9, Jun 1, Jul 0, Aug 5, Sep 5, Oct 1, Nov 7, Dec 8): Buds from Apr to May and Aug; Flowering from May to Aug; Peak Flowering not recorded; Over from Sep to Nov; Fruit from Aug to Mar; Nothing from Dec to May. Peak levels unreliable in Jun. Historically recorded as flowering from May to Sep, peaking in May to Jul.



**Height** (54 records): 20% 0-0.2 m tall, 78% 0.2-1 m tall, 2% 1-2 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

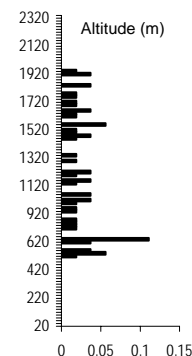
**Distance to Ocean** (53 records): 100% inland - further than 2 km from coast.

**Altitude** (53 records): 500 - 1840 m; 620 *lq* - 920 *med* - 1240 *uq*m.

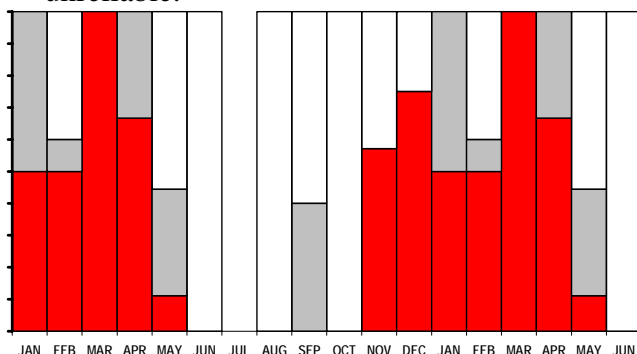
**Landform** (50 records): 58% deep soil, 38% shallow soil, 4% swamp.

**Slope** (50 records): 46% steep incline, 36% gentle incline, 12% platform, 4% hill top, 2% valley bottom.

**Aspect** (42 records): 40% North, 33% East, 24% West, 2% South.



**Growth** (52 records with: Jan 2, Feb 10, Mar 1, Apr 3, May 9, Jun 1, Jul 0, Aug 5, Sep 5, Oct 1, Nov 7, Dec 8): Much from Nov to Apr; Rare from Jan, Apr to May and Sep; None from Feb and May to Dec. Peak levels unreliable.



**Soil Type** (50 records):

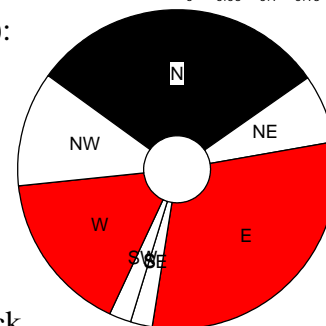
62% sandy, 14% rocky, 12% gravelly, 8% loamy, 4% clayey.

**Soil Colour** (50 records):

54% grey, 26% brown, 12% white, 6% orange, 2% black.

**Geology** (49 records): 86% sandstone, 14% shale.

**Vegetation** (49 records): 100% shrubland.



**Seedlings** (23 records): All without any seedlings present.

**Fire Survival** (3 records): 67% eliminated from the area by fires, 33% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 9 years, 50% estimated at 7-8 years, and 100% recorded at 9 years.

**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened D2(i).

Occurrence (Fynbos): 598 km<sup>2</sup> with 45% conserved and 13% lost; Occupancy: 66 km<sup>2</sup> with 55% conserved and 3% lost.

Fragmentation index: 8%.

**Nature Reserves** (53 records): 70% in nature reserves - well conserved.

**Habitat destruction** (49 records):

88% extensive natural habitat, 8% islands, 4% naturally linear habitats.

**Alien Invasive Species** (49 records): 45% none, 37% *Pinus*, 18% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (49 records): 45% alien-free, 43% sparse, 8% abundant, 4% dense.

**Cultivation & Utilization:**

**Picking** (29 records): 100% no sign of picking.  
**Cultivation Status:** Plantings - 1 record (2%).

**Atlassers Notes:**

Plants form mats at this locality

(SHR93081505);

11 plants (AGRY0081704);

Very much stressed (WMP99032101);

**Confusing Species:** Easily and regularly confused with *P. witzenbergiana*, but has much larger flowerheads and bright green leaves. Forms co-occurring with *P. nana*

often have much shorter (but bright green) leaves.

Records of identification queries = 18.

Records of corrected identification queries = 16.

**Variation and Taxonomy:** No variation noted, although some forms appear to be prostrate rather than sprawling.

**Distribution:** Add.

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*Protea witzenbergiana* Phill. 1910  
Swan Sugarbush

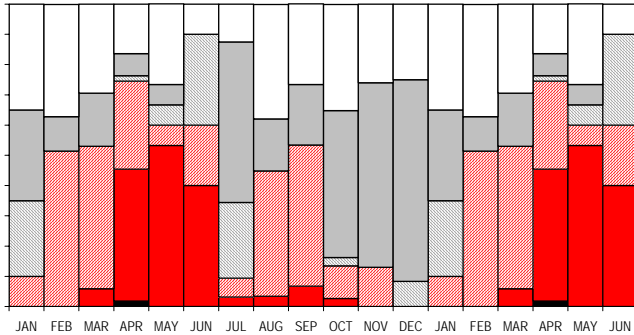
**Other Common Names:** Crested Mountainrose, Witzenberg Sugarbush, *Maanhaarbergroos*, *Skaamrosie*.  
**Other Scientific Names:** *None*.

**361 Records**

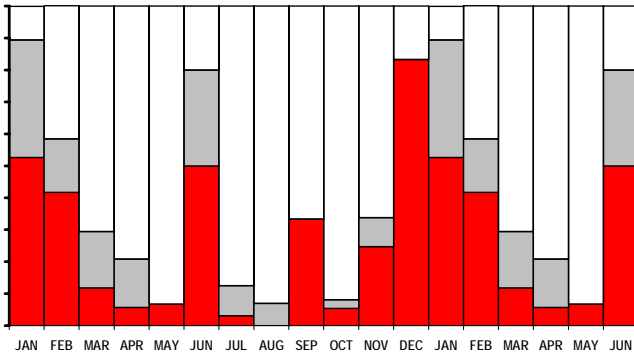
**Population** (357 records): 15% Common, 54% Frequent, 31% Rare.

**Dispersion** (298 records): 66% variable, 31% clumped, 2% widespread.

**Flowering** (354 records with: Jan 20, Feb 35, Mar 17, Apr 55, May 15, Jun 10, Jul 32, Aug 29, Sep 15, Oct 37, Nov 77, Dec 12): Buds from Feb to Apr and Aug to Sep; Flowering from Apr to Jun; Peak Flowering not significant; Over from Jan and Jun to Jul; Fruit from Sep to Jan and Jul; Nothing from Aug to Jan to Mar and May. Peak levels at 90% in Jun. Historically recorded as flowering from Mar to June, peaking from Apr to May, earlier at lower altitudes and later at higher.



**Growth** (352 records with: Jan 19, Feb 36, Mar 17, Apr 53, May 15, Jun 10, Jul 32, Aug 29, Sep 15, Oct 37, Nov 77, Dec 12): Much from Nov to Feb, Jun and Sep; Rare from Jan and Jun; None from Feb to Dec. Peak levels at 89% in Jan.



**Seedlings** (140 records): Absent in 93%; fewer seedlings than prefire adults in 4 cases, and more in 1 case. Seedlings found in Jan, Mar (2), Jul and Sep.

**Fire Survival** (16 records): 44% resprouted from underground boles, 31% survived by seedlings only, 19% escaped fires in fire-safe areas, 6% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 3-4 years, and 100% consistently recorded after 11 years.



**Height** (354 records): 39% 0-0.2 m tall, 61% 0.2-1 m tall.

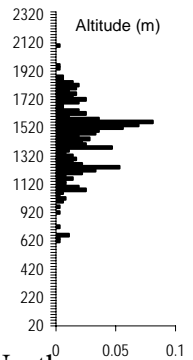
**Pollinators** (5 records): 40% birds, 40% mammals, 20% bees or wasps.

**Detailed Pollinators** (3 records): Orange-breasted Sunbird (2), Honey Bee.

**Habitat:**

**Distance to Ocean** (360 records): 100% inland - further than 2 km from coast.

**Altitude** (360 records): 600 - 2000 m; 1140 *lq* - 1380 *med* - 1460 *uq*m.



**Landform** (356 records): 66% deep soil, 30% shallow soil, 3% rocky outcrops.

**Slope** (357 records): 53% gentle incline, 22% steep incline, 12% hill top, 11% platform, 1% valley bottom.

**Aspect** (291 records): 31% East, 30% North, 25% South, 15% West.

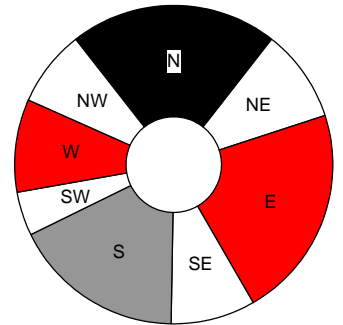
**Soil Type** (357 records):

48% sandy, 21% gravelly, 17% loamy, 10% rocky, 5% clayey.

**Soil Colour** (356 records): 46% brown, 35% grey, 9% white, 6% yellow, 3% orange, 1% red.

**Geology** (346 records): 76% sandstone, 24% shale.

**Vegetation** (357 records): 100% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 3 857 km<sup>2</sup> with 11% conserved and 8% lost; **Occupancy:** 435 km<sup>2</sup> with 21% conserved and 2% lost. **Fragmentation index:** 9%.

**Nature Reserves** (360 records): 28% in nature reserves.

**Habitat destruction** (354 records): 94% extensive natural habitat, 3% islands, 3% naturally linear habitats.

**Alien Invasive Species** (343 records): 80% none, 19% *Pinus*.

**Alien Density** (343 records): 80% alien-free, 18% sparse, 1% abundant.

**Cultivation & Utilization:**

**Picking** (228 records): 100% no sign of picking, 0.4% severely picked.

**Cultivation Status:** No noted cultivation.

**Atlasers Notes:****Habit**

Taller form more upright (AGRY0112305);

A very big mat (AWA96082505);

1/2 plant burnt, leaves short (WMP95010116);

**Pollination**

Lots of flowers eaten out by mice - tracks and nibbles of mice visible on flowerheads (AGRY0042901);

**Post-fire seed release**

Dead plants (after burning) roll inwards and lift seed cones up into the air! (AGRY4110703);

Burned plants erect (must curl in and up as live plants are prostrate) so that seed heads are almost 0.5m tall (AGRY4110707);

<INSERT ILLUSTRATION OF DEAD PLANTS.>

**Picking**

Severely denuded of heads somewhere: this plot contained 2 disintegrated socks of tight-packed flowerheads (much more than this plot would provide) (SMR99120905);

**Habitat**

On rocks at edge of wetland (AKS94110705);

**Stress**

One very stressed plant - dry reddish leaves and aborted buds (SMRY1021403);

**Confusing Species:** Although easily confused with *P. pityphylla*, in almost all cases the it was longer-leaved *witzenbergiana* that where misidentified as *P. pityphylla*. Surprisingly, it was confused with *P. nana*, which is an erect plant, but then erect forms of this species were noted by atlasers. The sparsely pubescent (especially when young), blue-grey leaves ( which may be flushed with carmine under stress) and long tips to the outer involucre bracts are diagnostic.

Records of identification queries = 19.

Records of corrected identification queries = 8.

**Variation and Taxonomy:** At higher altitudes a dense prostrate growth habit, with plants seldom taller than 200mm, is found. At lower altitudes a diffuse growth habit with occasional erect stems up to 0.5m tall may occur.

Leaf length also varies, in cold habitats leaves may be as short as 15mm, whereas they may average 55mm at the lowest altitudes, but typically leaves are 25-30mm long.

**Distribution:** Add.

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*Protea mucronifolia* Salisb. 1805

**Dagger-leaf Sugarbush**

*Kasteelkloofsuikerbos*

**Other Common Names:** Dagger-leaf Erodendrum.

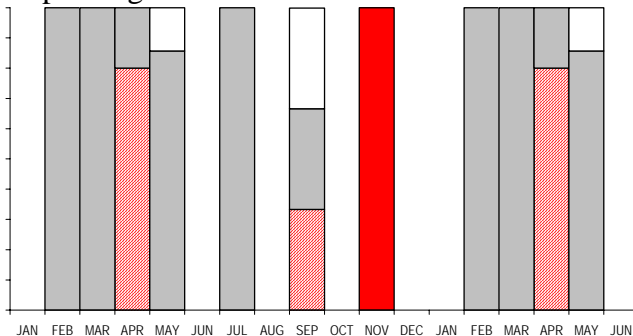
**Other Scientific Names:** *mucronata* Hort ex Meisn 1856, *odoratissima* Masson ex Meisn 1856.

**26 Records**

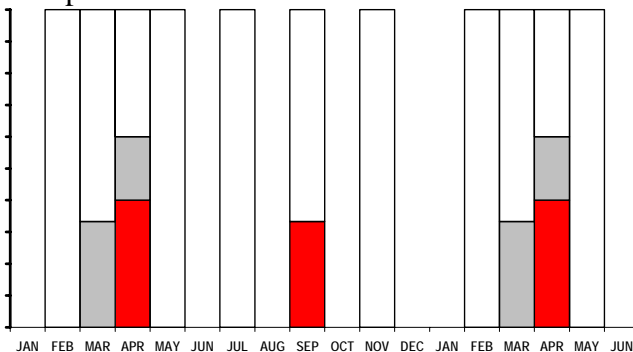
**Population** (26 records): 54% Common, 27% Frequent, 19% Rare.

**Dispersion** (24 records): 67% variable, 33% clumped.

**Flowering** (26 records with: Jan 0, Feb 1, Mar 3, Apr 10, May 7, Jun 0, Jul 1, Aug 0, Sep 3, Oct 0, Nov 1, Dec 0): Buds from Apr and Sep; Flowering from Nov; Peak Flowering and Over not recorded; Fruit from Feb to Sep; Nothing from Sep. Peak levels unreliable at 100% in Nov. Historically recorded as flowering from Oct to Jan, peaking in Nov to Dec.



**Growth** (26 records with: Jan 0, Feb 1, Mar 3, Apr 10, May 7, Jun 0, Jul 1, Aug 0, Sep 3, Oct 0, Nov 1, Dec 0): Much from Apr and Sep; Rare from Mar to Apr; None from all year round. Peak levels unreliable at 60% in Apr.



**Seedlings** (10 records): All without any seedlings present.

**Fire Survival** : No data.

**Age to first flowering:** A single record of flowering at 9 years.

**Height** (26 records): 100% 0.2-1 m tall.

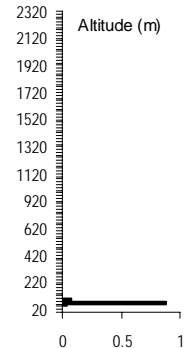
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (26 records): 100% inland - further than 2 km from coast.

**Altitude** (26 records): 40 - 100 m; 60<sub>lq</sub> - 80<sub>med</sub> - 80<sub>uq</sub>m.



**Landform** (26 records): 100% deep soil.

**Slope** (26 records): 88% platform, 8% valley bottom, 4% gentle incline.

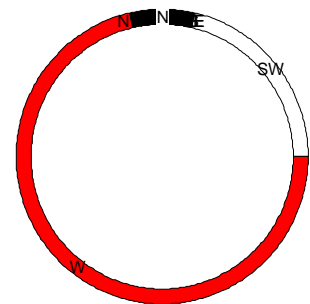
**Aspect** (14 records): 89% West, 7% North, 4% South.

**Soil Type** (26 records): 31% sandy, 31% loamy, 27% clayey, 12% gravelly.

**Soil Colour** (26 records): 69% brown, 27% orange, 4% yellow.

**Geology** (26 records): 96% shale, 4% Tertiary sands.

**Vegetation** (26 records): 100% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Critically Endangered

B1a(i)b(i,ii,iii,iv,v)c(iv)+

2a(i)b(i,ii,iii,iv,v)c(iv).

**Occurrence** (Fynbos): 10 km<sup>2</sup> with 35% conserved and 63% lost; **Occupancy:** 17 km<sup>2</sup> with 60% conserved and 39% lost.

**Fragmentation index:** 37%.

**Nature Reserves** (26 records): 96% in nature reserves - well conserved.

**Habitat destruction** (26 records): 96% extensive natural habitat, 4% islands.

**Alien Invasive Species** (26 records): 88% none, 8% Myrtaceae, 4% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (26 records): 88% alien-free, 8% sparse, 4% abundant.

**Cultivation & Utilization:**

**Picking** (22 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

Grazed (AGR96042711, 13-14);

100s of plants (WIJ96042708);

New locality: in one small patch of wind-eroded shale on ne side of dune covered hill - about 20 plants seen (AGRY0072718);

**Confusing Species:** None noted.

**Variation and Taxonomy:** None recorded.

**Distribution:** Add.

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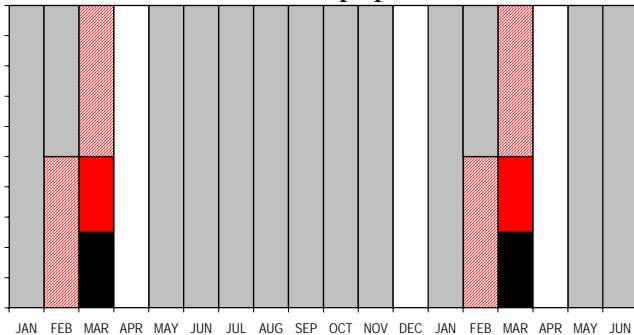
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***Protea odorata* Thunb. 1781**  
**Swartland Sugarbush**  
*Swartlandsuikerbos*

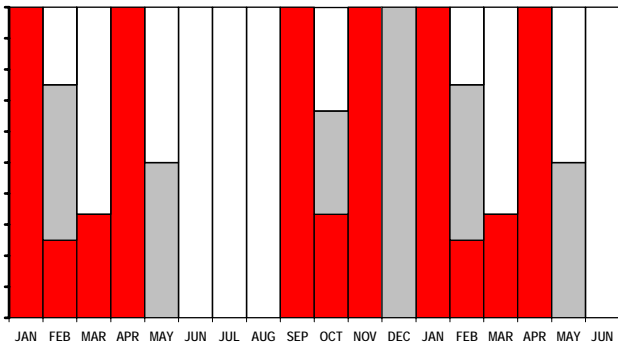
**Other Common Names:** Dewdrop Protea, Scented Protea.  
**Other Scientific Names:** *odoratissima* Masson ex Meisn 1856.

**33 Records**

**Population** (33 records): 0% Common, 42% Frequent, 30% Rare, 27% Extinct.  
**Dispersion** (19 records): 100% clumped.  
**Flowering** (24 records with: Jan 1, Feb 4, Mar 4, Apr 1, May 2, Jun 4, Jul 1, Aug 1, Sep 1, Oct 3, Nov 1, Dec 1): Buds from Feb to Mar; Flowering from Mar; Peak Flowering from Mar; Over not recorded; Fruit from Jan to Feb and May to Nov; Nothing from Apr and Dec. Peak levels unreliable at 100% in Mar. Historically recorded as flowering from Feb to Jun, with a Mar to Apr peak.



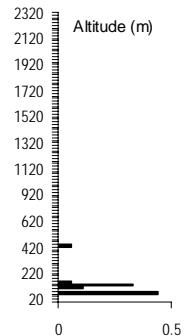
**Growth** (23 records with: Jan 1, Feb 4, Mar 3, Apr 1, May 2, Jun 4, Jul 1, Aug 1, Sep 1, Oct 3, Nov 1, Dec 1): Much from Jan to Apr and Sep to Nov; Rare from Feb, May, Oct and Dec; None from Feb to Oct. Peak levels unreliable at 100% in Nov to Jan.



**Seedlings** (10 records): All without any seedlings present.  
**Fire Survival** (1 record): 100% eliminated from the area by fires.  
**Age to first flowering:** A single record of flowering at 11 years. Flowered at 3 years regenerating from seeds after bushcutting.

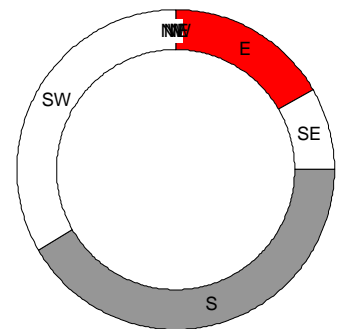
**Height** (24 records): 21% 0-0.2 m tall, 79% 0.2-1 m tall.  
**Pollinators:** No data.  
**Detailed Pollinators:** No additional data.

**Habitat:**  
**Distance to Ocean** (18 records): 100% inland - further than 2 km from coast.  
**Altitude** (18 records): 60 - 440 m; 60<sub>lq</sub> - 80<sub>med</sub> - 80<sub>uq</sub> m.



**Landform** (17 records): 88% deep soil, 12% shallow soil.  
**Slope** (17 records): 53% platform, 47% gentle incline.  
**Aspect** (12 records): 58% South, 21% East, 21% West.

**Soil Type** (16 records): 63% clayey, 25% sandy, 13% loamy.  
**Soil Colour** (16 records): 56% grey, 44% brown.  
**Geology** (16 records): 75% shale, 19% sandstone, 6% granite.  
**Vegetation** (17 records): 94% shrubland, 6% agricultural lands.



**Conservation Status and Threat:**  
**Red Data List Status:** Critically Endangered A2c, B1b(i,ii,iii,v)c(iv)+2b(i,ii,iii,v)c(iv), C1+2a(i,ii), D  
**Occurrence** (Fynbos): 50 km<sup>2</sup> with 10% conserved and 62% lost; Occupancy: 9 km<sup>2</sup> with 33% conserved and 15% lost. Fragmentation index: 9%.

**Nature Reserves** (18 records): 6% in nature reserves - inadequately conserved.  
**Habitat destruction** (17 records): 47% extensive natural habitat, 41% islands, 6% road verges, 6% naturally fragmented habitats.  
**Alien Invasive Species** (17 records): 76% Fabaceae (chiefly alien *Acacia*), 24% *Pinus*.  
**Alien Density** (17 records): 53% sparse, 12% abundant, 29% dense, 6% impenetrable.

**Cultivation & Utilization:**  
**Picking** (19 records): 100% no sign of picking.  
**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**  
**Groenrivier (near Riverlands) population**  
 Known locality - not found (MTA92082701)); All plants dead - metal tags of marked plants found but no recruitment! (APE93060502); All killed with no seedlings (ASP94072109); This colony was marked out for protection - a fence put around to keep out animals - all plants were marked - All gone not a trace (GYC95100403);

Small seedling: 2 poles South 1 pole East of SANF (WWF-SA) enclosure (AGR96042601);  
No plants seen : only aluminium clips (tags) from 1985 population census - nothing there now! Like other sites - saline clay with 'dunes' of sand (AGR96042602);  
Surveyed plot no1 no plants found (DJL99112401);

#### **Joostenberg Hill population**

Only 3 plants are present at this site the other 4 reported previously are all gone - 1 due to bushcutting (CHT96032201);  
(Note: originally conflicting reports of 4 and 3 surviving plants were recorded. These turned out to be two stands, dubbed "Atlasser" and "BotSoc" plants, respectively.)

#### **BotSoc patch**

2 dead plants found : no young (AGR96042605);  
Two plants had been killed, one plant had been flattened but was still alive (NGF96080901);  
The one broken plant found and atlassed (number 4 of NGF96080901) could not be found this time (LYM97051001);  
Three plants in old quarry in renosterbos (CHE97061201);  
Of the 3 original plants 2 had buds. One of these plants has been partially hidden by a fallen renosterbos which had damaged the stem (LYM99020601);  
One plant had one flower with lots of buds (NGF99022001);  
Two other old plants were found near the pine tree/fence/road. I could not find the 3rd one: altogether there are 24 plants (NGF99010901);  
The 3 BotSoc plants are now 2 - the plant that was 500mm high has died. The plant that was knocked down by a Renosterbos plant has survived and is in cone and has new growth (NGF99100901);  
The two adult plants under the pine tree are ok. The one knocked over by the renosterbos still clings to life and is in cone, the other one has many flowers and buds (NGFY0031101);  
Could not find (save 1 skeleton) any of three original McDowell plants by pine at fence (AGRY0092801);

#### **Atlas patch**

Patch Ploughed up! Seed from two dead plants was collected and is to be taken to Kirstenbosch (NGF96080901);  
*Protea odorata* recovers! After 3 plants were bush cut in 1996, 22 young plants have popped up and all look very happy. (NGF99010901);  
24 young plants counted some of the new growth on these plants had died back (LYM99020601);  
The stem has been damaged and the plant is not in bud but last years cones still retain seed (NGF99022001);  
I counted 25 young plants (plus 2 BotSoc plants making 27 altogether). One young plant flowered in March 1999 and is now in cone (NGF99100901);  
Plants in a row parallel to trend of bushcut (SHRY0020605);  
The young plants discovered in January 1999 are all very happy and are all in bud except for one plant which was flowering (NGFY0031101);  
27 plants counted (AGRY0092801);  
Only 24 plants left - those are heavily grazed (AMMY2112501);  
22 plants counted. Has recovered well since it was first noted in approximately Nov 2002 that the plants were being eaten by cattle. Has been fenced in but there are 4 plants outside this fence - 2 of them looked doomed because they are right next to the fence where people walk to look at the fenced in plants (NGFY4031001);

**Confusing Species:** None noted.

**Variation and Taxonomy:** The Joostenberg form as far more robust than the Riverlands form in the field, but this has not been noted in the taxonomic accounts.

**Distribution:** Add.

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*Protea effusa* Meyer ex Meisn. 1856  
Scarlet Sugarbush

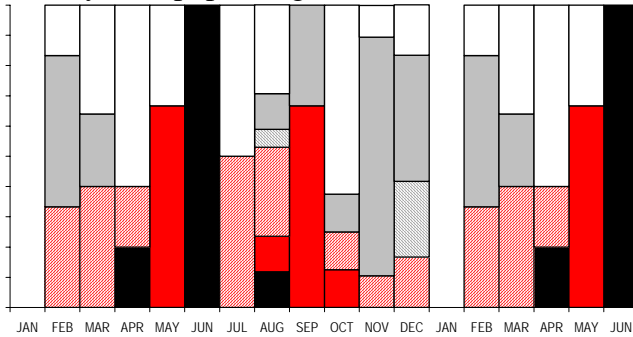
**Other Common Names:** Marloth's Sugarbush.  
**Other Scientific Names:** *marlothii* Phill 1910.

**111 Records**

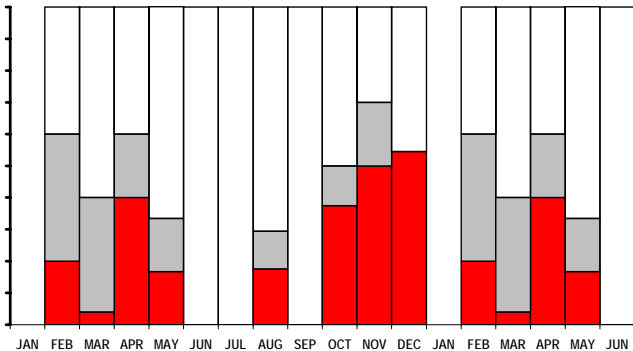
**Population** (111 records): 14% Common, 39% Frequent, 45% Rare, 3% Extinct.

**Dispersion** (86 records): 52% variable, 41% clumped, 3% evenly distributed, 3% widespread.

**Flowering** (104 records with: Jan 0, Feb 6, Mar 25, Apr 5, May 6, Jun 1, Jul 2, Aug 17, Sep 3, Oct 8, Nov 19, Dec 12): Buds from Feb to Apr and Jul to Aug; Flowering from May and Sep; Peak Flowering from Apr and Jun; Over from Dec; Fruit from Feb to Mar, Sep and Nov to Dec; Nothing from Mar to Aug and Oct. Peak levels unreliable at 100% in Jun. Historically recorded as flowering from May to Sep, peaking from Jun to Jul.



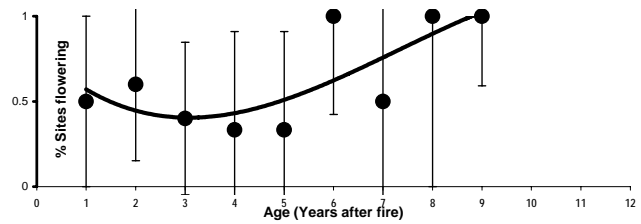
**Growth** (103 records with: Jan 0, Feb 5, Mar 25, Apr 5, May 6, Jun 1, Jul 2, Aug 17, Sep 3, Oct 8, Nov 20, Dec 11): Much from Oct to Feb and Apr; Rare from Feb to Apr and Nov; None from all year round. Peak levels at 70% in Nov.



**Seedlings** (31 records): Absent in 61%: fewer seedlings than prefire adults in 2 cases, and more in 4 cases. Seedlings found in Mar, Apr, Aug (3) and Oct.

**Fire Survival** (26 records): 42% escaped fires in fire-safe areas, 35% resprouted from underground boles, 12% eliminated from the area by fires, 12% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4-5 years, and 100% recorded consistently at 8 years.



**Height** (107 records): 50% 0-0.2 m tall, 50% 0.2-1 m tall.

**Pollinators** (1 record): 100% mammals.  
**Detailed Pollinators:** No additional data.

**Habitat:**

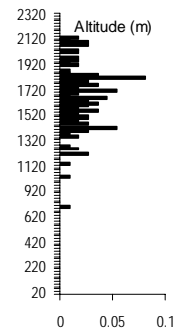
**Distance to Ocean** (111 records): 100% inland - further than 2 km from coast.

**Altitude** (111 records): 680 - 2040 m; 1380 *lq* - 1560 *med* - 1700 *uq*m.

**Landform** (110 records): 65% shallow soil, 33% deep soil, 3% rocky outcrops.

**Slope** (111 records): 65% steep incline, 27% gentle incline, 6% hill top, 2% cliff.

**Aspect** (103 records): 30% North, 27% South, 24% West, 19% East.

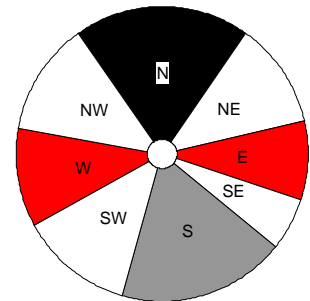


**Soil Type** (111 records): 42% sandy, 24% rocky, 16% gravelly, 15% loamy.

**Soil Colour** (108 records): 55% grey, 37% brown, 4% black, 4% white.

**Geology** (108 records): 92% sandstone, 8% shale.

**Vegetation** (109 records): 99% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened A4c.  
**Occurrence** (Fynbos): 3 614 km<sup>2</sup> with 17% conserved and 17% lost; **Occupancy:** 157 km<sup>2</sup> with 58% conserved and 0% lost. **Fragmentation index:** 3%.

**Nature Reserves** (111 records): 55% in nature reserves - well conserved.

**Habitat destruction** (109 records): 97% extensive natural habitat, 2% patches.

**Alien Invasive Species** (107 records): 82% none, 13% *Pinus*, 5% *Hakea*.

**Alien Density** (107 records): 82% alien-free, 18% sparse.

**Cultivation & Utilization:**

**Picking** (51 records): 98% no sign of picking, 2% lightly picked.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (0.9%).



**Atlassers Notes:****Size**

At least 1m across- 5 flowers (TLE98062810);  
3m in diameter (WIJY0082704);

**Mortality**

Lots (30%) of dead plants (AGRY0112609); 1  
dead plant seen (WIJ98080117); Many dead  
(unburnt) plants (WIJY0082704);

**Fire survival**

Quite of lot of plants escaped in rocky areas and  
in sparser veld (AGRY1032310);  
Only two plants survived the fire by burning on  
the edges and recovering from inside. No  
seedlings seen in over 100 dead plants -  
prefire densities would have been common  
clumped (AGRY0112509);

**Pollination**

Numerous ants seen all over head  
(WEL94080701);

**Confusing Species:** Especially on  
Matroosberg, easily confused with *P.*  
*sulphurea*, which usually has much smaller  
leaves. A non-flowering plant was confused  
with *L. arcuatum*.

Records of identification queries = 29.

Records of corrected identification queries = 9.

**Variation and Taxonomy:** Both growth habit  
and leaf dimensions vary considerably  
between populations.

- Northern populations (near Ceres) are upright, rounded shrubs to 1.5m tall, with broad leaves to 25mm wide. Flowerheads are erect to pendant. Some atlassers have suggested that many of these plants are hybrids as the broader-leaved more erect plants are always associated with *P. recondita*. Prostrate forms are apparently the rule even here when *P. recondita* is not present.
- Western populations are diffuse sprawling shrubs, rarely reaching 0.5m tall, with trailing stems. Leaves are narrower 10-15mm wide.
- Langeberg populations are prostrate plants forming dense mats 200mm tall, but 3m in diam., with flowerheads facing skywards on the perimeter.

The majority of populations have deep red bracts, variants with green to greenish-yellow bracts suffused with dull red occur.

**Distribution:** Add.

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*Protea namaquana* Rourke 1990  
Kamiesberg Sugarbush

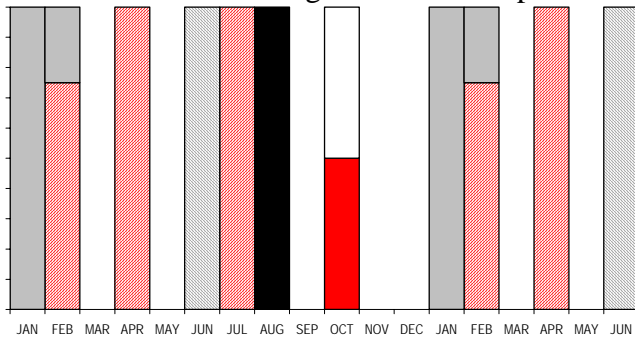
**Other Common Names:** *Skaamblom*.  
**Other Scientific Names:** *None*.

**20 Records**

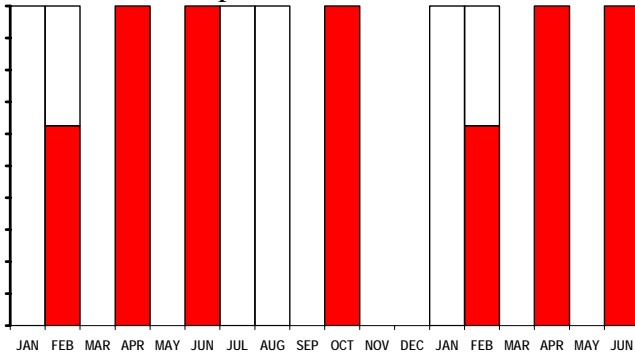
**Population** (19 records): 16% Common, 53% Frequent, 26% Rare, 5% Extinct.

**Dispersion** (18 records): 61% variable, 33% clumped, 6% evenly distributed.

**Flowering** (19 records with: Jan 4, Feb 8, Mar 0, Apr 1, May 0, Jun 2, Jul 1, Aug 1, Sep 0, Oct 2, Nov 0, Dec 0): Buds from Feb to Apr and Jul; Flowering from Oct; Peak Flowering from Aug; Over from Jun; Fruit from Jan and Feb; Nothing from Oct. Peak levels unreliable at 100% in Aug. Historically recorded as flowering from Jun to Sep.



**Growth** (19 records with: Jan 4, Feb 8, Mar 0, Apr 1, May 0, Jun 2, Jul 1, Aug 1, Sep 0, Oct 2, Nov 0, Dec 0): Much from Feb to Jun and Oct; Rare not recorded; None from Jan to Feb and Jul to Aug. Peak levels unreliable at 100% from Apr to Jun.



**Seedlings** (14 records): All without any seedlings present.

**Fire Survival** (2 records): 100% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 11 years and 100% recorded at 11 years.



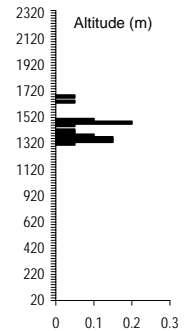
**Height** (20 records): 30% 0.2-1 m tall, 70% 1-2 m tall.

**Pollinators** (1 record): 100% bees or wasps.  
**Detailed Pollinators** (1 record): Honey Bee.

**Habitat:**

**Distance to Ocean** (20 records): 100% inland - further than 2 km from coast.

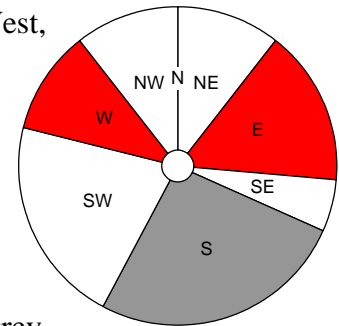
**Altitude** (20 records): 1200 - 1580 m; 1240<sub>lq</sub> - 1280<sub>med</sub> - 1320<sub>uq</sub>m.



**Landform** (20 records): 60% deep soil, 40% shallow soil.

**Slope** (20 records): 60% steep incline, 35% gentle incline, 5% platform.

**Aspect** (19 records): 34% South, 29% West, 24% East, 13% North.



**Soil Type** (20 records): 75% loamy, 25% sandy.

**Soil Colour** (19 records): 63% brown, 26% orange, 11% grey.

**Geology** (20 records): 95% granite, 5% shale.

**Vegetation** (20 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Critically Endangered B1a(i)b(v)c(iv)+2a(i)b(v)c(iv).

**Occurrence** (Fynbos): 18 km<sup>2</sup> with 0% conserved and 0% lost; **Occupancy:** 24 km<sup>2</sup> with 0% conserved and 0% lost. **Fragmentation index:** 69%.

**Nature Reserves** (20 records): 0% in nature reserves - unconserved.

**Habitat destruction** (20 records): 95% extensive natural habitat, 5% naturally fragmented habitats.

**Alien Invasive Species** (20 records): 100% none.

**Alien Density** (20 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (20 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 6 records (30%).

**Atlassers Notes:**

**Size**

The one plant was enormous with many, many cones (200?). The trunk was approximately 100mm in diameter (NGF98020107); Trunks were 60-80mm diameter (WIJ92071703);

**Fire survival**

Skeletons at last fire to current = 1:1 (AGR98020109); 2 plants were young growing alongside the larger bush (LYM98020101);

A burnt pop was found at about 1400m on NW slopes of Rooiberg but no seedlings or young plants - 6yrs since fire - No young plants were found in the surveyed populations - I suggest that seed be collected and given to Rod Saunders at Kirstenbosch - he is very keen (NAH92040601);

About 50 adult plants all killed by last fire and only 15 young plants noted - mostly along stream (NAHY4101401);

All 4 bushes were burnt & dead - but the protea flowerheads were open and still on the bushes - no young plants found (WIJ92071703);

#### **Mortality**

Those in swamp hit hardest about 50% dead - 50 live (AGR98013130); This was the only live plant seen on the Rooiberg (WIJ92071708);

#### **Population sizes**

About 120 plants! (AGR98013112); About 30 plants (AGR98013131); 13 plants (WMP98020104);

Appears to be highly endangered the only population I found consisted of about 35 healthy adults.. South slopes of Rooiberg

were scanned with binoculars and no pops were visible (NAH92040601);

#### **Witches Broom**

Every single plant that was looked at had Witches Broom. Some dead plants (30) were probably killed by it (NGF98020103); Most of adult plants infected (NAHY4101401); At least 75% of this population had Witches Broom on it (WELY0061612-13);

#### **Distribution**

Proteas do not grow together with *Vexatorella* (WMP98020104);

**Confusing Species:** None in the area.  
Records of identification queries = 1.

**Variation and Taxonomy:** None noted.

**Distribution:** Add.

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*Protea pendula* R.Br. 1810  
**Nodding Sugarbush**  
*Knikkopsuikerbos*

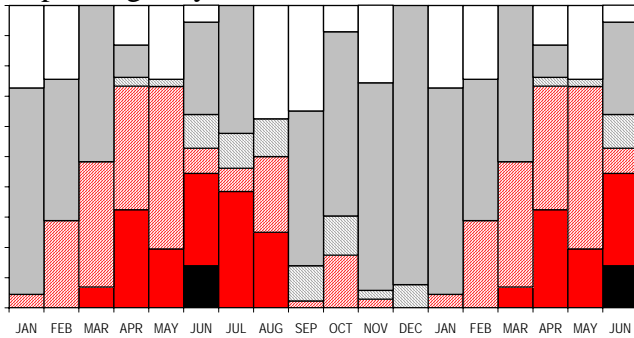
**Other Common Names:** Arid Sugarbush, Mini-rosette, *Ondersteboknopprotea*, *Skaamblom*, *Skaamrosie*.  
**Other Scientific Names:** *None*.

**546 Records**

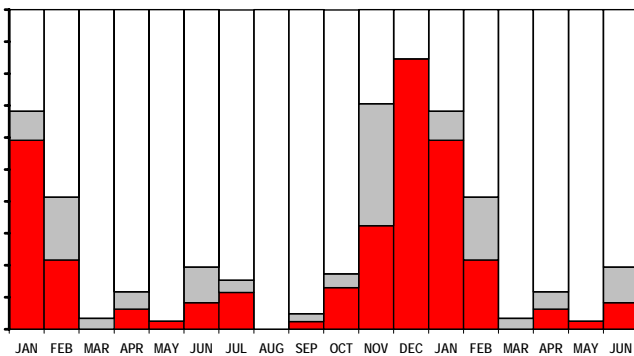
**Population** (542 records): 27% Common, 46% Frequent, 25% Rare, 2% Extinct.

**Dispersion** (464 records): 73% variable, 25% clumped, 1% widespread.

**Flowering** (527 records with: Jan 22, Feb 45, Mar 29, Apr 206, May 41, Jun 36, Jul 26, Aug 8, Sep 43, Oct 23, Nov 35, Dec 13): Buds from Feb to May and Aug; Flowering from Apr to Aug; Peak Flowering not significant in Jun; Over not significant; Fruit from Sep to Mar and Jun to Jul; Nothing from Jan to Feb, May, Aug to Sep and Nov. Peak levels at 76% in Apr. Historically recorded as flowering from May to Aug, peaking May to Jun.



**Growth** (524 records with: Jan 22, Feb 46, Mar 29, Apr 205, May 40, Jun 36, Jul 26, Aug 8, Sep 42, Oct 23, Nov 34, Dec 13): Much from Nov to Feb; Rare from Feb and Nov; None from Jan to Nov. Peak levels at 85% in Dec.



**Seedlings** (179 records): Absent in 99%; more seedlings than prefire adults in 1 case. Seedlings found in Jun.

**Fire Survival** (29 records): 41% eliminated from the area by fires, 41% escaped fires in fire-safe areas, 14% survived by seedlings only, 3% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 4-6 years, and 100% recorded consistently at 12 years.



**Height** (529 records): 2% 0-0.2 m tall, 65% 0.2-1 m tall, 32% 1-2 m tall.

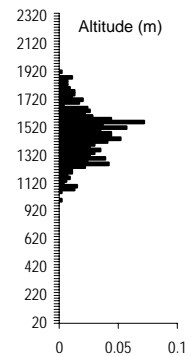
**Pollinators** (19 records): 74% birds, 21% bees or wasps, 5% mammals.

**Detailed Pollinators** (18 records): Orange-breasted Sunbird (13), Honey Bee (4), Southern Double-collared Sunbird.

**Habitat:**

**Distance to Ocean** (542 records): 100% inland - further than 2 km from coast.

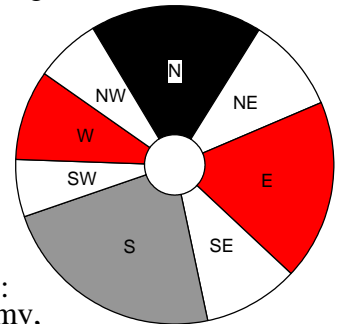
**Altitude** (542 records): 880 - 1820 m; 1220 *lq* - 1360 *med* - 1460 *uq*m.



**Landform** (537 records): 55% deep soil, 41% shallow soil, 3% rocky outcrops.

**Slope** (536 records): 58% gentle incline, 24% steep incline, 11% hill top, 6% platform, 1% cliff.

**Aspect** (476 records): 31% South, 29% East, 25% North, 15% West.



**Soil Type** (536 records): 35% sandy, 28% loamy, 17% gravelly, 16% rocky, 4% clayey.

**Soil Colour** (534 records): 42% brown, 33% grey, 10% yellow, 9% orange, 4% white, 3% red.

**Geology** (509 records): 71% sandstone, 28% shale, 1.0% Tertiary sands, 0.2% silcrete or ferricrete.

**Vegetation** (535 records): 100% shrubland, 0.4% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 2 900 km<sup>2</sup> with 6% conserved and 5% lost; Occupancy: 518 km<sup>2</sup> with 8% conserved and 2% lost. Fragmentation index: 9%.

**Nature Reserves** (542 records): 7% in nature reserves - inadequately conserved.

**Habitat destruction** (533 records): 95% extensive natural habitat, 3% islands, 1% naturally linear habitats.

**Alien Invasive Species** (518 records): 89% none, 10% *Pinus*.

**Alien Density** (518 records): 89% alien-free, 10% sparse.

**Cultivation & Utilization:**

**Picking** (374 records): 97% no sign of picking, 2% lightly picked, 0.3% severely picked.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

**Damage**

Lots of baboon damage for flowerheads -

mostly broken off (AGRY0042901);

Baboons picking? (APE92061308 + 13);

Picking? Flowerheads on road

(WMP99042506);

**Recruitment**

Currently 1/5-1/3 the previous generation as

seen from skeletons (AGRY0112323); 1/5 of

previous generation as per skeletons

(AGRY0112326);

Tumble weeds! Skeletons caught in fence but

appears no seedlings on fence - probably

after seed released and stems rotted but veld

still low (AGR97051817);

**Mortality**

6 dead plants seen! (AGR97100420); Lots of

dieback (AGRY0092920); Several dead

plants seen (AGRY2040605); Many dying  
plants (CFRY0072101);

**Pollination**

Tony saw mouse at flowerhead: it saw him and  
scouted down the bush and away before he  
could identify it. We had seen Three-striped  
and Spiny Mice around (SMRY0072104);

**Confusing Species:** No confusion noted.

Hybrids with *P. witzenbergiana* did pose  
problems however.

Records of identification queries = 6.

**Variation and Taxonomy:** Within stands a  
wide range of colour variants can be  
encountered: bracts may vary from green to  
green with red margins, or from deep claret  
to pale pink. Similarly, bract may hve a  
chestnut-brown indumentum or – more  
usually – a silvery pubescence.

**Distribution:** Add.

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*Protea recondita* Buek ex Meisn. 1856

**Hidden Sugarbush**  
*Gesigtoehousuikerkan*

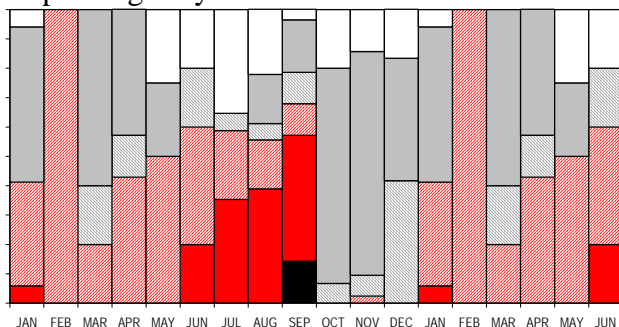
**Other Common Names:** Cedarberg Sugarbush, *Gesigtoehouprotea*, *Skaamroos*.  
**Other Scientific Names:** *None*.

**186 Records**

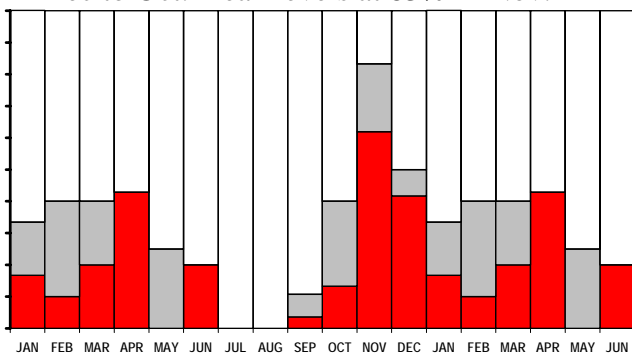
**Population** (185 records): 12% Common, 50% Frequent, 37% Rare, 1% Extinct.

**Dispersion** (148 records): 53% variable, 43% clumped, 2% evenly distributed, 1% widespread.

**Flowering** (180 records with: Jan 17, Feb 10, Mar 5, Apr 7, May 4, Jun 5, Jul 17, Aug 18, Sep 28, Oct 15, Nov 42, Dec 12): Buds from Jan to Jul; Flowering from Jun to Sep; Peak Flowering not significant in Sep; Over from Mar, Jun and Dec; Fruit from Oct to Jan and Mar to May; Nothing from May to Aug, and Oct. Peak levels at 79% in Sep. Historically recorded as flowering from May to Sep, peaking May to Jul.



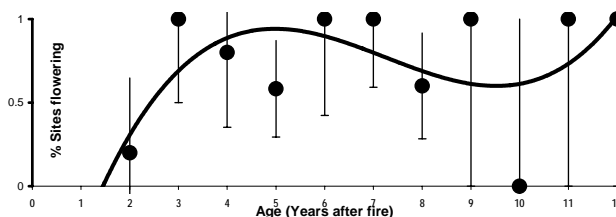
**Growth** (181 records with: Jan 18, Feb 10, Mar 5, Apr 7, May 4, Jun 5, Jul 17, Aug 18, Sep 28, Oct 15, Nov 42, Dec 12): Much from Mar to Apr. Jun and Nov to Dec; Rare from Feb to Mar, May and Oct to Nov; None from Dec to Oct. Peak levels at 83% in Nov.



**Seedlings** (57 records): Absent in 82%: fewer seedlings than prefire adults in 5 cases. Seedlings found in Mar and Aug (4).

**Fire Survival** (21 records): 52% survived by seedlings only, 24% escaped fires in fire-safe areas, 14% respouted from underground boles, 10% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 3-5 years, and 100% recorded at 6 years.



**Height** (181 records): 16% 0-0.2 m tall, 81% 0.2-1 m tall, 3% 1-2 m tall.

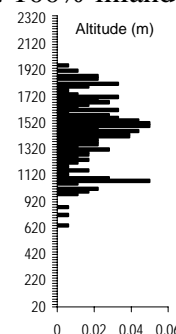
**Pollinators** (1 record): 100% mammals.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (180 records): 100% inland - further than 2 km from coast.

**Altitude** (180 records): 700 - 1860 m; 1180 *lq* - 1360 *med* - 1480 *uq*m.

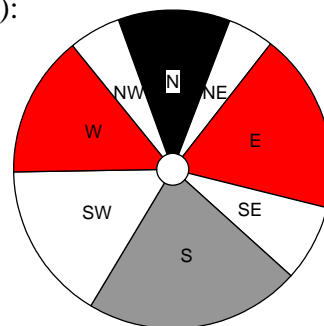


**Landform** (178 records): 46% deep soil, 46% shallow soil, 9% rocky outcrops.

**Slope** (178 records): 54% steep incline, 37% gentle incline, 4% hill top, 3% platform, 2% cliff.

**Aspect** (168 records):

33% South, 26% West, 25% East, 16% North.



**Soil Type** (178 records): 33% sandy, 25% loamy, 22% rocky, 13% gravelly, 7% clayey.

**Soil Colour** (178 records): 48% brown, 39% grey, 6% orange, 4% white, 2% black.

**Geology** (171 records): 80% sandstone, 20% shale.

**Vegetation** (178 records): 99% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened B1a(ii)+2a(ii).

**Occurrence** (Fynbos): 3 153 km<sup>2</sup> with 20% conserved and 13% lost; **Occupancy:** 181 km<sup>2</sup> with 40% conserved and 4% lost. **Fragmentation index:** 4%.

**Nature Reserves** (180 records): 58% in nature reserves - well conserved.

**Habitat destruction** (175 records): 94% extensive natural habitat, 3% naturally linear habitats, 2% islands.

**Alien Invasive Species** (169 records): 76% none, 24% *Pinus*.

**Alien Density** (169 records): 76% alien-free, 22% sparse, 1% abundant.

**Cultivation & Utilization:**

**Picking** (82 records): 99% no sign of picking,  
1% severely picked.

**Cultivation Status:** Plantings - 1 record  
(0.5%).

**Atlassers Notes:**

Young leaves are elongated; older leaves are  
ovoid (WIJY0102907);  
Some plants had reddish leaves all over and  
others green leaves (WIJ92040503);  
Top leaves of nearly all plants eaten off - lovely  
juicy plants! (AWA96101501);  
One third of the plants dead (APE92101806);  
Young plant emerging from mass of seed below  
skeleton (APE93110602);  
1 large skeleton - no signs of young  
(AGR96111709);

**Confusing Species:** Misidentified with *P.*  
*effusa* which does not have the larger  
terminal leaves hiding the flowerheads, and  
narrower stem leaves.

Records of identification queries = 13.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** Pure green  
involucral bracts are most abundant, but  
plants with bright red-rimmed bracts often  
occur.

**Distribution:** Add.

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*Protea sulphurea* Phill. 1910

**Sulphur Sugarbush**

*Swaelsuikerbos*

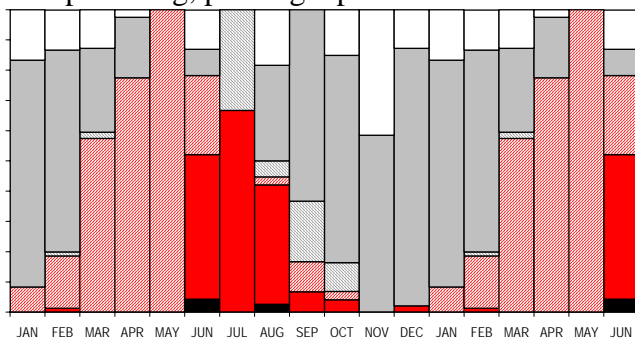
**Other Common Names:** Honeycomb Protea, Sulphur-coloured Sugarbush, *Heuningkoeksuikerbos*, *Skaamroos*.  
**Other Scientific Names:** *None*.

**462 Records**

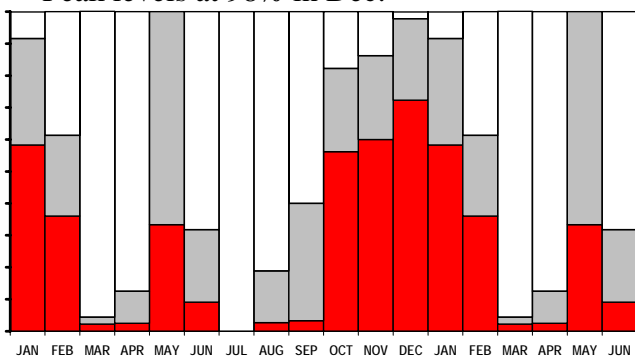
**Population** (459 records): 14% Common, 51% Frequent, 34% Rare.

**Dispersion** (389 records): 64% variable, 31% clumped, 4% widespread, 1% evenly distributed.

**Flowering** (456 records with: Jan 12, Feb 75, Mar 47, Apr 40, May 3, Jun 23, Jul 3, Aug 38, Sep 30, Oct 73, Nov 65, Dec 47): Buds from Mar to Jun; Flowering from Jun to Aug; Peak Flowering not significant; Over from Jul and Sep; Fruit from Aug to Apr; Nothing from Nov. Peak levels at 78% in Jun. Historically recorded as flowering from Apr to Aug, peaking Apr to Jun.



**Growth** (451 records with: Jan 12, Feb 75, Mar 46, Apr 40, May 3, Jun 22, Jul 1, Aug 37, Sep 30, Oct 73, Nov 65, Dec 47): Much from Oct to Feb and May; Rare from Sep to Feb and May to Jun; None from Feb to Sep. Peak levels at 98% in Dec.

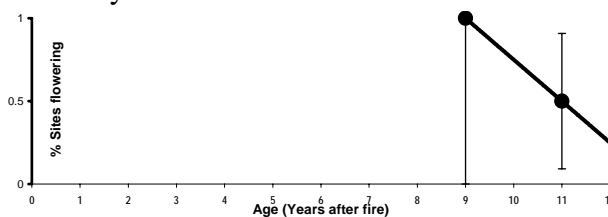


**Seedlings** (145 records): Absent in 97%; fewer seedlings than prefire adults in 2 cases. Seedlings found in Jan and Feb.

**Fire Survival** (10 records): 60% resprouted from underground boles, 20% escaped fires in fire-safe areas, 10% eliminated from the area by fires, 10% survived by seedlings only.

**Age to first flowering:** Data thin, but first flowers recorded at 3 years, 50% estimated at

9-11 years, and 100% recorded consistently at 16 years.



**Height** (455 records): 8% 0-0.2 m tall, 85% 0.2-1 m tall, 7% 1-2 m tall.

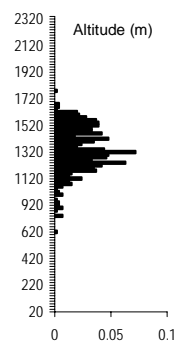
**Pollinators** (3 records): 33% birds, 33% mammals, 33% bees or wasps.

**Detailed Pollinators** (2 records): Orange-breasted Sunbird, Honey Bee.

**Habitat:**

**Distance to Ocean** (457 records): 100% inland - further than 2 km from coast.

**Altitude** (457 records): 600 - 1680 m; 1120 *lq* - 1220 *med* - 1300 *uq*m.



**Landform** (455 records): 63% shallow soil, 32% deep soil, 5% rocky outcrops.

**Slope** (456 records): 52% steep incline, 29% gentle incline, 13% hill top, 5% cliff.

**Aspect** (408 records): 64% South, 16% North, 11% East, 9% West.

**Soil Type** (450 records):

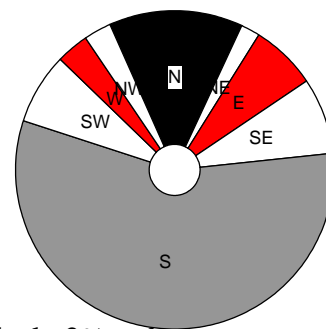
36% loamy, 26% sandy, 26% rocky, 9% gravelly, 2% clayey.

**Soil Colour** (448 records):

53% brown, 34% grey, 6% orange, 4% black, 2% red.

**Geology** (385 records): 86% sandstone, 13% shale.

**Vegetation** (455 records): 100% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 2 229km<sup>2</sup> with 19% conserved and 2% lost; Occupancy: 527 km<sup>2</sup> with 14% conserved and 1% lost. Fragmentation index: 8%.

**Nature Reserves** (457 records): 18% in nature reserves - inadequately conserved.

**Habitat destruction** (451 records): 95% extensive natural habitat, 4% naturally linear habitats.

**Alien Invasive Species** (446 records): 100% none.

**Alien Density** (446 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (330 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 29 records (6%).

**Atlassers Notes:**

**Variation**

One plant 2m tall 4m diameter another 1.7m tall 7m diameter (AGRY3112015); Several metres in diameter (SHR93080802);

Couple of albino plants present (SHRY0031806);

These plants all of the form with red bracts (NAH96090901);

**Mortality**

Very old plants - half of the population dead (AMMY3112010);

Some only partially burnt (DOAY2090451+52); 1 skeleton seen (AGRY0031829);

**Pollination**

Undoubtedly mouse pollinated (EGH94071302); Signs of rodent destruction of flowers (GEDY5100701);

Clearly visited by bees and resident male sunbird (EGH94071404);

**Habitat**

Much taller and more prolific at base of sandstone adjacent shaleband - however no differences in abundance and no plants on shale proper (AGRY0031824); Only on S facing edge of ridge crest (STO96121602);

**Witches Broom**

A lot (DOA96121311); Covered (LKA99080901);

With 1 infection (100mm diam.) (STO96121602);

Splendid colours! (AGR93100309); Bright yellow red (WMP96121601);

**Confusing Species:** Misidentified with *P. susanna* (transcription error) and *P. venusta* (which when not in flower has much larger, bright green leaves).

Records of identification queries = 5.

Records of corrected identification queries = 3.

**Variation and Taxonomy:** Bract color varies with forms in the eastern end being uniformly wine red.

**Distribution:** Add.

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*Protea acaulos* (L.) Reichard 1737, <date>  
Common Ground Sugarbush

**Other Common Names:** Dwarfgreen Sugarbush, Mountain Rose, Ordinary Ground Sugarbush, Sealavender-leaf Erodendrum, *Aardroos*, *Aardrosie*.

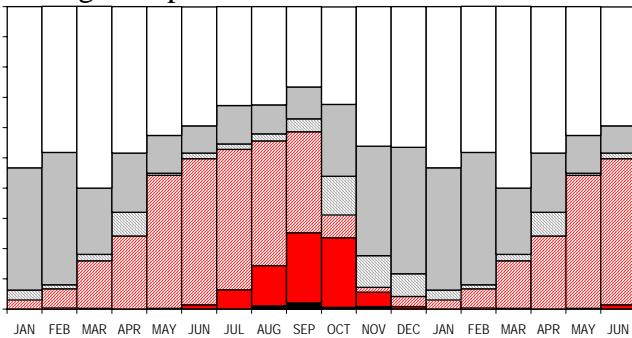
**Other Scientific Names:** *glaucophylla* Salisb 1805, *limoniifolium* (Salisb. ex Knight) 1809, *nana* Lam 1791.

**3808 Records**

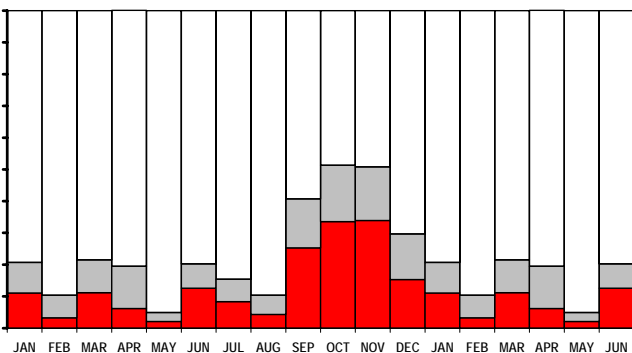
**Population** (3787 records): 14% Common, 51% Frequent, 34% Rare.

**Dispersion** (3158 records): 73% variable, 21% clumped, 4% widespread, 1% evenly distributed.

**Flowering** (3759 records with: Jan 270, Feb 240, Mar 338, Apr 219, May 289, Jun 211, Jul 220, Aug 354, Sep 467, Oct 491, Nov 447, Dec 213): Buds from Apr to Sep; Flowering from Sep to Oct; Peak Flowering and Over not significant; Fruit from Oct to Apr; Nothing from all year round. Peak levels at 63% in Sep. Historically recorded as flowering from Jun to Nov, peaking from Aug to Sep.



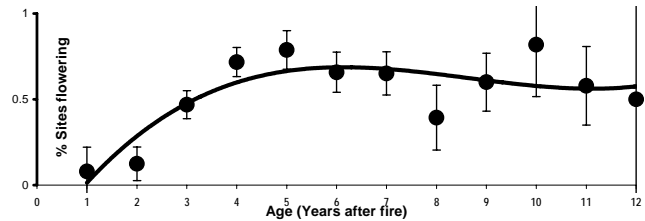
**Growth** (3711 records with: Jan 270, Feb 240, Mar 330, Apr 211, May 286, Jun 207, Jul 214, Aug 346, Sep 462, Oct 485, Nov 451, Dec 209): Much from Sep to Nov; Rare not significant; None from all year round. Peak levels at 51% in Oct.



**Seedlings** (1418 records): Absent in 94%: fewer seedlings than prefire adults in 16 cases, and more in 23 cases. Seedlings found in Jan (5), Mar (6), Apr (3), Jun, Jul (3), Aug, Oct, Nov (18) and Dec.

**Fire Survival** (444 records): 94% resprouted from underground boles, 3% survived by seedlings only, 2% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3-4 years, and 100% recorded at 13 years.



**Height** (3781 records): 92% 0-0.2 m tall, 8% 0.2-1 m tall.

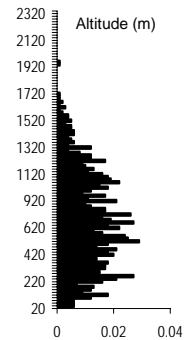
**Pollinators** (8 records): 75% mammals, 13% birds, 13% bees or wasps.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (3698 records): 90% inland - further than 2 km from coast.

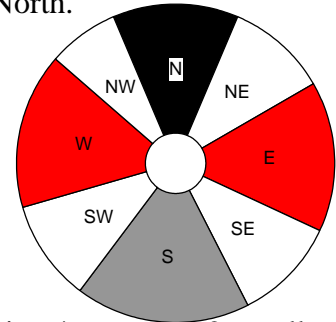
**Altitude** (3698 records): 20 - 1920 m; 360 *lq* - 640 *med* - 920 *uq* m.



**Landform** (3693 records): 77% deep soil, 18% shallow soil, 4% rocky outcrops.

**Slope** (3687 records): 48% gentle incline, 35% steep incline, 9% platform, 5% hill top, 2% valley bottom.

**Aspect** (3254 records): 28% South, 25% East, 25% West, 22% North.



**Soil Type** (3676 records): 56% sandy, 23% loamy, 12% gravelly, 5% rocky, 4% clayey.

**Soil Colour** (3661 records): 48% brown, 37% grey, 5% white, 4% orange, 2% yellow, 1% red, 1% black.

**Geology** (3602 records): 74% sandstone, 13% shale, 8% granite, 3% Tertiary sands, 2% silcrete or ferricrete.

**Vegetation** (3692 records): 97% shrubland, 1% plantations, 1% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern. Occurrence (Fynbos): 19 613 km<sup>2</sup> with 18% conserved and 22% lost; Occupancy: 2 510 km<sup>2</sup> with 43% conserved and 14% lost. Fragmentation index: 6%.

**Nature Reserves** (3698 records): 57% in nature reserves - well conserved.

**Habitat destruction** (3632 records): 95% extensive natural habitat, 2% islands, 1% naturally linear habitats.

**Alien Invasive Species** (3582 records):

47% none, 24% *Pinus*, 14% *Hakea*,  
14% Fabaceae (chiefly alien *Acacia*),  
2% Myrtaceae.

**Alien Density** (3569 records): 47% alien-free,  
42% sparse, 9% abundant, 2% dense.

**Cultivation & Utilization:**

**Picking** (2380 records): 100% no sign of  
picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 8 records (0.2%).

**Atlassers Notes:**

**Size**

Could also be viewed as one enormous  
specimen covering the whole area  
(AKS92080403);

**Flowering**

About 10% of plants in flower (AJT93100207);  
Again some plants have flowers out of time  
with what we found generally  
(AWA97091305); Odd flower open  
(FBH96081101-2); Recorded as in bud  
although only 10% of plants showing any  
signs of flowering – *i.e.* 90% of plants with  
nothing (HCE96080503); Difficult deciding  
on code because a few (the minority) were  
just beginning to bud (JAT93040303); About  
20% of plants in bud (NAH94021901);  
Although atlassed with flowering code n  
there were a very few plants that were in  
flower (NGF95080503); Some 2 had buds &  
1 had flower (SMR99092401);

The plants here in full flower unlike those lower  
down - obviously like an alcoholic they like  
being high (PVR98090608);

One plant had four clustered flowerheads all  
touching each other at the base of the leaves  
I had never seen this before and considered it  
to be unusual (NGF97101101);

Everything was resprouting! unusual thin green  
leaves (only 1 plant showed a few old tough  
leaves in the middle) (SMRY0101907);

Form with short erect stems (100mm long) and  
narrow thin leaves (AGR96020404); Very  
long stems above ground (APE92100403);

**Variation**

Leaves 85mm wide! (AGR96041702); Broad  
leaf blade – rounded (AGRY0081209);  
Round- leafed variety (AKS95101403);  
Broad leaf type (GEH93053004); Wide leaf  
70mm (OGM92122805); Very broad leaves  
(PAP94091402); Very broad leaves with  
pointed (needle-like) tips, no stem  
(WIJ98031409);

Narrow leaf form - but distinct blade  
(AGRY0081205); *P. laevis*-type leaves  
(narrow) (AMMY3112517-18); Narrow leaf  
form 8-10mm wide, bright green glabrous  
(GEH93050902); Narrow leaf (7mm Wide)  
(GEH93052102-3); Very narrow leaf  
(JAT96093001); Leaves 16-18mm wide  
tapered to base (NAH94021901); Narrow  
leaf 30mm (OGM92122803); Leaves thin -  
those at Kleinmond up to 30mm across  
(PAP94081701); Very narrow elongated  
leaves (13mm wide) (WIJ98021403); Leaves  
3-6mm wide 10cm long (WIJY0091705);

Very dark green leaves (JAT96022802);  
Exceptionally small leaves (JAT96022803);  
Leaves large (WMPY0112601);

150mm stalk? (GYC95111401);

Buds at the end of runners (PNR98092601-02);  
Long trailing stems and unusual involucre  
bracts (SHR98120503); Stems mostly  
creeping above ground (SMR99060907-10);  
Long sprawling branches above ground  
(WIJY1111703);

**Miscellaneous**

Rapid growth in the burnt area  
(HCE96062202);

One plant seemed to have been grazed  
(SMRY0032905);

**Stress and mortality**

Many plants with dead leaves  
(AWAY0100403); Looked stressed  
(LYM97070605);

Half plants dead (AGRY0081313);

**Visitors**

A Koringkriek of all things was on the  
flowerhead but he wasn't pollinating  
(AWA96101803);

Ants - may be pollinators (JAT92103103);

**Distribution**

*Leucospermum pedunculatum* and *P. acaulos*  
seem to be frequently growing very closely  
together in this area - is there something of a  
relationship here? (NAH94021901);

Clumped by roadside and on middelmannetjie -  
seeds on wheels service? (SMR99053103);

**Witches Broom**

On one plant (FBH96081102); On odd plant  
(FBH96091302);

**Confusing Species:** A major problem was  
experienced in distinguishing *P. acaulos* and  
the narrow leaf form of *P. laevis* in the  
Cedarberg area.. Technically the former has  
underground stems and resprouts (*versus*  
surface stems that are killed by fire, and has  
leaves with a distinct stalk (*versus* tapering  
to the base) and straight (*versus* wavy)  
margins. However, in the field *acaulos*  
around the Cedarberg often had short to long  
stems that originated from a rootstock and  
*laevis* often survived fires when the stems  
were covered by erosion with sand.  
Inspection of herbarium data revealed that  
*laevis* typically had brown long, papery,  
brown bud bracts (to protect buds when  
growth ceases) called cataphylls that were  
never present in *acaulos* – but in the field  
these appeared to be short-lived and  
unreliable. Some populations could not  
reliably be assigned to one of the two species  
and atlas data must be treated with this in  
mind. Almost all these intermediate plants  
are assigned to *P. laevis* in herbaria, but they  
seem to be remarkably undercollected.  
Single instances of misidentification with *P.*  
*aspera* (rough leaves), *P. amplexicaulos*  
(heart-shaped leaves) and *P. ceaspitosa*  
(above ground stems) were noted.

Records of identification queries = 111.

Records of corrected identification queries = 44.

**Variation and Taxonomy:** Atlassers were  
bewildered by the variety of leaf sizes and  
shapes, as well as some stems being  
completely underground, but sometimes –  
especially Piketberg and Olifants River  
Mountains – on prostrate stems arising from  
underground stems. The intermediate forms

grading into *P. laevis* did not help. The following variation is noted but not formally recognized:

- Hottentots Holland: flat, broadly ovate leaves with rounded tips and a long, gradually tapering stalk.
- Agulhas region: narrower (10mm wide) leaves to very narrowly oblanceolate or narrowly oblong.
- Cedarberg, Cold Bokkeveld and Piketberg: short clearly differentiated stalk, abruptly broadening into the leaf blade, tips sharply pointed and margins occ. wavy.

**Distribution:** Add.

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*Protea angustata* R.Br. 1810  
Kleinmond Sugarbush

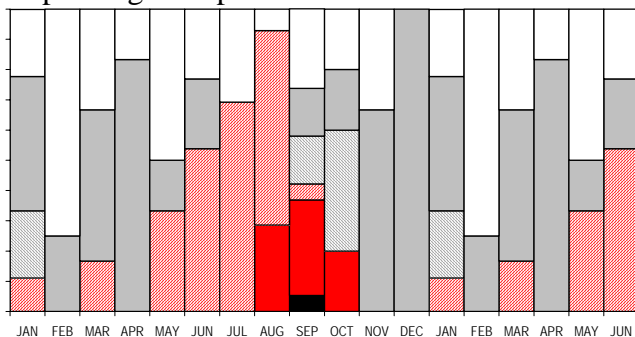
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**102 Records**

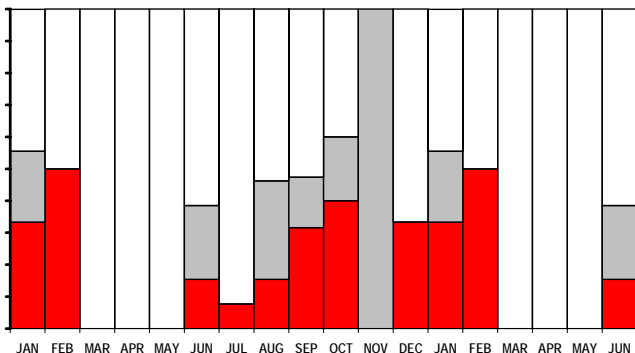
**Population** (100 records): 1% Common, 47% Frequent, 52% Rare.

**Dispersion** (85 records): 49% variable, 45% clumped, 4% widespread, 2% evenly distributed.

**Flowering** (101 records with: Jan 9, Feb 4, Mar 6, Apr 6, May 6, Jun 13, Jul 13, Aug 14, Sep 19, Oct 5, Nov 3, Dec 3): Buds from May to Aug; Flowering from Aug to Oct; Peak Flowering not significant; Over from Jan and Oct; Fruit from Oct to Apr and Jun; Nothing from Jan to Mar, May to Jul and Sep to Nov. Peak levels at 93% in Aug. Historically recorded as flowering from Jul to Oct, peaking in Sep.



**Growth** (100 records with: Jan 9, Feb 4, Mar 6, Apr 6, May 6, Jun 13, Jul 13, Aug 13, Sep 19, Oct 5, Nov 3, Dec 3): Much from Sep to Feb; Rare from Jan, Jun, Aug and Oct to Nov; None from all year round. Peak levels unreliable at 100 in Nov.



**Seedlings** (56 records): Absent in 96%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jan.

**Fire Survival** (9 records): 100% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 3 years, 50% estimated at 2-3 years, and 100% recorded at 3 years, with a marked decline after 9 years.



**Height** (101 records): 67% 0-0.2 m tall, 33% 0.2-1 m tall.

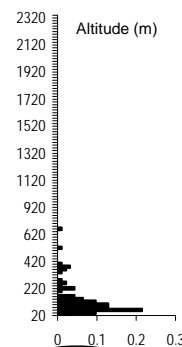
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (92 records): 77% coastal - less than 2 km from coast.

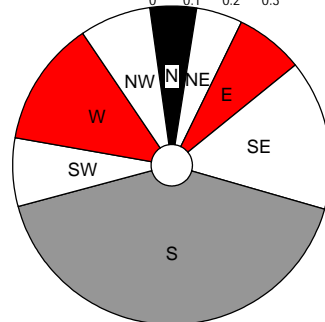
**Altitude** (92 records): 20 - 660 m; 40<sub>lq</sub> - 60<sub>med</sub> - 60<sub>uq</sub>m.



**Landform** (92 records): 72% deep soil, 20% shallow soil, 9% rocky outcrops.

**Slope** (92 records): 70% gentle incline, 20% steep incline, 5% platform, 4% valley bottom, 1% hill top.

**Aspect** (85 records): 54% South, 20% West, 16% East, 10% North.



**Soil Type** (92 records): 79% sandy, 13% loamy, 3% clayey, 2% gravelly, 1% peaty, 1% rocky.

**Soil Colour** (92 records): 53% grey, 22% brown, 15% white, 5% black, 2% yellow, 2% orange.

**Geology** (89 records): 84% sandstone, 10% shale, 4% Tertiary sands, 1% conglomerate.

**Vegetation** (92 records): 96% shrubland, 4% suburban.

**Conservation Status and Threat:**

**Red Data List Status:** Endangered C1.

**Occurrence** (Fynbos): 547 km<sup>2</sup> with 31% conserved and 29% lost; **Occupancy:** 96 km<sup>2</sup> with 30% conserved and 21% lost. **Fragmentation index:** 28%.

**Nature Reserves** (92 records): 38% in nature reserves.

**Habitat destruction** (92 records): 88% extensive natural habitat, 10% islands, 1% road verges, 1% naturally linear habitats.

**Alien Invasive Species** (91 records): 35% none, 29% Fabaceae (chiefly alien *Acacia*), 20% *Pinus*, 10% Myrtaceae, 7% *Hakea*.

**Alien Density** (91 records): 35% alien-free, 55% sparse, 8% abundant, 2% dense.

**Cultivation & Utilization:**

**Picking** (79 records): 97% no sign of picking, 3% lightly picked.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 2 records (2%).

**Atlassers Notes:**

Betties Bay - leaves broader than Kleinmond variety (PAP93090401);

About 30 plants (DSNY0072501); 1 very large plant (SJKY0012001);

**Confusing Species:** Misidentified with *P. acuminata* (which looks totally different, probably a transcription error) and *P. scabra*

(which has rough leaves and leaves born on underground stems).

Records of identification queries = 9.

Records of corrected identification queries = 2.

**Variation and Taxonomy:** No variation formally noted, although atlas data suggest that it does exist, at least in leaf size.

**Distribution:** Add.

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*Protea convexa* Phill. 1910  
**Large-leaf Sugarbush**

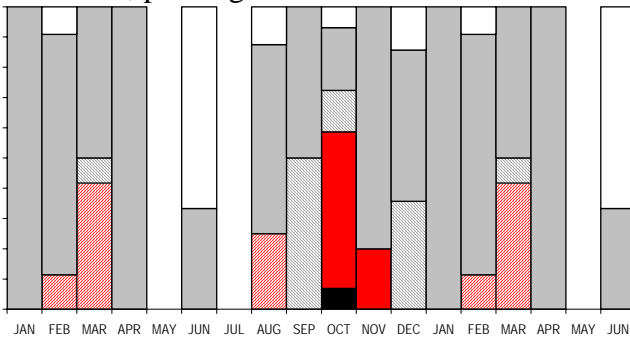
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**129 Records**

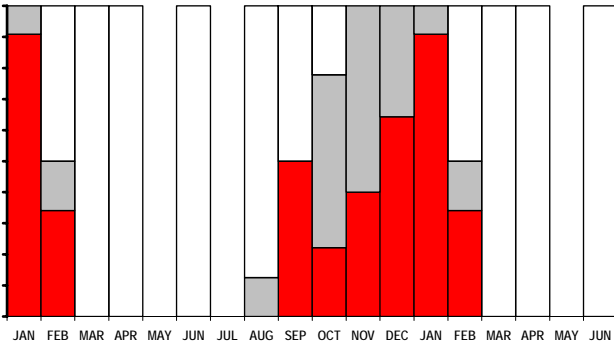
**Population** (129 records): 20% Common, 52% Frequent, 28% Rare.

**Dispersion** (115 records): 57% variable, 40% clumped, 2% widespread.

**Flowering** (129 records with: Jan 11, Feb 44, Mar 12, Apr 1, May 0, Jun 3, Jul 0, Aug 8, Sep 2, Oct 29, Nov 5, Dec 14): Buds from Mar and Aug-; Flowering from Oct to Nov; Peak Flowering not significant; Over from Sep and Dec; Fruit from all year round; Nothing from Jun. Peak levels at 72% in Oct. Historically recorded as flowering from Aug to Nov, peaking in Oct.



**Growth** (127 records with: Jan 11, Feb 44, Mar 12, Apr 1, May 0, Jun 3, Jul 0, Aug 8, Sep 2, Oct 27, Nov 5, Dec 14): Much from Sep to Feb; Rare from Oct to Dec; None from Feb to Oct. Peak levels at 100% in Nov to Jan.



**Seedlings** (52 records): All without any seedlings present.

**Fire Survival** : No data.

**Age to first flowering:** First flowers recorded at 9 years and 100% recorded at 21 years.



**Height** (128 records): 54% 0-0.2 m tall, 45% 0.2-1 m tall.

**Pollinators** (2 records): 50% mammals, 50% bees or wasps.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (128 records): 100% inland - further than 2 km from coast.

**Altitude** (128 records): 880 - 2000 m; 1280 *lq* - 1400 *med* - 1480 *uq* m.

**Landform** (128 records): 77% shallow soil, 20% deep soil, 3% rocky outcrops.

**Slope** (128 records): 44% steep incline, 30% gentle incline, 20% hill top, 5% platform, 2% cliff.

**Aspect** (108 records): 65% South, 14% North, 11% East, 10% West.

**Soil Type** (127 records): 35% rocky, 24% sandy, 22% loamy, 18% gravelly, 2% clayey.

**Soil Colour** (128 records): 48% grey, 38% brown, 7% orange, 4% yellow, 3% red.

**Geology** (103 records): 92% sandstone, 8% shale.

**Vegetation** (128 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Critically Endangered A4c.

**Occurrence (Fynbos):** 983 km<sup>2</sup> with 15% conserved and 1% lost; **Occupancy:** 189 km<sup>2</sup> with 17% conserved and 0% lost. **Fragmentation index:** 2%.

**Nature Reserves** (128 records): 19% in nature reserves - inadequately conserved.

**Habitat destruction** (126 records): 94% extensive natural habitat, 6% naturally linear habitats.

**Alien Invasive Species** (128 records): 98% none, 2% *Pinus*.

**Alien Density** (128 records): 98% alien-free, 2% sparse.

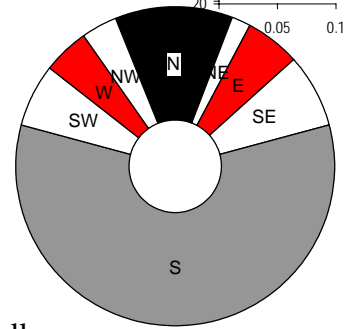
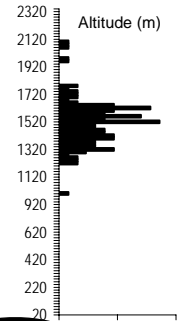
**Cultivation & Utilization:**

**Picking** (98 records): 100% no sign of picking.  
**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

14 plants over 50m (AGRY0031922); Only two discovered in area (AMA92090601); Jan Vlok has on a previous occasion found 10-12 plants at this site (DOA93063001);

1 plant had an old flower head (DOA93063001);



Plus 6 deads - although most plants are on the northern aspect the few plants on the south aspect look healthier and have less dead leaves and branches (AGRY1020817); A lot of dead plants (AMMY1020806); Lots of dead plants - at least 1/2 plants with dead branches (ASP94100813);

Healthy population - on flat area with gentle slope (AMA93032504);

**Confusing Species:** A single case of mistaken for *P. scolopendriifolia*, which has much narrower leaves and flowers with elongated involucre bracts. The large cabbage-like

leaves with red resin on the leaf bases and stems is diagnostic.

Records of identification queries = 2.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** .

**Distribution:** Add.

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***Protea laevis* R.Br. 1810**  
**Smooth-leaf Sugarbush**

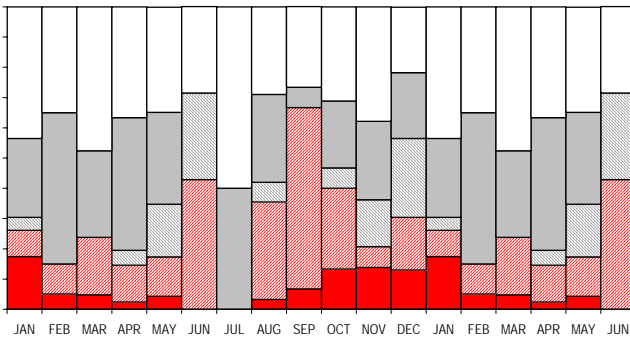
**Other Common Names:** Glaucous-leaf Erodendrum, *Gladdeblaardwergprotea*.  
**Other Scientific Names:** *elongata* RBr 1810, *glaucophyllum* Salisb. ex Knight 1809, *zeyheri* Phill 1910.

**317 Records**

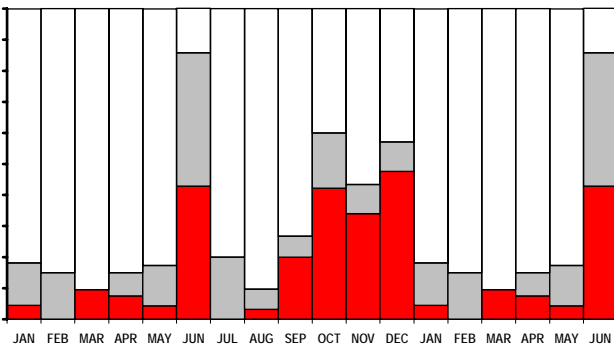
**Population** (312 records): 15% Common, 54% Frequent, 31% Rare.

**Dispersion** (269 records): 61% variable, 28% clumped, 9% widespread, 2% evenly distributed.

**Flowering** (312 records with: Jan 23, Feb 20, Mar 21, Apr 41, May 23, Jun 7, Jul 5, Aug 31, Sep 15, Oct 45, Nov 58, Dec 23): Buds from Jun and Aug to Oct; Flowering from not significant from Oct to Jan; Peak Flowering not recorded; Over from Jun and Dec; Fruit from Oct to May and Jul to Aug; Nothing from all year round. Peak levels at 67% in Sep. Historically recorded as flowering from Sep to Feb, mainly Sep to Nov.



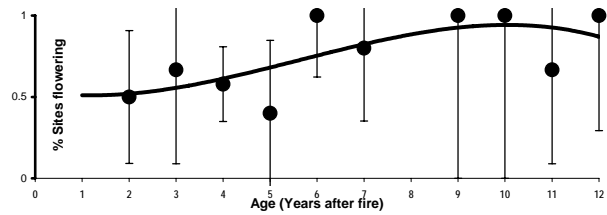
**Growth** (303 records with: Jan 22, Feb 20, Mar 21, Apr 40, May 23, Jun 7, Jul 5, Aug 31, Sep 15, Oct 45, Nov 53, Dec 21): Much from Jun and Sep to Dec; Rare from Jun to Jul; None from Jul to May. Peak levels at 60% in Oct.



**Seedlings** (115 records): Absent in 95%; fewer seedlings than prefire adults in 1 case, and more in 2 cases. Seedlings found in Aug, Sep and Nov.

**Fire Survival** (24 records): 92% resprouted from underground boles, 8% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 3-4 years, and 100% recorded at 6 years.



**Height** (313 records): 85% 0-0.2 m tall, 14% 0.2-1 m tall.

**Pollinators** (1 record): 100% bees or wasps.  
**Detailed Pollinators:** No additional data.

**Habitat:**

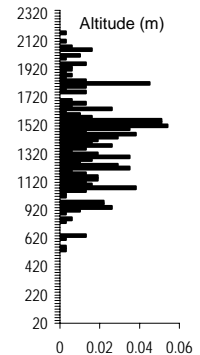
**Distance to Ocean** (313 records): 100% inland - further than 2 km from coast.

**Altitude** (313 records): 520 - 2080 m; 1060 *lq* - 1340 *med* - 1460 *uq*m.

**Landform** (310 records): 68% deep soil, 27% shallow soil, 4% rocky outcrops, 1% swamp.

**Slope** (309 records): 45% gentle incline, 22% steep incline, 20% platform, 9% valley bottom, 3% hill top, 1% cliff.

**Aspect** (240 records): 29% East, 26% South, 23% North, 23% West.

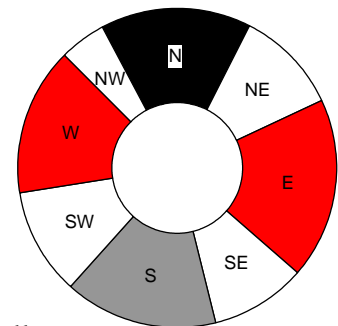


**Soil Type** (311 records): 63% sandy, 14% loamy, 13% gravelly, 9% rocky, 2% clayey.

**Soil Colour** (309 records): 45% grey, 34% brown, 11% white, 7% yellow, 2% orange, 1.0% black.

**Geology** (299 records): 87% sandstone, 12% shale, 1% Tertiary sands.

**Vegetation** (307 records): 98% shrubland, 2% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 7 399 km<sup>2</sup> with 18% conserved and 11% lost; **Occupancy:** 711 km<sup>2</sup> with 29% conserved and 2% lost. **Fragmentation index:** 6%.

**Nature Reserves** (313 records): 48% in nature reserves.

**Habitat destruction** (303 records): 94% extensive natural habitat, 4% islands, 1.0% naturally linear habitats.

**Alien Invasive Species** (293 records): 82% none, 16% *Pinus*, 2% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (293 records): 82% alien-free, 14% sparse, 4% abundant.

**Cultivation & Utilization:**

**Picking** (182 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 2 records (0.6%).

**Atlassers Notes:**

Killed by fire? They haven't read the book they where resprouting over big areas! and big mats in the unburnt section we found them with buds in the burnt section I pulled up roots/stems from underground with new growth on it (AWAY0102204); Appeared resprouting (WIJ95123113);

Big leaf tussock form (AGRY1022210); Wide leaf - flower 60mm diam. (GEH96011204);

All for day and next day were big form (AGRY4110604); Big - no small forms seen on this trip (AGRY4110613, AGRY4110701);

Long lanceolate leaves fine red tip branching above ground wide mats 1-1.5m (OUT98092602);

Short- with long- leaved plants (WIJ95020407); Both types in this plot (WMPY2051104);

Just over 100 plants on a narrow strip 100m long! lovely flowers (AWA99100302); Hundreds of plants present (WIJ93111206);

Tops of leaves eaten off - by ?buck (WIJY0102910);

Rodent chewing and scats and clear runs between plants! (AGRY4110701);

In moister areas (SGAY1032104); On vlaktes only (WIJ93111301, WIJY0042902); Along possible seep/stream - but dry at present (WMPY1032105); Near seep (WMPY2051103);

Much Witches Broom (WMPY0042710);

**Confusing Species:** The big form of *P. laevis* is quite distinct and not easily confused with other species. However, as it was not suspected that two forms existed many atlassers did not note the form and thus the data herein possibly include small-leaf forms.

Records of identification queries = 49.

Records of corrected identification queries = 3.

**Variation and Taxonomy:** This is the broad-leaf variant: see the short-leaf form for details of variation in this species.

**Distribution:** Add.

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## *Protea laevis* small-leaf R.Br

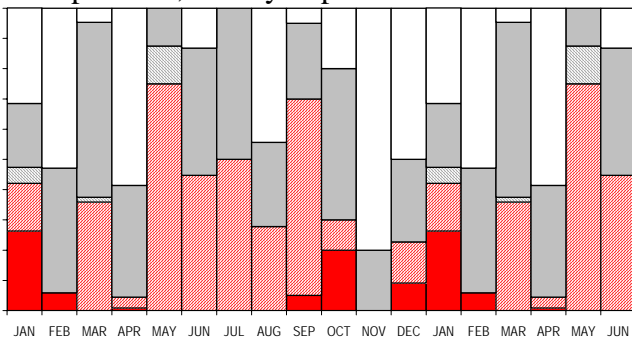
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

### 346 Records

**Population** (345 records): 0.6% Abundant, 24% Common, 52% Frequent, 23% Rare.

**Dispersion** (304 records): 78% variable, 18% clumped, 3% widespread, 1.0% evenly distributed.

**Flowering** (342 records with: Jan 19, Feb 17, Mar 64, Apr 111, May 8, Jun 38, Jul 10, Aug 18, Sep 20, Oct 10, Nov 5, Dec 22): Buds from Mar and May to Sep; Flowering from Jan and Oct; Peak Flowering not recorded; Over not significant; Fruit from Jun to Apr; Nothing from Oct to Feb, Apr and Aug. Peak levels at 70% in Sep. Historically not recorded as to flowering but probably from Sep to Feb, mainly Sep to Nov.



**Height** (341 records): 94% 0-0.2 m tall, 6% 0.2-1 m tall.

**Pollinators** (1 record): 100% birds.

**Detailed Pollinators** (1 record): Orange-breasted Sunbird.

### Habitat:

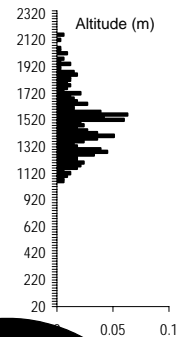
**Distance to Ocean** (332 records): 100% inland - further than 2 km from coast.

**Altitude** (332 records): 940 - 2060 m; 1180 *lq* - 1340 *med* - 1460 *uq*m.

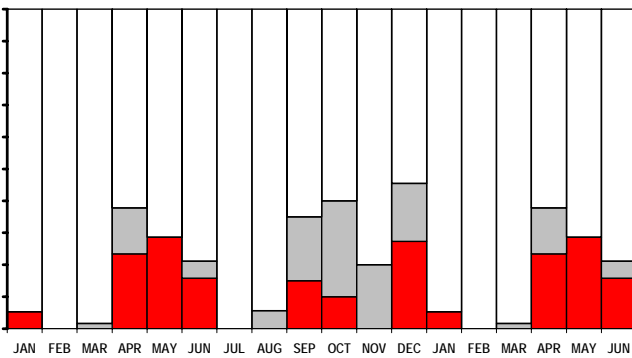
**Landform** (326 records): 62% deep soil, 36% shallow soil, 3% rocky outcrops.

**Slope** (327 records): 66% gentle incline, 21% steep incline, 7% hill top, 6% platform, 1% valley bottom.

**Aspect** (299 records): 31% North, 27% South, 26% East, 16% West.



**Growth** (340 records with: Jan 19, Feb 17, Mar 64, Apr 111, May 7, Jun 38, Jul 9, Aug 18, Sep 20, Oct 10, Nov 5, Dec 22): Much from Apr to May and Dec; Rare from Sep to Nov; None from all year round. Peak levels at 46% in Dec.

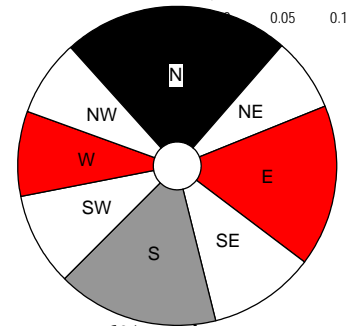


**Soil Type** (327 records): 45% sandy, 23% gravelly, 15% rocky, 14% loamy, 3% clayey.

**Soil Colour** (324 records): 36% brown, 35% grey, 13% yellow, 9% orange, 6% white.

**Geology** (324 records): 78% sandstone, 20% shale, 2% Tertiary sands.

**Vegetation** (327 records): 99% shrubland.



### Conservation Status and Threat:

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 2 452 km<sup>2</sup> with 10% conserved and 12% lost; **Occupancy:** 138 km<sup>2</sup> with 40% conserved and 1% lost. **Fragmentation index:** 5%.

**Nature Reserves** (332 records): 13% in nature reserves - inadequately conserved.

**Habitat destruction** (322 records): 95% extensive natural habitat, 3% islands.

**Alien Invasive Species** (314 records): 92% none, 7% *Pinus*.

**Alien Density** (314 records): 92% alien-free, 7% sparse.

### Cultivation & Utilization:

**Picking** (152 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (0.3%).

**Seedlings** (76 records): Absent in 95%: fewer seedlings than prefire adults in 1 case, and more in 1 case. Seedlings found in Jun and Oct.

**Fire Survival** (60 records): 97% resprouted from underground boles, 2% survived by seedlings only, 2% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% recorded at 5 years.

**Atlassers Notes:**

Very few plants with cones in evidence - probably only flowered for one very short period since burn (NAH92051602);

In burnt areas new leaves up to 80mm long numerous seeds freshly shed (WIJ99042403);

Resprouting over entire area (APE92061405);

Resprouting apparently (WIJY0012801);

Dieback (presumably drought) (GEDY0112322);

More than 20 dead (AGRY0091506);

On flattish moist area (WIJY0040106);

**Confusing Species:** Because it turned out that the large-leaf form was relatively rare compared to the small-leaf form, this data includes all records where the leaf size was not specified: this thus probably includes significant records of the big form.

The small leaf form is far more difficult to identify than the distinctive large-leaf form. Some 210 records did not specify if the big or small leaf form was observed. Almost 80% of misidentifications were with *P. revoluta*, which has much narrower leaves (but up to 13mm wide, not 3mm as in Rourke) distinctly rolled leaf margins (not flat) and rhizomatous stems (not surface, but see notes!). Most of the other misidentifications were with *P. acaulos* (*cf.*), which is also rhizomatous.

Because of the abundance of these misidentifications, and despite the issue being actively addressed during the project, atlas data (and the species circumscriptions) should be treated with caution.

A single case of *P. scolopendrifolia* (with pointed involucre bracts and rhizomatous stems) was noted.

Records of identification queries = 293.

Records of corrected identification queries = 267.

**Variation and Taxonomy:** This is a complex, highly plastic species with innumerable variants. The leaves vary in form, texture and dimensions. Populations on moist sites have large flaccid leaves. Populations on drier sites have much shorter leaves with a harder texture. The extremes occasionally coexist and are genetically distinct – there are no intermediates in the wild, and in cultivation they retain their characters. No attempt to catalogue or formally describe these variants has been attempted. From atlas data the small leaf form also appears to approach both *P. acaulos* and *P. revoluta* in characters.

**Distribution:** Add.

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## *Protea revoluta* R.Br. 1810 Rolled-leaf Sugarbush

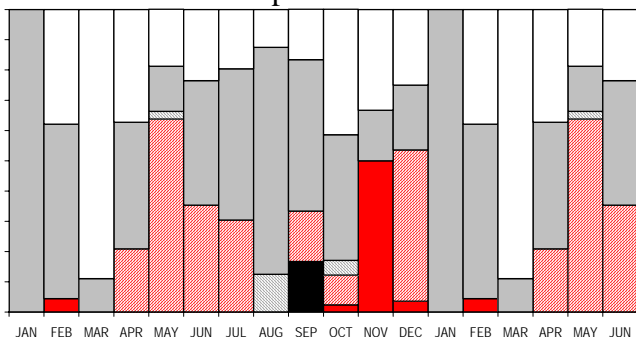
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

### 381 Records

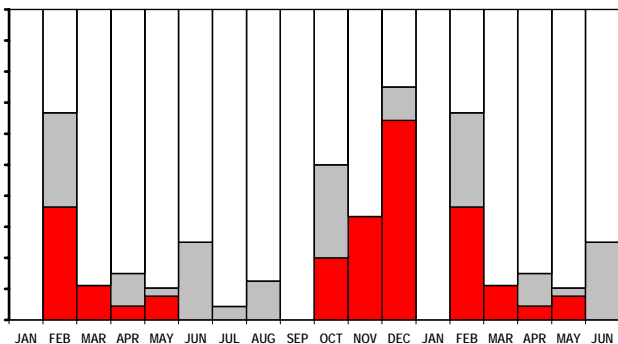
**Population** (375 records): 16% Common, 51% Frequent, 33% Rare.

**Dispersion** (310 records): 81% variable, 18% clumped, 0.6% evenly distributed.

**Flowering** (376 records with: Jan 2, Feb 66, Mar 9, Apr 67, May 80, Jun 17, Jul 46, Aug 8, Sep 6, Oct 41, Nov 6, Dec 28): Buds from Apr to Jul and Dec; Flowering from Nov; Peak Flowering not significant from Sep; Over not significant; Fruit from Jun to Feb and Apr; Nothing from Feb to Apr, Jun to Jul and Oct to Dec. Peak levels at 54% in Dec. Historically recorded as flowering from Nov to Jan with a Dec peak.



**Growth** (372 records with: Jan 2, Feb 66, Mar 9, Apr 67, May 78, Jun 16, Jul 46, Aug 8, Sep 6, Oct 40, Nov 6, Dec 28): Much from Oct to Feb; Rare from Feb, Jun and Oct; None from all year round. Peak levels at 75% in Dec.



**Seedlings** (135 records): Absent in 97%; fewer seedlings than prefire adults in 2 cases. Seedlings found in May and Dec.

**Fire Survival** (19 records): 84% resprouted from underground boles, 11% escaped fires in fire-safe areas, 5% survived by seedlings only.

**Age to first flowering:** First flowers reliably recorded at 100% at 9 years, earlier data too sparse.



**Height** (374 records): 87% 0-0.2 m tall, 13% 0.2-1 m tall.

**Pollinators** (2 records): 100% mammals.  
**Detailed Pollinators:** No additional data.

### Habitat:

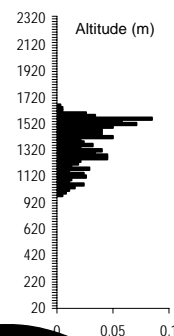
**Distance to Ocean** (378 records): 100% inland - further than 2 km from coast.

**Altitude** (378 records): 860 - 1560 m; 1140 *lq* - 1280 *med* - 1400 *uq*m.

**Landform** (372 records): 63% deep soil, 36% shallow soil, 0.5% rocky outcrops.

**Slope** (373 records): 44% gentle incline, 32% steep incline, 16% hill top, 5% platform, 2% valley bottom.

**Aspect** (307 records): 52% South, 19% East, 18% North, 11% West.

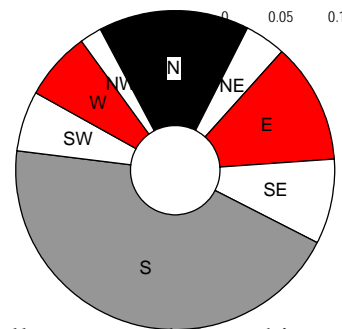


**Soil Type** (370 records): 35% loamy, 28% sandy, 18% gravelly, 14% rocky, 4% clayey.

**Soil Colour** (369 records): 51% brown, 25% grey, 9% orange, 7% yellow, 6% red, 2% white.

**Geology** (338 records): 70% sandstone, 30% shale, 0.6% Tertiary sands.

**Vegetation** (373 records): 100% shrubland.



### Conservation Status and Threat:

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 2 535 km<sup>2</sup> with 5% conserved and 3% lost; **Occupancy:** 417 km<sup>2</sup> with 5% conserved and 1% lost. **Fragmentation index:** 7%.

**Nature Reserves** (378 records): 7% in nature reserves - inadequately conserved.

**Habitat destruction** (373 records): 97% extensive natural habitat, 2% naturally linear habitats.

**Alien Invasive Species** (370 records): 98% none, 2% *Pinus*.

**Alien Density** (370 records): 98% alien-free, 2% sparse.

### Cultivation & Utilization:

**Picking** (276 records): 100% no sign of picking.



**Cultivation Status:** No noted cultivation.  
**Witch's Broom Infestation:** 8 records (2%).

**Atlassers Notes:**

One plant had a flower (LYM99072403);  
Got broad leaves up to 10mm  
(VDW97040304);  
Heavily grazed by ? (AGR96121309); Well  
grazed - by buck? (WIJ96121403);  
Huge clumps (VCH99072406);

**Confusing Species:** Misidentified as *P. restionifolia*, *piscina* and *scabra* (all of which have rough, not smooth, leaves). Also as *P. scolopendriifolia* which has leaves with stalks and blades and pointed involucral bracts. Curiously, while lots of *P. laevis* were confused with *P. revoluta*, the converse was not found, presumably as rolled leaves were treated as a diagnostic feature and any

specimens with indistinctly rolled leaves were assigned to *P. laevis*. Rourke states that they are easily mistaken for retios, but there is no way of quantifying how often this mistake was made.

Records of identification queries = 12.

Records of corrected identification queries = 5.

**Variation and Taxonomy:** No variation formally noted, but Rourke mentions that broader-leaved variants might be confused with *P. laevis*.

**Distribution:** Add.

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*Protea glabra* Thunb. 1781  
**Clanwilliam Sugarbush**  
*Kaiingsuikerbos*

**Other Common Names:** Brownsel Sugarbush, Chestnut Sugarbush, Scented Protea, *Bierbos*, *Kaiingbos*, *Kaiinghout*, *Kayang Sugarbush*, *Kreupelwaboom*, *Krukkelwaboom*, *Kruppelwaboom*.

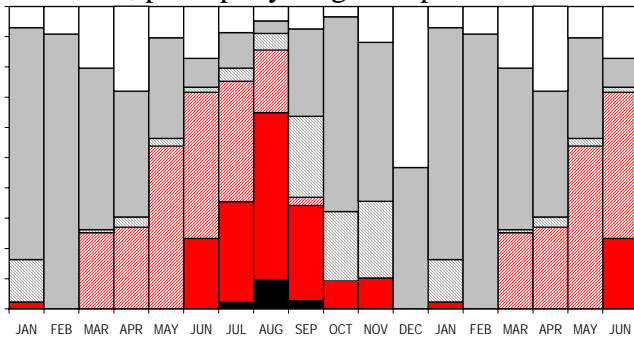
**Other Scientific Names:** *banksii* Kotsch ex Meisn 1856, *buekiana* Meisn 1856, *pyrifolia* Buek ex Meisn 1856, *thunbergii* (Endl) 1847.

**1094 Records**

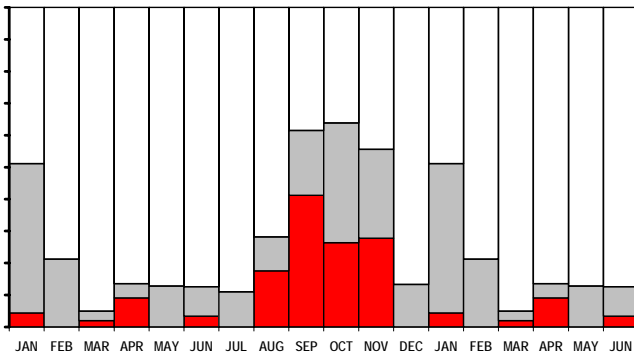
**Population** (1088 records): 21% Common, 59% Frequent, 20% Rare.

**Dispersion** (984 records): 67% variable, 31% clumped, 1% widespread.

**Flowering** (1058 records with: Jan 43, Feb 33, Mar 103, Apr 89, May 39, Jun 116, Jul 93, Aug 145, Sep 149, Oct 174, Nov 59, Dec 15): Buds from Mar to Aug; Flowering from Jun to Sep 32; Peak Flowering from not significant; Over from Sep to Nov; Fruit from Sep to May; Nothing from Mar to Apr and Dec. Peak levels at 91% in Aug. Historically recorded as flowering from Jul to Nov, principally Aug to Sep.



**Growth** (1050 records with: Jan 45, Feb 33, Mar 102, Apr 88, May 39, Jun 119, Jul 91, Aug 142, Sep 148, Oct 174, Nov 54, Dec 15): Much from Sep to Nov; Rare from Sep to Feb; None from all year round. Peak levels at 64% in Oct.



**Seedlings** (422 records): Absent in 99%: fewer seedlings than prefire adults in 3 cases. Seedlings found in Jan (2) and Sep.

**Fire Survival** (24 records): 63% escaped fires in fire-safe areas, 21% resprouted from underground boles, 8% eliminated from the area by fires, 8% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2 years, and 100% recorded at 3 years.



**Height** (1076 records): 6% 0.2-1 m tall, 45% 1-2 m tall, 48% 2-5 m tall, 1% taller than 5 m.

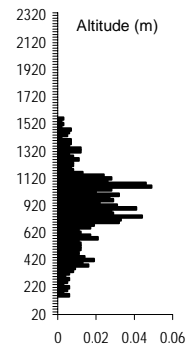
**Pollinators** (58 records): 74% beetles, 10% birds, 10% bees or wasps, 3% flies, 2% butterflies or moths.

**Detailed Pollinators** (17 records): Monkey Beetle (4), Southern Double-collared Sunbird (2), Malachite Sunbird (2), Honey Bee (2), Green Stripy Beetle (2), Great Protea Beetle (2), Orange-breasted Sunbird, Green Monkey Beetle, Green Beetle.

**Habitat:**

**Distance to Ocean** (1078 records): 100% inland - further than 2 km from coast.

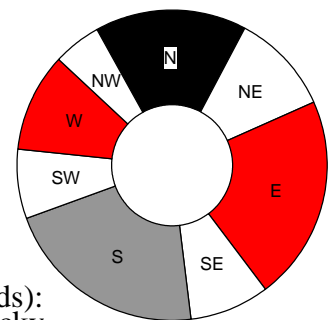
**Altitude** (1078 records): 140 - 1460 m; 620<sub>lq</sub> - 800<sub>med</sub> - 960<sub>uq</sub>m.



**Landform** (1068 records): 47% shallow soil, 45% deep soil, 7% rocky outcrops.

**Slope** (1072 records): 62% gentle incline, 15% platform, 13% hill top, 7% steep incline, 3% valley bottom.

**Aspect** (840 records): 31% East, 29% South, 23% North, 17% West.



**Soil Type** (1063 records): 59% sandy, 26% rocky, 7% loamy, 7% gravelly, 1% clayey.

**Soil Colour** (1054 records): 37% brown, 29% grey, 12% yellow, 9% white, 8% orange, 5% red.

**Geology** (1031 records): 95% sandstone, 3% shale, 2% silcrete or ferricrete.

**Vegetation** (1072 records): 99% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 6 943 km<sup>2</sup> with 13% conserved and 11% lost; Occupancy: 1 278 km<sup>2</sup> with 17% conserved and 8% lost. Fragmentation index: 12%.

**Nature Reserves** (1078 records): 19% in nature reserves - inadequately conserved.

**Habitat destruction** (1058 records): 77% extensive natural habitat, 12% islands, 9% naturally fragmented habitats, 1% naturally linear habitats.

**Alien Invasive Species** (1049 records): 91% none, 4% Fabaceae (chiefly alien *Acacia*), 4% *Pinus*.

**Alien Density** (1048 records): 91% alien-free, 7% sparse.

**Cultivation & Utilization:**

**Picking** (693 records): 100% no sign of picking.

**Cultivation Status:** Plantings - 1 record (0.09%).

**Witch's Broom Infestation:** 75 records (7%).

**Atlassers Notes:**

**Size**

One plant over 8m tall spectacular, within 20m of it was a creeping form lying prostrate on rock up to 1m diam.- flowerhead typical! (AGRY0012934);

Some gigantic (AWA96082101);

Also many plants of height 2 and 3 - an age spread? (TLE97101106) ; Quite a few young plants - older plants very old with old thick stumps (WMP97100401);

**Flowering**

Its usual self this time of the year with everything from nothing to cone (AWA98082703); Some bushes had buds flowers and new growth all together (JAT97083002);

All buds (some quite large) aborted (AGRY0092916); All buds dead (SAS99042602); Most have buds which have totally dried up (WIJ94041404);

**Forms and hybrids**

1 plant seen with very large leaves -almost *P. laurifolia* like -but typical *glabra* flowerheads (AGRY0103136);

**Growth**

New growth on small plants (AWA96082007, AWA97082702); Many young with new growth (AWA97082201);

**Stress and mortality**

Dying! Of which seven are 'non-seedlings' (AWA95082608); Looked stressed (AWA96082002); Experiencing water stress (SHRY0070901); Many dying - drought? (WIJY1031713); Almost half of seen were dead (AGRY0102606);

**Utilization**

Some chopped down - for firewood? (AGRY5122905);

**Pollination**

As always has this longish green striped (really ridged on elytra) beetle (AGRY0092315); Slender green beetle (AWA95081605); A small green longish beetle shiny with stripes lengthwise down its wing covers (OUT97092104); A lot of beetles on open flowers (SMS98091401);

**Habitat**

Lots of very young plants next to edge of seepage (AWA99091804); Increasing in the sand! (AWAY0101501);

Some in deep sand between rocks! (AGRY4041707); In sandy soil: seems suspicious! (AWA97082604); Crazy plants on sand with not a rock bed in sight (AWA98082805);

Always on thinner soils or solid rock (AGR92082701-3); Grow in what seems solid rock (JAT94111803); Almost exclusively on plateau with solid bed-rock (WIJ94041402); On rocky slabs (PMRY0100105, WIJY1031704); Grow only in the cracks of the sandstone bedrock (PVR94082901); Many grow out of cracks in rocky escarpment (WIJ93082703); Grows out of cracks in solid bedrock in level areas (WIJ94041205); On rocks (SGAY1022406-7; SGAY1022509, TLE98111707); Concentrated on rocky areas with shallow soils (SGAY1022510); Confined to rocky areas (SHR95052701-2, SHR95061802 WMPY2051201); Confined to rocky outcrop (TLE97101203, TLEY0052001); On rocky outcrops (TLEY0052005, TLEY0052102-3, TLEY0092302-3+06-7); Growing on cliff face (TLEY0052104, TLEY0092401);

**Witches Broom**

5-10% of plants dead with Witches Broom (AGRY0012940);

Very heavily infested (WMP97100401); Heavily infested (LYM99072502, PGD93091801, SAS99042403, SAS99042503, SAS99042603, VCH99072502); Occasional (SMRY0050602); On one plant (SMR98082704); Covered and not very healthy (VCH98082705); No Witches Broom - unusual! (WMP99042503);

Devils Growth (AWA96082203);

**Confusing Species:** None noted.

Records of identification queries = 9

**Variation and Taxonomy:** No variation noted.

**Distribution:** Add.

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*Protea inopina* Rourke 1978  
**Large-nut Sugarbush**  
*Stompiewaboom*

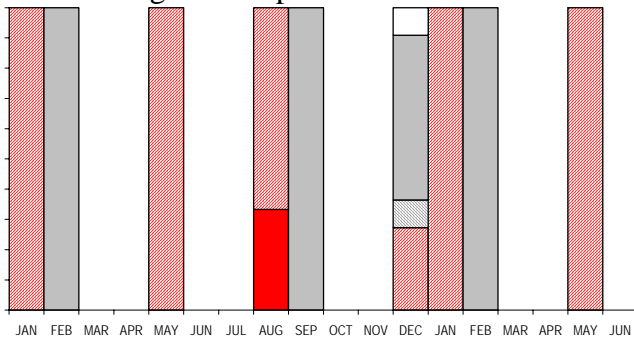
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**21 Records**

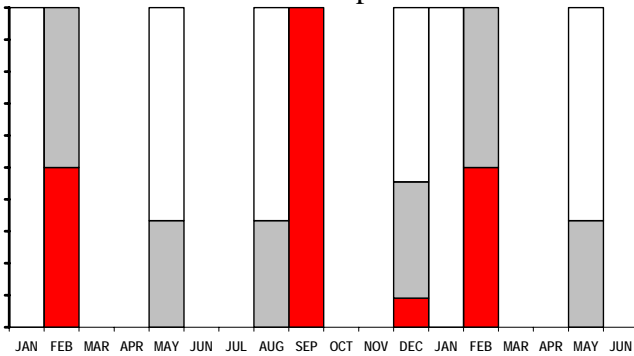
**Population** (19 records): 11% Common, 63% Frequent, 26% Rare.

**Dispersion** (19 records): 53% variable, 42% clumped, 5% evenly distributed.

**Flowering** (21 records with: Jan 1, Feb 2, Mar 0, Apr 0, May 3, Jun 0, Jul 0, Aug 3, Sep 1, Oct 0, Nov 0, Dec 11): Buds from Dec to Jan and May and Aug; Flowering from Aug; Peak Flowering not recorded; Over not significant; Fruit from Sep to Feb; Nothing not significant. Peak levels unreliable at 100% in Aug. Historically recorded as flowering from Sep to Dec.



**Growth** (21 records with: Jan 1, Feb 2, Mar 0, Apr 0, May 3, Jun 0, Jul 0, Aug 3, Sep 1, Oct 0, Nov 0, Dec 11): Much from Feb and Sep; Rare from Feb, May, Aug and Dec; None from Dec to Jan, May and Aug. Peak levels unreliable at 100% in Sep.



**Seedlings** (9 records): All without any seedlings present.

**Fire Survival** : No data.

**Age to first flowering:** Data only recorded at 100% at 7 years.



**Height** (21 records): 5% 0-0.2 m tall, 90% 0.2-1 m tall, 5% 1-2 m tall.

**Pollinators** (1 record): 100% beetles.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (19 records): 100% inland - further than 2 km from coast.

**Altitude** (19 records): 560 - 760 m; 620<sub>lq</sub> - 660<sub>med</sub> - 680<sub>uq</sub>m.

**Landform** (19 records): 63% deep soil, 21% shallow soil, 16% rocky outcrops.

**Slope** (19 records): 79% gentle incline, 21% steep incline.

**Aspect** (18 records): 44% North,

36% East, 11% South, 8% West.

**Soil Type** (19 records):

58% sandy, 37% loamy, 5% gravelly.

**Soil Colour** (19 records):

63% brown, 26% grey, 5% white, 5% orange.

**Geology** (18 records): 94% sandstone, 6% conglomerate.

**Vegetation** (19 records): 100% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable D2(i,ii).

**Occurrence** (Fynbos): 6 km<sup>2</sup> with 0% conserved and 9% lost; **Occupancy:** 9 km<sup>2</sup> with 0% conserved and 12% lost. Fragmentation index meaningless.

**Nature Reserves** (19 records): 5% in nature reserves - inadequately conserved.

**Habitat destruction** (19 records): 79% extensive natural habitat, 21% islands.

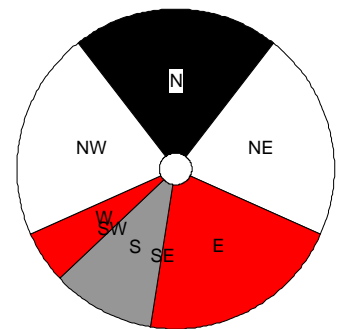
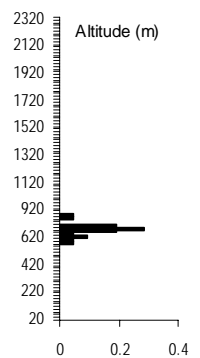
**Alien Invasive Species** (17 records): 100% none.

**Alien Density** (17 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (17 records): 94% no sign of picking, 6% lightly picked.

**Cultivation Status:** Plantings - 2 records (10%).



**Witch's Broom Infestation:** 4 records (19%).

**Atlassers Notes:**

**Damage**

Most buds do not mature and ends of stems all withering bark (CAR93080801);  
All badly damaged by insects, leaves also badly damaged (CAR93080801);

**Numbers**

Approx 50 plants seen (LYM98120507);  
Probably 100-150 adults (NAH92081512);

**Confusing Species:** None noted.  
Records of identification queries = 1.

**Variation and Taxonomy:** None recorded.

**Distribution:** Add.

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*Protea nitida* Miller 1768

Wagon Tree

Waboom

**Other Common Names:** Large-flower Erodendrum, Proud Protea, Tree Protea, Wagon Tree Sugarbush, *Wagenbaum*, *Blousuikerbos*, *Bobbejaansuikerbos*, *Brandhoutsuikerbos*, *Kaapwaboom*, *Adlunge* (Xhosa), *isAdlunge* (Xhosa).

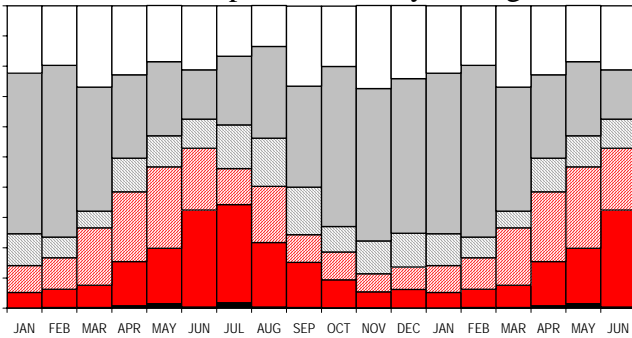
**Other Scientific Names:** *arborea* Houtt 1775, *grandiflora* Thunb 1781, *marginata* Lam 1791, *reticulata* Thunb 1803.

**9461 Records**

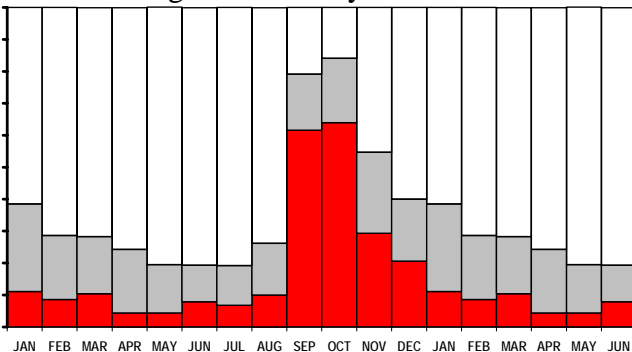
**Population** (9394 records): 26% Common, 59% Frequent, 14% Rare.

**Dispersion** (8731 records): 71% variable, 19% clumped, 8% widespread, 1% evenly distributed.

**Flowering** (9132 records with: Jan 573, Feb 588, Mar 843, Apr 666, May 673, Jun 529, Jul 563, Aug 958, Sep 858, Oct 1223, Nov 1141, Dec 517): Buds from Apr to Jun; Flowering from Jun to Aug; Peak Flowering and Over insignificant; Fruit from Jul to May; Nothing from Sep to Apr. Peak levels at 63% in Jun. Historically recorded as flowering erratically throughout the year, with a distinct peak from May to Aug.



**Growth** (9075 records with: Jan 576, Feb 581, Mar 843, Apr 657, May 664, Jun 516, Jul 547, Aug 956, Sep 863, Oct 1220, Nov 1137, Dec 515): Much from Sep to Dec; Rare from Oct to Feb; None from Nov to Aug. Peak levels at 84% in Oct. Historically recorded as in new growth in early summer.

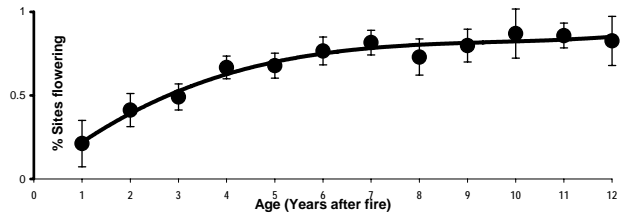


**Seedlings** (3583 records): Absent in 93%: fewer seedlings than prefire adults in 96 cases, and more in 24 cases. Seedlings found in Jan (19), Feb (2), Mar (15), Apr (3), May (9),

Jun (5), Jul (9), Aug (21), Sep (7), Oct (5), Nov (17) and Dec (8).

**Fire Survival** (902 records): 76% resprouted from aerial trunks, 12% escaped fires in fire-safe areas, 11% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 3 years, and 100% recorded at 14 years, with a decline after 21 years.



**Height** (9365 records): 7% 0.2-1 m tall, 37% 1-2 m tall, 53% 2-5 m tall, 2% taller than 5 m.

**Pollinators** (135 records): 64% birds, 15% bees or wasps, 11% beetles, 5% flies, 3% none observed, 0.7% mammals, 0.7% butterflies or moths.

**Detailed Pollinators** (97 records): Cape Sugarbird (47), Orange-breasted Sunbird (16), Malachite Sunbird (12), Southern Double-collared Sunbird (5), Honey Bee (3), Great Protea Beetle (3), Wasp (unspecified) (2), Solitary Bee (2), Red-winged Starling (2), Cape White-eye (2), Scarab Beetle, Monkey Beetle, Genet.

**Habitat:**

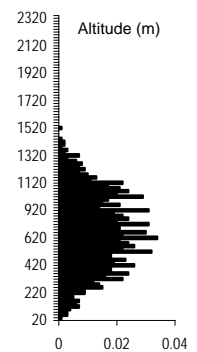
**Distance to Ocean** (9291 records): 95% inland - further than 2 km from coast.

**Altitude** (9293 records): 20 - 1900 m; 440 *lq* - 640 *med* - 840 *uq*m.

**Landform** (9263 records): 64% deep soil, 29% shallow soil, 6% rocky outcrops, 1.0% riverine.

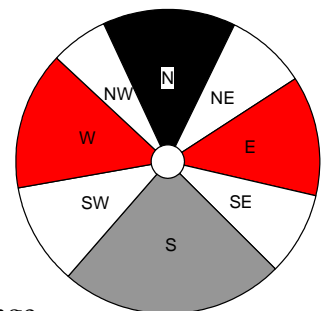
**Slope** (9265 records): 44% steep incline, 44% gentle incline, 4% hill top, 4% platform, 2% valley bottom, 2% cliff.

**Aspect** (8487 records): 34% South, 24% West, 21% East, 21% North.



**Soil Type** (9157 records): 49% sandy, 27% loamy, 12% gravelly, 9% rocky, 4% clayey.

**Soil Colour** (9116 records): 52% brown, 32% grey, 6% orange,



3% yellow, 3% white, 2% red, 1% black.  
**Geology** (9051 records): 81% sandstone,  
11% shale, 6% granite.  
**Vegetation** (9259 records): 97% shrubland,.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.  
Occurrence (Fynbos): 41 366 km<sup>2</sup> with 22%  
conserved and 18% lost; Occupancy:  
7 697 km<sup>2</sup> with 30% conserved and 12%  
lost. Fragmentation index: 6%.  
**Nature Reserves** (9293 records): 38% in nature  
reserves.

**Habitat destruction** (9100 records):  
90% extensive natural habitat, 6% islands,  
3% naturally linear habitats.

**Alien Invasive Species** (8934 records):  
59% none, 16% *Pinus*, 11% Fabaceae  
(chiefly alien *Acacia*), 11% *Hakea*,  
2% Myrtaceae.

**Alien Density** (8899 records): 59% alien-free,  
33% sparse, 7% abundant, 2% dense.

**Cultivation & Utilization:**

**Picking** (6189 records): 100% no sign of  
picking, 0.3% lightly picked, 0.0% severely  
picked.

**Cultivation Status:** Plantings - 17 records  
(0.2%).

**Witch's Broom Infestation:** 250 records (3%).

**Atlassers Notes:**

**Habit**

Smaller plants here than lower - not reaching  
tree status at upper end of altitude  
(AGR95040530); Uppermost on slope all  
dwarf - giants lower down (AGRY4092404);  
Many size 4 also very knee- to waist high  
(CVV99022801);  
Also height class 2 as well as HC 5 - coded as  
dwarf form but not accepted - dwarf ecotype  
does not co-occur with tall plants  
(DOA93112907);

**Size**

Lots > 5m tall (AGR95110807); These are  
some of the biggest I have seen  
(AKS94091301); Single very large plant  
growing in cleft of plateau - very old  
(OUT97092105); Some extremely large -  
approx 5m tall and 250mm dbh  
(SGAY1011704); The tallest specimens in  
our area (VJK94060506);

**Flowering**

The pollinator contradicts the flowering state  
but there was one tree in beautiful bloom the  
others mainly seedheads (AWA94082401);  
One plant in full bloom - the exception  
(AWA96081109); Flowering was very  
sparse (CVV97032705+6); Only one or two  
with buds and flowers (CVV99022801);  
Some plants in flower but less than 10%  
(HCE96062201); About 2% of plants are in  
flower still and only about 10 flowerheads  
are in bud (HCE96080405); Actually 2  
flowers in the population - mostly nothing  
(JAT99051601);

The closer we came the more I realized very  
few of them were in flower - it was just new  
growth (AWA95101015);

Some aborted buds (COJ97032301); Lots of  
aborted buds (PVR94072807);

Though most flowers are over there is a second  
flush of buds on some bushes  
(CVV96102501); Was without flowers  
whereas in areas round about flowers were  
abundant, perhaps the plants in the burnt area  
saved their energy for growth only  
(JAT92052901);

**Fire survival:**

Tall plants burned flat to ground  
(AGRY1103116); All - even big trees -  
burned right down to the ground - cannot  
cope with fire in the open - only in rocks!  
(AGRY3112508); Some plants killed by fire  
higher up slope (OUTY0102206); Seem to  
have escaped the fire on steep cliffs  
(OUTY1031006); The plants here were not  
protected by the rocks and burned in the last  
fire which is why they are so much lower  
than on the previous plot (PVR94112403);  
A great plant survived the fire (AJAY0033004);  
Majority are trees with single stems but some  
have resprouted as multiple stems  
(AKS93060904); Poor recovery after fire but  
growing from trunk (AKS93102312); In all  
sizes and stages (AWA98090202); Many  
small plants - complete with "trunking"  
(AWAY0102206); This area not as badly  
damaged by the fire and many plants  
surviving (JAT93082803); Only a few  
resprouting plants left in this area  
(JAT93082901); Only sign of fire was  
blackened trunks which have regenerated  
extremely well (JAT95082701); Some plants  
destroyed by the fire (JAT96022501); All  
resprouting after fire (LYM94110101); All  
of these killed by fire standing at 4 height - at  
least 5 height (OUTY0102207); Evidence of  
a hot fire; some plants killed  
(PMR98120505); Mostly tall burnt trunks (ht  
4 ) with sprouting ht 2 or 3 from near base of  
trunks (SMR97112605); Most of the height 4  
plants survived the fire in this area  
(TLE94082805); Some survived from trunk  
some apparently from bole (TLEY0112608);  
Many young plants from seedlings not  
resprouting (WIJ92032802); Many plants  
dead - no sign of resprouting after nearly 4  
yrs (WMP98120602);  
1/2 plants killed in last fire! (AGR99032620);  
Some resprouting from ground - others are big  
trees (WIJ94040905);  
Many of previous island population (of about  
100 plants ) destroyed have not flowered yet  
before fire (EAH95043001); Many dead  
burnt plants (JAT93082804);

**Parent seedlings ratios**  
*Protea laurifolia* had poor recruitment and *P.*  
*nitida* very good recruitment  
(SGAY1022001); Big trees - many killed but  
many young plants coming up - first time  
seen so many killed (VCH98041205);  
Young could be in majority (AWA97082604);  
Lots of babies (AWA97090902,  
AWA98091102, AWA99092601-2  
AWA99100603, AWAY0102006,  
AWAY0102204); Many young  
(AWA97091001, AWAY0101803,  
CVV97032104); Young outnumber older  
ones (AWA97091402); Many adults but  
more small ones (AWA98090701,  
AWAY0102207); Forest of old waboom  
with lots of young ones (AWA98091305);



Many small plants below big trees (CVV97032706); There were more seedlings than parents (PVR92032905);

#### **Variation**

Broad grey leaves - not dwarf (AJT93103108); A rather sprawling habit (CJL98062501);

#### **Leaf growth**

On Piketberg This year - very bad beetle (snout?) attack of leaves - pellet like bits chewed out of hardening leaves! (AGR96111704); Leaves eaten along edges (LKAY0080703);

Severely damaged by rust (fungus) (AMMY3112527-29); Small patches are tatty and have black patches on leaves - none of these have buds or new growth (PAP94071701); A few plants had nearly all leaves polka dotted with black (fungal?) circles diameter 5-10mm (SMRY0101904);

Galls on branches (WEL94080601); Some new growth killed and burned by recent hot wind (AKS92110401); Some die-back of upper leaves (PMRY0111101);

New shoot growth due to unusual good rains this time of year (DOA95060302-3);

#### **Symbionts**

Two ground woodpeckers roosting in trees - apparently juveniles (AGRY0010703); This plant had very clear leopard scratchings on trunk (SSA92081501);

#### **Use**

Many have been and are being cut for firewood (BRBY0092302); Being used for firewood (ROO94080801); One chopped down (VJKY0030102);

#### **Mortality**

Almost as many dead as alive (AGRY0042823); Summer 98 / 99 severe drought killed even mature plants in vicinity (EAH99092501); Dying (GEH94010803); Several plants dying of drought (WIJ94041308)

#### **Pollination**

The Lesser Double Collared Sunbird and Cape White-eye moved through the plants in a mixed flock of 6 and 10 birds respectively at 08h00 and flew on amid much activity (AGRY2040601);

Indigenous ants found in the flowerheads (GNIY1032904);

Ants visiting old flowerheads (GNIY1032905);

#### **Distribution**

Exclusively at top - all other species increasing in density lower down (AGRY4092408); Surviving in a gully amongst dense aliens (CVV95021703);

Occurs mainly in the rockier areas which are fire safe - not found on open slope and quite common right into scree forests edges (GNIY1032905); Ubiquitous on slopes either side of Welbedacht Kloof grows amongst *Widdringtonia cederbergensis* but upper limit of its distribution appears to be about 1300m (MHO93030702); Restricted to protected areas (in gullies) here, but is widespread elsewhere in seepage or protected areas (PGD93091801); Concentrated in and around gullies - somewhat older plants compared to neighbouring plants (CJL98062503);

Mainly on butt side "walls" (AJT93090803); Hugging rocky slopes (AWA95081606); At

edges of rocky outcrops (PMR94120201); Just below rocky outcrops (PMR96081006); Clumped near rock "band" (AKS92061202); Near rocks (AWA95081702, AWA95081802-3); Growing near a rocky outcrop which was unburnt (MHO93031001); Only near rocks (AWA95081903); Confined to rocky outcrops (SGAY1022105, SGAY1022509); Rocky outcrops (PMR94120203, PMR96111703, PMR98040402); On sandstone outcrop (PMRY0121401); Encircling valley at foot of steep slopes (AWA95081902); Confined to ravine (GYC93091703-4, SHR95110101); Mainly in gorge (TLE97101802); Growing in the valley as well as on the slopes (LYM98100208); On rocky screes at edge and going up the hill sides (MVB99090801); Mainly on rocky slopes (TLE98111710); Clumped across the bottom of the steep cliff (PAP92090904); A few plants clinging perilously to edges on these spectacular cliffs (PVR90010805); Just below top of ridge in rocks (SGAY0122813); Clumped along ephemeral watercourses (SHRY4062002-3); Mostly high up on cliff and as it levels off on kloof (TLE97092303);

#### **Witches Broom**

Lots of witches broom killed in past fire - only a few trees with infection now (AGR96052608); Witches Broom has not recovered from fire (JAT92052901); Mostly on plants in rocky outcrops and adjacent forest clumps (AGRY0042405); Much where vegetation lush and more sheltered (JAT96041905);

On many plants (JAT92102901, JCY97061501, SMRY1011705); Lots (WMPY1111702); Frequent (HCE96080501+2, SMR97011603); Occasional (JAT96041901-3 6); some plants (LYM98011803, OUT97052403, SMRY0111507, SMRY1011702, SMRY1011713); On few plants (JAT96040401); On about 2% of plants (HCE96080405); Rare, but present (HCE96080609); On 2 plants (SHS97020502); On one plant (SHR97121407, SMR97011604, SMRY0030903, TLEY0043003, TLEY0043012, VJKY0030102); Plants are full (MEL96041701), Much (SMR97021201, SMR98112501, SMRY0030910); Heavy infestation (SMR99060303, SMRY0030908); in excess (WIJY0081904); 5 or 6 plants infested, including young plant about 1m high (MCG96060803); On one plant - it had killed off a 300mm long branch (NGF96040703); On one of the 2 plants (SMRY1011709);

**Confusing Species:** Mostly mistaken with dwarf form, but also rare instances of *P. obtusifolia* and *P. lorifolia*.

Records of identification queries = 27

Records of corrected identification queries = 9 .

**Variation and Taxonomy:** For such a widespread species, surprisingly constant. Inflorescences are usually creamy-white to green, but occasionally solitary deep pink

forms are encountered (recorded from south Cedarberg. Banhoek, Somerset West, Villiersdorp and Swellendam).  
The dwarf form is dealt with separately and can be considered a neotenic form: the plants are multi-stemmed resprouters with narrower oblong leaves with a greener olivaceous tint (not silvery or whitish-glaucous).

**Distribution:** Add.  
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## *Protea nitida dwarf* Miller Dwarf Wagon Tree

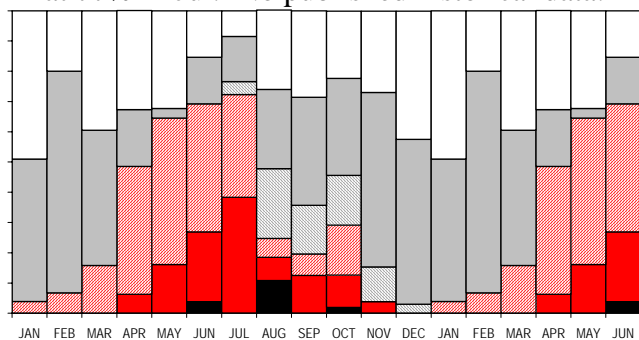
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

### 565 Records

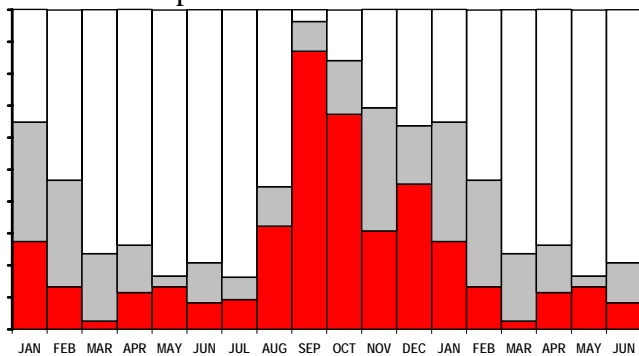
**Population** (564 records): 0.5% Abundant, 23% Common, 53% Frequent, 23% Rare.

**Dispersion** (501 records): 62% variable, 32% clumped, 5% widespread, 1% evenly distributed.

**Flowering** (555 records with: Jan 51, Feb 15, Mar 38, Apr 64, May 31, Jun 26, Jul 47, Aug 65, Sep 56, Oct 103, Nov 26, Dec 33): Buds from Apr to Jul; Flowering from Jun to Jul; Peak Flowering insignificant peaking in Aug; Over from Aug; Fruit from Aug to Mar; Nothing from Aug to May. Peak levels at 77% in Jul. No published historical data.



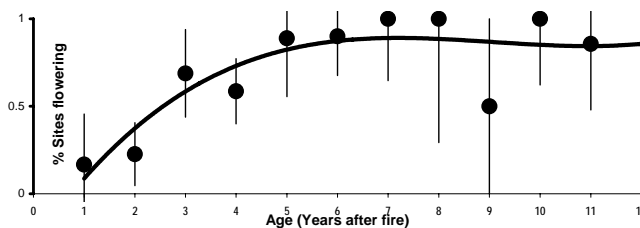
**Growth** (541 records with: Jan 51, Feb 15, Mar 38, Apr 61, May 30, Jun 24, Jul 43, Aug 65, Sep 54, Oct 101, Nov 26, Dec 33): Much from Aug to Jan; Rare from Jan to Mar and Nov; None from Nov to Aug. Peak levels at 96% in Sep.



**Seedlings** (238 records): All without any seedlings present.

**Fire Survival** (103 records): 83% resprouted from underground boles, 13% resprouted from aerial trunks, 2% survived by seedlings only, 2% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% recorded at 8 years, with only 33% flowering after 21 years.



**Height** (560 records): 1% 0-0.2 m tall, 73% 0.2-1 m tall, 26% 1-2 m tall, 0.2% 2-5 m tall.

**Pollinators** (2 records): 50% bees or wasps, 50% beetles.

**Detailed Pollinators** (1 record): Honey Bee.

### Habitat:

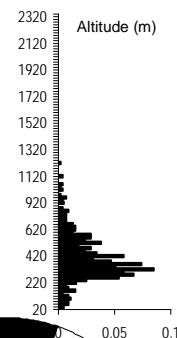
**Distance to Ocean** (551 records): 79% inland - further than 2 km from coast.

**Altitude** (551 records): 20 - 1120 m; 280 *lq* - 360 *med* - 420 *uq* m.

**Landform** (550 records): 85% deep soil, 10% shallow soil, 5% rocky outcrops.

**Slope** (549 records): 47% steep incline, 41% gentle incline, 5% hill top, 3% cliff, 2% platform.

**Aspect** (516 records): 45% South, 23% West, 17% North, 16% East.



**Soil Type** (550 records):

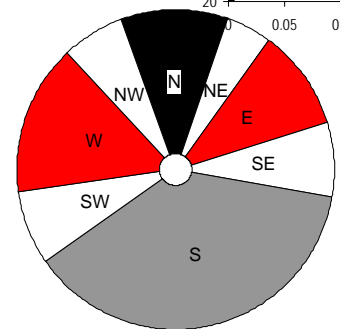
45% sandy, 41% loamy, 7% clayey, 4% gravelly, 3% rocky.

**Soil Colour** (549 records):

54% brown, 36% grey, 4% orange, 2% white, 2% yellow, 2% black.

**Geology** (546 records): 71% sandstone, 16% shale, 6% granite, 4% silcrete or ferricrete, 2% conglomerate.

**Vegetation** (550 records): 99% shrubland.



### Conservation Status and Threat:

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 7 332 km<sup>2</sup> with 24% conserved and 26% lost; **Occupancy:** 455 km<sup>2</sup> with 24% conserved and 17% lost. **Fragmentation index:** 3%.

**Nature Reserves** (551 records): 40% in nature reserves.

**Habitat destruction** (545 records): 91% extensive natural habitat, 7% islands.

**Alien Invasive Species** (531 records): 40% none, 29% Fabaceae (chiefly alien *Acacia*), 23% *Pinus*, 7% *Hakea*, 1% Myrtaceae.

**Alien Density** (528 records): 40% alien-free, 48% sparse, 9% abundant, 3% dense.

**Cultivation & Utilization:**

**Picking** (368 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 3 records (0.5%).

**Atlassers Notes:**

A few plants of the pr nitida with red flowers (FBH95083001);

Here just makes dwarf form. To east the plant are bigger but also flowering in branched form - probably due to larger surrounding plants in moist granite environment stops them becoming single stemmed trees when occ. burns (AGRY4050901);

New growth has all died (AGR97102509); Has green narrow twisted sessile leaves and would not be suitable to make wagons (VJK97082303);

**Confusing Species:** Atlassers often forgot to note which populations were dwarfs. Others

recorded young plants are dwarfs. Where possible these identifications were corrected. Records of identification queries = 105. Records of corrected identification queries = 49.

**Variation and Taxonomy:** None noted. The dwarf form differs from the tree form in that it is a multi-stemmed resprouter (not a single-stemmed tree), with narrower oblong leaves with a greener olivaceous tint (not silvery or whitish-glaucous). Juveniles of the tree form have typical leaves, but may remain resprouters until they become robust enough to survive a fire – they seldom flower until they become trees. The dwarf form was once regarded as a full species: *P. reticulata*, but this has not upheld in the latest revisions.

**Distribution:** Add.

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*Protea rupicola* Mund ex Meisn. 1856  
**Krantz Sugarbush**  
*Kranssuikerbos*

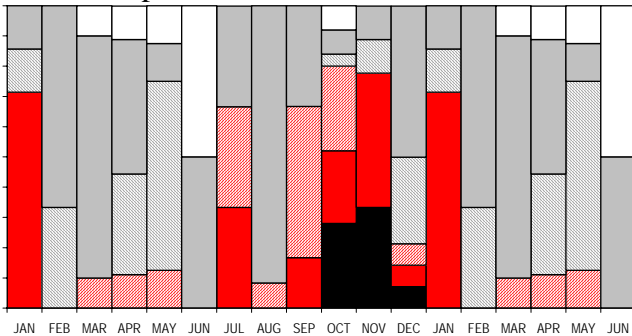
**Other Common Names:** Dyke's Sugarbush.  
**Other Scientific Names:** *dykei* Phill 1912,  
*saxicola* Marloth 1900.

**114 Records**

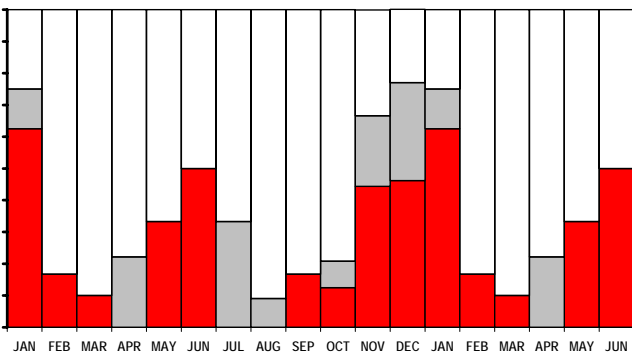
**Population** (111 records): 1% Common,  
 38% Frequent, 60% Rare.

**Dispersion** (92 records): 54% clumped,  
 35% variable, 5% evenly distributed,  
 5% widespread.

**Flowering** (111 records with: Jan 7, Feb 6, Mar 10, Apr 9, May 8, Jun 2, Jul 3, Aug 12, Sep 6, Oct 25, Nov 9, Dec 14): Buds from Jul and Sep to Oct; Flowering from Jan, Jul and Oct to Nov; Peak Flowering from Oct to Nov; Over from Feb, Apr to May and Dec; Fruit from Feb to Apr, Jun to Sep and Dec; Nothing from Jun. Peak levels at 89% in Nov. Historically recorded as flowering from Sep to Feb.



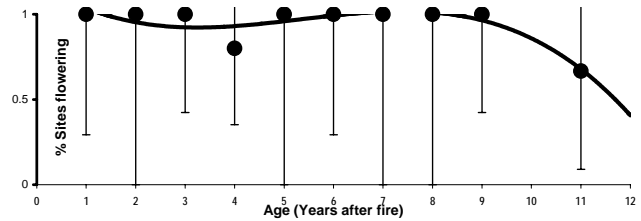
**Growth** (107 records with: Jan 8, Feb 6, Mar 10, Apr 9, May 6, Jun 2, Jul 3, Aug 11, Sep 6, Oct 24, Nov 9, Dec 13): Much from Nov to Jan and May to Jun; Rare from Apr, Jul and Nov to Dec; None from all year round. Peak levels at 77% in Dec.



**Seedlings** (35 records): Absent in 83%; fewer seedlings than prefire adults in 2 cases, and more in 1 case. Seedlings found in Jan (2) and Oct.

**Fire Survival** (13 records): 85% escaped fires in fire-safe areas, 15% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2 years, and 100% recorded at 3 years.



**Height** (111 records): 5% 0-0.2 m tall,  
 55% 0.2-1 m tall, 36% 1-2 m tall, 5% 2-5 m tall.

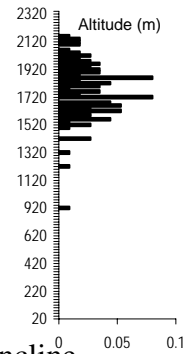
**Pollinators** (5 records): 80% birds,  
 20% beetles.

**Detailed Pollinators** (4 records): Orange-breasted Sunbird.

**Habitat:**

**Distance to Ocean** (113 records): 100% inland - further than 2 km from coast.

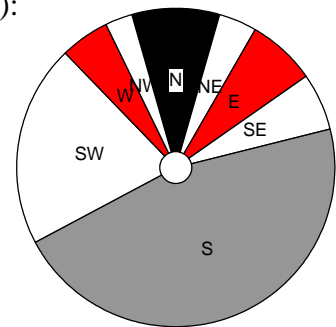
**Altitude** (113 records): 800 - 2060 m; 1520 *lq* - 1660 *med* - 1760 *uq*m.



**Landform** (111 records): 57% rocky outcrops,  
 35% shallow soil, 8% deep soil.

**Slope** (110 records): 51% steep incline,  
 31% cliff, 10% gentle incline, 7% hill top.

**Aspect** (102 records): 59% South,  
 18% West, 13% North,  
 10% East.



**Soil Type** (105 records): 42% sandy,  
 29% rocky, 27% loamy,  
 2% peaty, 1.0% gravelly.

**Soil Colour** (103 records): 64% grey,  
 17% brown, 16% black, 2% white,  
 1.0% orange.

**Geology** (108 records): 99% sandstone.

**Vegetation** (106 records): 95% shrubland,  
 5% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Eastern form:  
 Endangered B2a(i)b(iii,v); Western form:  
 Endangered B2a(i)b(iii,v), C2a(i), D.

**Occurrence** (Fynbos): 14 781 km<sup>2</sup> with 32% conserved and 7% lost; **Occupancy:** 189 km<sup>2</sup> with 73% conserved and 0% lost. **Fragmentation index:** 1%.

**Nature Reserves** (113 records): 73% in nature reserves - well conserved.

**Habitat destruction** (105 records): 88% extensive natural habitat, 6% islands,

4% naturally linear habitats, 3% naturally fragmented habitats.

**Alien Invasive Species** (98 records): 95% none, 4% *Pinus*, 1% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (97 records): 96% alien-free, 4% sparse.

**Cultivation & Utilization:**

**Picking** (85 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 1 record (0.9%).

**Atlassers Notes:**

**Size variation**

Main parent is HC 4 but surrounded by young plants of HC 2 (DFJ97040104); Younger plants around parent still doing well (DFJ99101001); Two size classes 4 and 2, one was 3-4m (DOA92091603); 2 height classes of 3 and 2 (DOA93022011); 1 large specimen HC 4 and 7 plants HC 2 - not flowered yet (JBB98043007); 2 largest appear dead, 5 are vigorous young plants about knee high, other 7 = chest high (MCG96081101); HC: 1 plant = 2 and 1 plant = 1 (WMP94123008);

**Fruit**

Although there were 5 old cones none of them contained any old flowers or seeds - just bare cones the plant also had very few leaves - just a few terminal tufts (NAH94043002);

**Fire survival**

A very interesting clump of very mature plants in a protected bowl on the peak summit plateau (DFJ95031902); Protected by rocky outcrops (DEB95051201); This spot is also protected from fire (DOA92091603); Growing in site very well protected from fire hence age of veld not applicable to this plant (DOA92102307); In rocks protected from fire and thus very old (DOA94092604); A single old woody plant in rocks protected from last fire (EGH99080602); Some were killed (DOA93022011); Also 1 dead (DOA94032905);

Killed in bloom spread against rock (OUT98050907);

Part of population [another 10 plants or so] burnt in last fire (APE92120511);

Very old (JBB98050109);

**Phenology**

The older trees have no new shoot growth but the younger plants had much shoot growth (DOA93022011);

**Numbers**

> 50 plants - a forest! (AGRY0021507);

Less than 20 plants seen - scattered along cliff face (AGRY5100109); Could only find the one plant - obviously very old: diam of stem 100mm from ground level about 150mm. (DOA92102307); One big plant with about 30 blooms (JBB99121706); 14 plants of which the 2 largest appear dead (MCG96081101); A 3rd plant was dead (WIJ96041009); 3 separate bushes seen (WMP93011607);

This is a reliable climber supported by a photograph and firm date of a spectacular and well known (to climbers) specimen just short of this high summit: Source Brian Hall (DFJ93111701);

**Habitat**

Scattered along cliff face (AGRY5100109); Plants scattered along rocky ridge more on the western aspect (JBB98050108); On western aspect (JBB99121803); Only at top of peak in between the rocks (JCJ97101901); Only on rocks (WMP93011607); Growing on rocky Woolworths Building (WMP94123005); Growing over rocky cliff (WMP94123006);

Quiet unexpected to find it growing here - should have been on top of Swartberg (DOA92091603);

**Confusing Species:** None noted. Expected a few confusions with Pincushions, but none materialized.

Records of identification queries = 3.

**Variation and Taxonomy:** Plants are frequently wind pruned and may grow in rock shelters or flat against rocks.

There is considerable variation in the size of the flowerheads, apparently related to vegetative vigour, ranging from 40mm to 90mm diameter on the same plant..

The pollen presenter varies from being capitulate (and regarded as a separate species: *P. dykei*) in the eastern and linear in the western forms.

**Distribution:** Add.

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***Protea angolensis* var. *angolensis* (Welw.) 1859**  
**Dwarf Northern-woodland Sugarbush**

**Other Common Names:** *chirapanzungu*, *isiqalaba* (*siNdebele*), *mubonda* (*central Shona*), *musitsuru*.

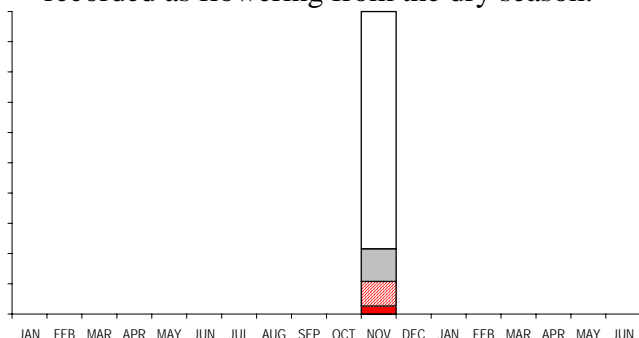
**Other Scientific Names:** *None*.

**39 Records**

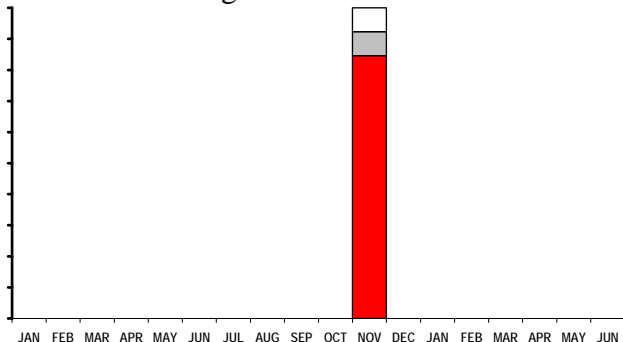
**Population** (39 records): 15% Common, 54% Frequent, 31% Rare.

**Dispersion** (32 records): 88% variable, 13% clumped.

**Flowering** (37 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 37, Dec 0): Nothing from Nov. Peak levels meaningless. Historically recorded as flowering from the dry season.



**Growth** (39 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 39, Dec 0): Much from Nov. Peak levels meaningless.



**Seedlings** (2 records): All without any seedlings present.

**Fire Survival** (3 records): 100% resprouted from underground boles.

**Age to first flowering:** No data.

**Height** (39 records): 3% 0-0.2 m tall, 97% 0.2-1 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (39 records): 100% inland - further than 2 km from coast.

**Altitude** (39 records): 1400 - 1940 m; 1560<sub>lq</sub> - 1600<sub>med</sub> - 1660<sub>uq</sub>m.

**Landform** (39 records): 95% deep soil, 5% swamp.

**Slope** (39 records): 54% gentle incline, 46% platform.

**Aspect** (17 records): 71% South, 24% West, 6% East.

**Soil Type** (39 records): 85% sandy, 15% loamy.

**Soil Colour** (39 records): 46% grey, 33% red, 10% brown, 10% orange.

**Geology** (39 records): 100% granite.

**Vegetation** (39 records): 41% grassland, 28% wooded grassland, 28% woodland, 3% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Distribution data inadequate.

**Nature Reserves** (39 records): 5% in nature reserves - inadequately conserved.

**Habitat destruction** (39 records): 77% extensive natural habitat, 13% road verges, 10% islands.

**Alien Invasive Species** (39 records): 67% none, 15% Myrtaceae, 15% other aliens, 3% *Pinus*.

**Alien Density** (38 records): 68% alien-free, 29% sparse, 3% abundant.

**Cultivation & Utilization:**

**Picking** (3 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

None found.

**Confusing Species:** None noted.

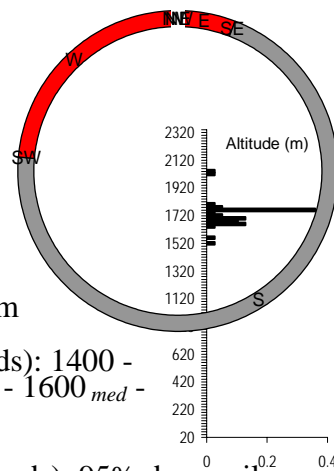
**Variation and Taxonomy:** This is the resprouting variety with white flowers.

**Distribution:** Add.

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*Protea angolensis* var. *divaricata* (Engl. & Gilg.) Beard 1903, 1963  
Northern Woodland Sugarbush

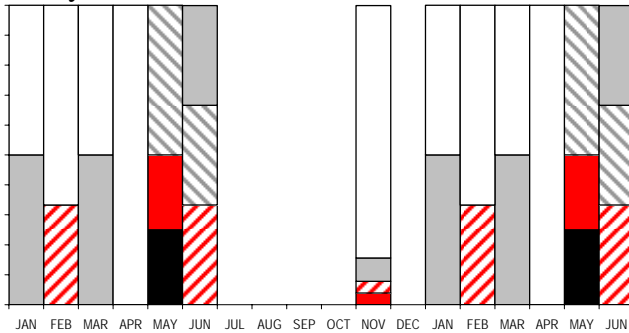
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**74 Records**

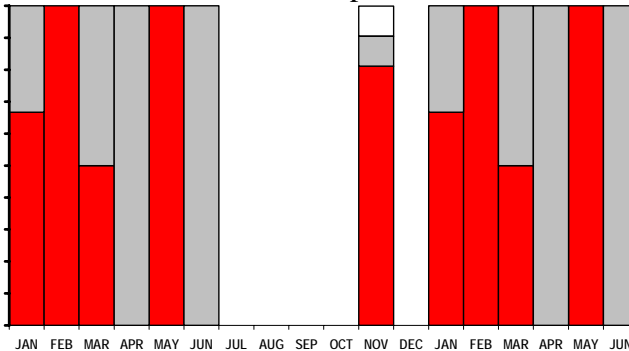
**Population** (74 records): 1% Common, 45% Frequent, 54% Rare.

**Dispersion** (49 records): 69% variable, 27% clumped, 2% evenly distributed, 2% widespread.

**Flowering** (66 records with: Jan 2, Feb 3, Mar 2, Apr 1, May 4, Jun 3, Jul 0, Aug 0, Sep 0, Oct 0, Nov 51, Dec 0): Buds from Feb and Jun; Flowering from May; Peak Flowering from May; Over from May to Jun; Fruit from Jan, Mar and Jun; Nothing from Nov to Apr. Peak levels unreliable at 100% in May. Historically recorded as flowering from the dry season.



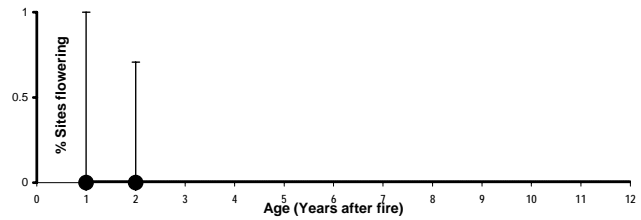
**Growth** (69 records with: Jan 3, Feb 3, Mar 2, Apr 1, May 4, Jun 3, Jul 0, Aug 0, Sep 0, Oct 0, Nov 53, Dec 0): Much from Nov to Mar and May; Rare from Jan, Mar to Apr and Jun; None not significant. Peak levels unreliable at 100% except in Nov.



**Seedlings** (14 records): Absent in 86%; fewer seedlings than prefire adults in 1 case. Seedlings found in Feb.

**Fire Survival** (20 records): 60% resprouted from aerial trunks, 35% escaped fires in fire-safe areas, 5% resprouted from underground boles.

**Age to first flowering:** Data inadequate: first flowers recorded at 21 years.



**Height** (73 records): 5% 0.2-1 m tall, 48% 1-2 m tall, 47% 2-5 m tall.

**Pollinators** (1 record): 100% bees or wasps.  
**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (73 records): 100% inland - further than 2 km from coast.

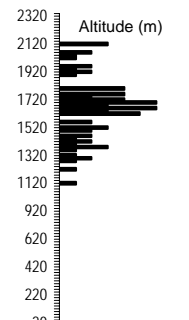
**Altitude** (73 records): 1000 - 2020 m; 1400 *lq* - 1560 *med* - 1600 *uq*m.

**Landform** (73 records):

95% deep soil, 3% shallow soil, 1% swamp, 1% rocky outcrops.

**Slope** (73 records): 53% gentle incline, 45% platform, 1% hill top.

**Aspect** (42 records): 37% East, 26% West, 19% North, 18% South.

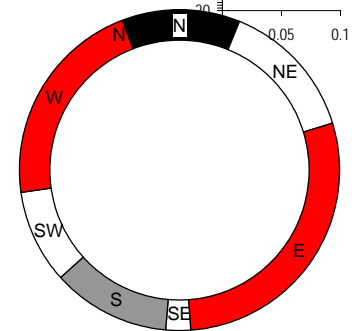


**Soil Type** (73 records): 53% sandy, 44% loamy, 3% clayey.

**Soil Colour** (71 records): 54% brown, 28% grey, 11% red, 4% yellow, 3% orange.

**Geology** (66 records): 98% granite, 2% basalt.

**Vegetation** (71 records): 58% woodland, 21% wooded grassland, 18% grassland, 3% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern. Occurrence data inadequate.

**Nature Reserves** (73 records): 14% in nature reserves - inadequately conserved.

**Habitat destruction** (69 records): 72% extensive natural habitat, 20% islands, 4% road verges, 3% naturally fragmented habitats.

**Alien Invasive Species** (72 records): 51% none, 24% other aliens, 15% *Pinus*, 8% Myrtaceae, 1% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (71 records): 52% alien-free, 45% sparse, 3% abundant.

**Cultivation & Utilization:**

**Picking** (27 records): 96% no sign of picking, 4% lightly picked.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

In the past there has been vigorous coppicing on the burnt area - none has reached tree size or flowered during several years of less than average rainfall - where there is wooded grassland they have flowered in the winter and grown normally (IBG93010101); They have grown well on both parts of this site - there are flowers on the plants in the firebreak (IBG93051001); Wood cutting - some limbs chopped off (IBG95040601); On one flowerhead a large paper wasp dug into the outer florets for a minute or two (IBG93051201);

Probably too much competition with grasses for seedlings - never seen any anywhere to date (IBG93052802);

**Confusing Species:** None noted.  
Records of identification queries = 3.

**Variation and Taxonomy:** This is the tree form, flower colour was not noted, so the form cannot be ascribed.

**Distribution:** Add.

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*Protea angolensis* var. *angolensis* forma *rosea*  
**Rose Woodland Sugarbush**

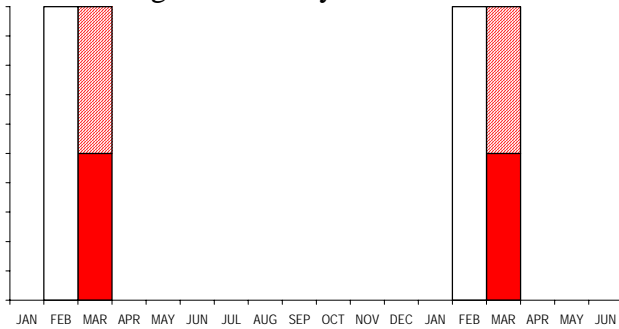
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**3 Records**

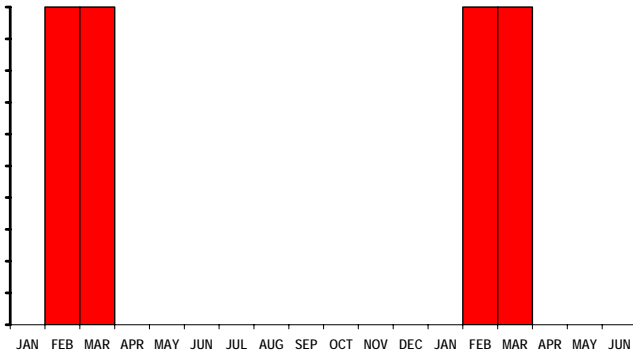
**Population** (3 records): 0% Common, 67% Frequent, 33% Rare.

**Dispersion** (3 records): 67% variable, 33% clumped.

**Flowering** (3 records with: Jan 0, Feb 1, Mar 2, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 0, Dec 0): Buds and Flowering from Mar; Nothing from Feb. Peak levels unreliable. Historically recorded as flowering from the dry season.



**Growth** (3 records with: Jan 0, Feb 1, Mar 2, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 0, Dec 0): Much from Feb to Mar; Rare and None not recorded. Peak levels unreliable at 100% in Feb to Mar.



**Seedlings** (1 record): All without any seedlings present.

**Fire Survival** (3 records): 67% resprouted from underground boles,

33% escaped fires in fire-safe areas.  
**Age to first flowering:** No data.

**Height** (3 records): 33% 0.2-1 m tall, 33% 1-2 m tall, 33% 2-5 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (3 records): 100% inland - further than 2 km from coast.

**Altitude** (3 records): 1000 - 1460 m; 1000<sub>lq</sub> - 1020<sub>med</sub> - 1020<sub>uq</sub>m.

**Landform** (3 records): 100% deep soil.

**Slope** (3 records): 100% gentle incline.

**Aspect** (3 records): 67% North, 17% South, 17% West.

**Soil Type** (3 records): 67% sandy, 33% loamy.

**Soil Colour** (3 records): 67% brown, 33% grey.

**Geology** (1 records): 100% granite.

**Vegetation** (3 records): 100% woodland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence data inadequate.

**Nature Reserves** (3 records): 33% in nature reserves.

**Habitat destruction** (3 records):

100% extensive natural habitat.

**Alien Invasive Species** (3 records): 100% none.

**Alien Density** (3 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (2 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

None found.

**Confusing Species:** None noted.

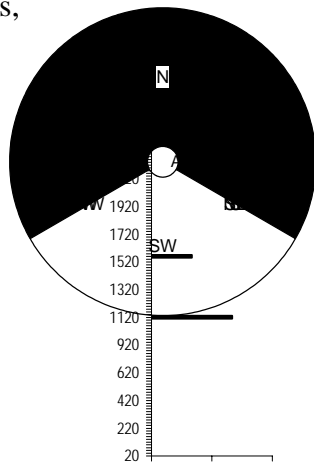
**Variation and Taxonomy:** This is the resprouting form with red flowers.

**Distribution:** Add.

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## *Protea asymmetrica* Beard 1963 Inyanga Sugarbush

**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

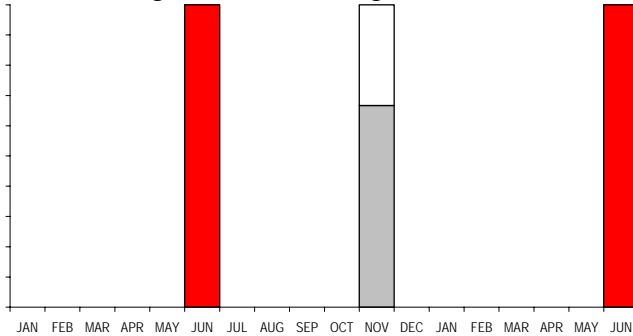
**Altitude** (7 records): 1800 - 2540 m; 2200<sub>lq</sub> - 2260<sub>med</sub> - 2280<sub>uq</sub>m.

### 7 Records

**Population** (7 records): 43% Common, 43% Frequent, 14% Rare.

**Dispersion** (6 records): 50% variable, 50% clumped.

**Flowering** (7 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 1, Jul 0, Aug 0, Sep 0, Oct 0, Nov 6, Dec 0): Flowering from Jun; Fruit from Nov; Nothing from Nov. Peak levels unreliable. Historically recorded as flowering from Jun to Aug.

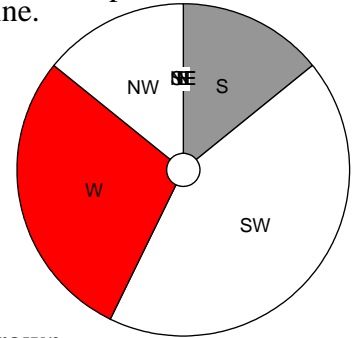


**Landform** (7 records): 71% deep soil, 14% rocky outcrops, 14% shallow soil.

**Slope** (7 records): 71% steep incline, 14% cliff, 14% gentle incline.

**Aspect** (7 records):

64% West,  
29% South,  
7% North.



**Soil Type** (7 records):

71% loamy,  
14% clayey,  
14% rocky.

**Soil Colour** (7 records):

43% brown,  
43% grey, 14% red.

**Geology** (3 records): 67% granite, 33% basalt.

**Vegetation** (7 records): 71% shrubland, 14% grassland, 14% wooded grassland.

### Conservation Status and Threat:

**Red Data List Status:** Vulnerable D2(i,ji).

Occurrence: 58 km<sup>2</sup>; Occupancy: 16 km<sup>2</sup>.  
Fragmentation index: 28%.

**Nature Reserves** (7 records): 86% in nature reserves - well conserved.

**Habitat destruction** (7 records): 86% extensive natural habitat, 14% naturally linear habitats.

**Alien Invasive Species** (7 records): 43% *Pinus*, 43% none, 14% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (7 records): 43% alien-free, 57% sparse.

### Cultivation & Utilization:

**Picking** (6 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

### Atlasers Notes:

Once open there is nothing asymmetric about it only while the buds open does the n side start first. Interesting that it was showing new growth while flowering (PVR96061702);

In two big clumps with some scattered plants in between (PVR96061702);

**Confusing Species:** None noted.

**Variation and Taxonomy:** None recorded.

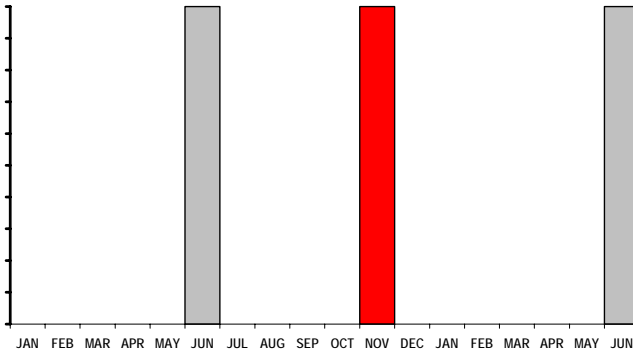
**Distribution:** Add.

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**Growth** (7 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 1, Jul 0, Aug 0, Sep 0, Oct 0, Nov 6, Dec 0): Much from Nov; Rare from Jun. Peak levels unreliable.



**Seedlings** (4 records): All without any seedlings present.

**Fire Survival** (2 records): 100% resprouted from underground boles.

**Age to first flowering:** A single record of flowering at 7 years.

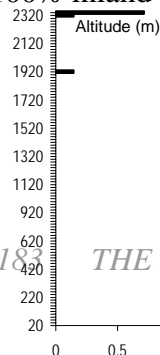
**Height** (7 records): 43% 0.2-1 m tall, 43% 1-2 m tall, 14% 2-5 m tall.

**Pollinators:** No data.

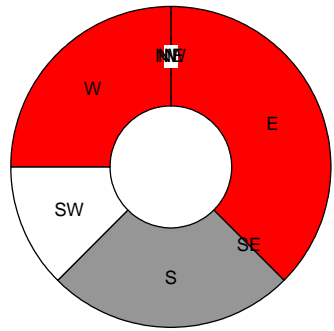
**Detailed Pollinators:** No additional data.

### Habitat:

**Distance to Ocean** (7 records): 100% inland - further than 2 km from coast.



***Protea enervis* Wild 1956**  
**Chimanimani Sugarbush**



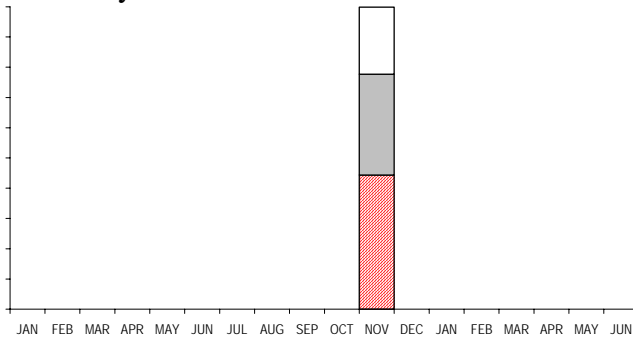
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**9 Records**

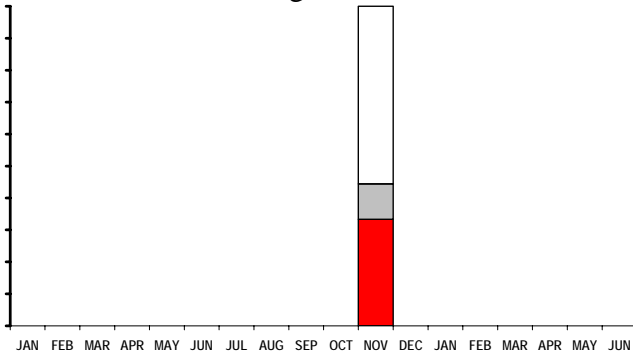
**Population** (9 records): 33% Common, 44% Frequent, 22% Rare.

**Dispersion** (7 records): 57% variable, 43% clumped.

**Flowering** (9 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 9, Dec 0): Buds, Fruit and Nothing from Nov. Peak levels meaningless. Historically recorded as flowering from Feb to May.



**Growth** (9 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 9, Dec 0): Much and None from Nov. Peak levels meaningless.



**Seedlings** (5 records): All without any seedlings present.

**Fire Survival** (8 records): 100% resprouted from underground boles.

**Age to first flowering:** First flowers not recorded.

**Height** (9 records): 78% 0-0.2 m tall, 22% 0.2-1 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (9 records): 100% inland - further than 2 km from coast.

**Altitude** (9 records): 1340 - 1720 m; 1400 *lq* - 1600 *med* - 1600 *uq*m.

**Landform** (9 records): 67% deep soil, 22% shallow soil, 11% rocky outcrops.

**Slope** (9 records): 67% gentle incline, 33% platform.

**Aspect** (8 records): 38% East, 31% South, 31% West.

**Soil Type** (9 records): 56% sandy, 44% loamy.

**Soil Colour** (9 records): 56% grey, 11% black, 11% brown, 11% white, 11% red.

**Geology** (8 records): 50% sandstone, 50% shale.

**Vegetation** (9 records): 78% grassland, 11% wooded grassland, 11% woodland.

**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened D2(ii).  
**Occurrence** (Fynbos): 37 km<sup>2</sup>; **Occupancy:** 3 km<sup>2</sup>. **Fragmentation index:** 8%.

**Nature Reserves** (9 records): 78% in nature reserves - well conserved.

**Habitat destruction** (9 records): 78% extensive natural habitat, 22% naturally fragmented habitats.

**Alien Invasive Species** (9 records): 100% none.

**Alien Density** (9 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (9 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

None found.

**Confusing Species:** None noted.

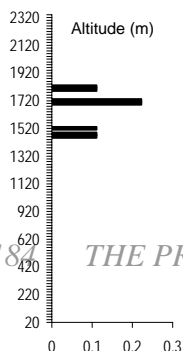
**Variation and Taxonomy:** None noted.

**Distribution:** Add.

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*Protea petiolaris* var. *elegans* Chisumpa & Brummitt 1987  
Sickle-leaf Sugarbush

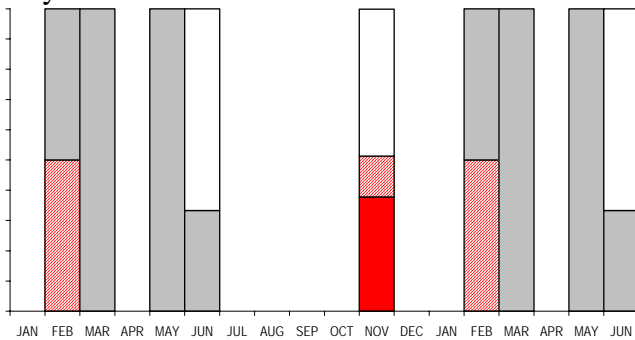
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**46 Records**

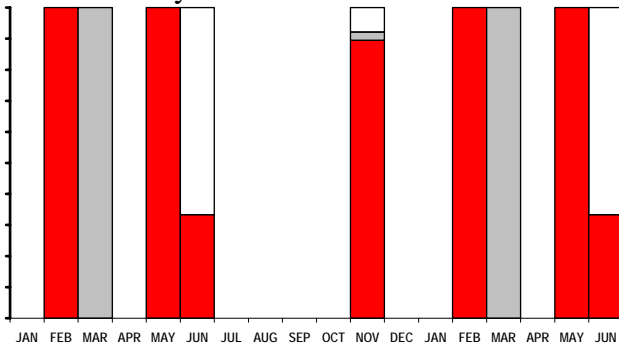
**Population** (46 records): 4% Common, 65% Frequent, 30% Rare.

**Dispersion** (35 records): 77% variable, 23% clumped.

**Flowering** (45 records with: Jan 0, Feb 2, Mar 1, Apr 0, May 2, Jun 3, Jul 0, Aug 0, Sep 0, Oct 0, Nov 37, Dec 0): Buds from Feb; Flowering from Nov; Peak Flowering and Over not recorded; Fruit from Feb to Jun; Nothing from Jun to Nov. Peak levels unreliable at 51% in Nov. Historically recorded as flowering from throughout the year.



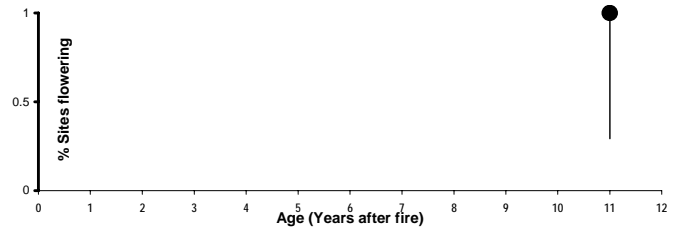
**Growth** (46 records with: Jan 0, Feb 2, Mar 1, Apr 0, May 2, Jun 3, Jul 0, Aug 0, Sep 0, Oct 0, Nov 38, Dec 0): Much from Nov to Feb and May to Jun; Rare from Mar; None from Jun. Peak levels unreliable at 100% from Feb to May.



**Seedlings** (10 records): Absent in 40%: fewer seedlings than prefire adults in 3 cases. Seedlings found in Feb and May (2).

**Fire Survival** (14 records): 86% resprouted from aerial trunks, 14% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 11 years no data from younger veld.



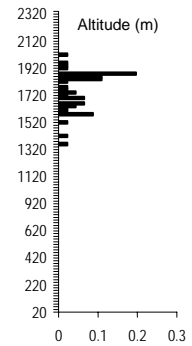
**Height** (46 records): 15% 1-2 m tall, 78% 2-5 m tall, 7% taller than 5 m.

**Pollinators** (2 records): 50% flies, 50% beetles.  
**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (46 records): 100% inland - further than 2 km from coast.

**Altitude** (46 records): 1240 - 1920 m; 1540 *lq* - 1660 *med* - 1760 *uq*m.



**Landform** (46 records): 93% deep soil, 4% shallow soil, 2% rocky outcrops.

**Slope** (46 records): 52% steep incline, 46% gentle incline, 2% platform.

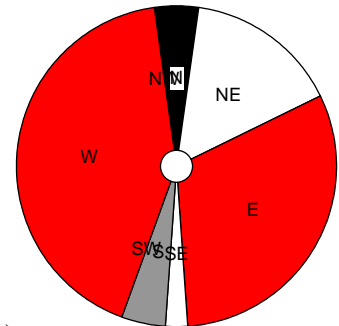
**Aspect** (45 records): 46% East, 42% West, 7% South, 6% North.

**Soil Type** (46 records): 83% loamy, 7% sandy, 7% clayey, 4% gravelly.

**Soil Colour** (45 records): 82% brown, 7% grey, 7% red, 4% orange.

**Geology** (43 records): 65% shale, 28% granite, 7% sandstone.

**Vegetation** (46 records): 67% woodland, 20% shrubland, 11% wooded grassland, 2% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern. Occurrence data inadequate.

**Nature Reserves** (46 records): 24% in nature reserves.

**Habitat destruction** (46 records): 57% extensive natural habitat, 35% road verges, 4% islands, 2% naturally linear habitats, 2% naturally fragmented habitats.

**Alien Invasive Species** (44 records): 50% none, 48% *Pinus*, 2% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (44 records): 50% alien-free, 9% sparse, 39% abundant, 2% dense.

**Cultivation & Utilization:**

**Picking** (13 records): 100% no sign of picking.  
**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

None found.

**Confusing Species:** None noted.

**Variation and Taxonomy:** None noted.

**Distribution:** Add.

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*Protea gaguedi* Gmel. 1791

**African Sugarbush**

*Grootsuikerbos*

**Other Common Names:** African White Sugarbush, Deciduous Sugarbush, Sugar Protea, White Sugarbush, *Afrikaansesuikerbos*, *Afrikaansewitsuikerbos*, *Witsuikerbos*, *chirapanzungu*, *isiqalaba (siNdebele)*, *isiQalaba (Zulu)*, *mubonda*, *Muririra (Rumanyo)*, *musitsuru*.

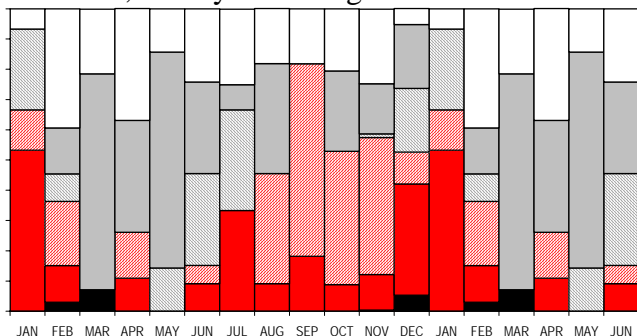
**Other Scientific Names:** *abyssinica* Willd 1798, *busseana* Engl 1892, *chrysolepis* Engl & Gilg 1903, *janssensii* De Wild 1914, *manikensis* De Wild 1914, *ramosa* Hauman 1948, *trigona* Phill 1910.

**516 Records**

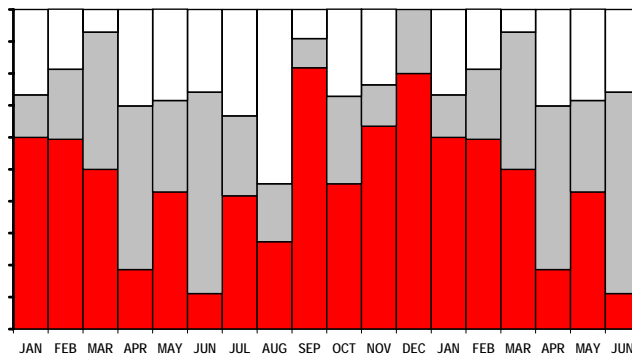
**Population** (513 records): 19% Common, 52% Frequent, 29% Rare.

**Dispersion** (431 records): 64% variable, 26% clumped, 8% widespread, 3% evenly distributed.

**Flowering** (482 records with: Jan 15, Feb 33, Mar 14, Apr 46, May 7, Jun 33, Jul 12, Aug 11, Sep 11, Oct 34, Nov 247, Dec 19): Buds from Feb and Aug to Nov; Flowering from Dec to Jan and Jul; Peak Flowering not significant; Over from Dec to Jan and Jun to Jul; Fruit from Mar to Jun, Aug, Oct and Dec; Nothing from Feb to Apr, Jun to Jul and Oct to Nov. Peak levels at 93% in Jan. Historically recorded as flowering variably depending on location, and in South Africa erratic, mainly from Aug to Feb.



**Growth** (474 records with: Jan 15, Feb 32, Mar 14, Apr 43, May 7, Jun 27, Jul 12, Aug 11, Sep 11, Oct 33, Nov 249, Dec 20): Much from Jul to Mar and May; Rare from Feb to Jul, Oct and Dec; None from Jan, Apr to Aug and Oct to Nov. Peak levels at 100% in Dec. Historically recorded as being deciduous by late Sep, with new growth in Oct to Nov.



**Seedlings** (140 records): Absent in 74%: fewer seedlings than prefire adults in 16 cases, and more in 2 cases. Seedlings found in Jan, Feb (2), Mar, Apr (8) and Jun (6).

**Fire Survival** (165 records): 58% resprouted from aerial trunks, 23% escaped fires in fire-safe areas, 19% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100% recorded at 7 years.



**Height** (502 records): 0.2% 0-0.2 m tall, 17% 0.2-1 m tall, 57% 1-2 m tall, 26% 2-5 m tall.

**Pollinators** (29 records): 48% bees or wasps, 41% beetles, 7% flies, 3% birds.

**Detailed Pollinators** (3 records): Honey Bee (2), Greater Double-collared Sunbird.

**Habitat:**

**Distance to Ocean** (513 records): 100% inland - further than 2 km from coast.

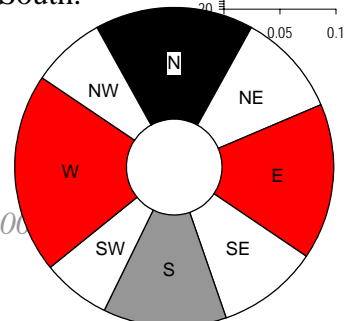
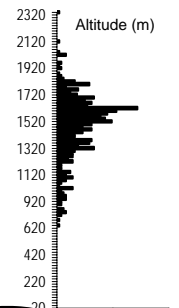
**Altitude** (513 records): 620 - 2500 m; 1240 *lq* - 1420 *med* - 1500 *uq*m.

**Landform** (509 records): 74% deep soil, 19% shallow soil, 3% rocky outcrops, 3% swamp.

**Slope** (509 records): 45% gentle incline, 28% steep incline, 21% platform, 4% hill top.

**Aspect** (435 records): 27% West, 26% East, 25% North, 21% South.

**Soil Type** (505 records): 56% loamy, 36% sandy, 3% clayey,



2% rocky, 2% gravelly, 0.4% peaty.  
**Soil Colour** (504 records): 49% brown,  
25% red, 17% grey, 5% orange, 3% yellow,  
1% black.

**Geology** (337 records): 63% granite,  
21% sandstone, 8% shale, 4% dolerite,  
3% conglomerate, 1% basalt.

**Vegetation** (504 records): 39% grassland,  
38% wooded grassland, 20% woodland,  
3% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern; Near  
Threatened D2(ii) in KwaZulu-Natal and  
Extinct in Namibia.

Occurrence: 790 792 km<sup>2</sup>; Occupancy: 971 km<sup>2</sup>.  
Fragmentation index: 0.001%.

**Nature Reserves** (513 records): 24% in nature  
reserves.

**Habitat destruction** (502 records):  
83% extensive natural habitat, 9% islands,  
3% road verges, 3% naturally linear habitats,  
1.0% naturally fragmented habitats.

**Alien Invasive Species** (484 records):  
65% none, 12% *Pinus*, 8% Fabaceae (chiefly  
alien *Acacia*), 8% other aliens,  
6% Myrtaceae.

**Alien Density** (483 records): 65% alien-free,  
28% sparse, 4% abundant, 4% dense.

**Cultivation & Utilization:**

**Picking** (244 records): 100% no sign of  
picking.

**Cultivation Status:** No noted cultivation.

**Atlasers Notes:**

Resprouting ex rootstock by straight  
unbranched stems (AJT98013102); Bole  
resprouting also occurring (MVP95021301);

Flowers unusually large (AGR99111129);

Plants exhibited characteristics of both  
species (*P. welwitschii*) (RHE99031310);

Flowers were aborted possibly too much rain?  
(LDMY0021302);

Scent sickly sweet (APE94021603);

There were many ants on the flowerheads  
(CSN92110801); Honey bees came mostly  
between 5-6pm: other times of day only a  
few were seen (IBG93011001);

Borers have layed eggs in base of last season's  
inflorescence (RHEY0092401);

A cup shaped birdnest of rootlets lined white  
woolly plant material was built around a  
dormant terminal bud at the base of 4 lateral  
branches; almost indistinguishable from the  
infructescences at first sight (IBG92102901);

Rosettes of stunted leaves resulting from arid  
conditions in growing season 1994-1995  
(IBG95040401);

This site shows how adaptable it can be - it likes  
vlei margins as well (IBG95040401);

**Confusing Species:** Easily confused with *P.*  
*welwitschii* (which is more hairy, retaining  
traces of these brown hairs on older leaves)  
and when not in flower (the flowers are  
much smaller and untidy) with *P. caffra*.

Records of identification queries = 41.

Records of corrected identification queries = 18.

**Variation and Taxonomy:** Not mentioned, in  
very marked contrast to *P. welwitschii*.

**Distribution:** From the Yemen to the Tugela.

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*Protea laetans* Davidson  
**Blyde Sugarbush**  
*Blydesuikerbos*

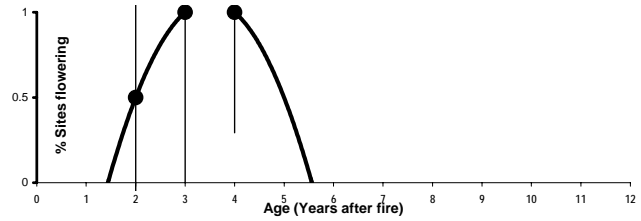
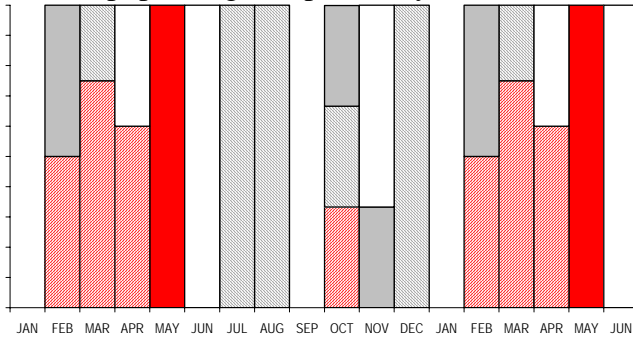
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**24 Records**

**Population** (24 records): 54% Common, 38% Frequent, 8% Rare.

**Dispersion** (23 records): 70% variable, 13% widespread, 13% clumped, 4% evenly distributed.

**Flowering** (24 records with: Jan 0, Feb 2, Mar 4, Apr 5, May 3, Jun 1, Jul 1, Aug 1, Sep 0, Oct 3, Nov 3, Dec 1): Buds from Feb to Apr and Oct; Flowering from May; Peak Flowering not recorded; Over from Mar and Jul to Oct and Dec; Fruit from Feb and Oct to Nov; Nothing from Apr, Jun and Nov. Peak levels unreliable at 100% in May. Historically recorded as flowering from Mar to Sep, peaking in Apr to May.



**Height** (24 records): 8% 1-2 m tall, 79% 2-5 m tall, 13% taller than 5 m.

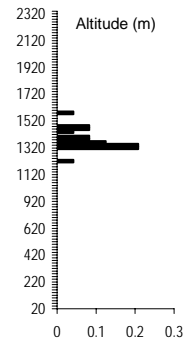
**Pollinators** (5 records): 40% beetles, 20% birds, 20% bees or wasps, 20% mites.

**Detailed Pollinators** (1 record): Honey Bee.

**Habitat:**

**Distance to Ocean** (24 records): 100% inland - further than 2 km from coast.

**Altitude** (24 records): 1100 - 1480 m; 1220 *lq* - 1240 *med* - 1240 *uq*m.

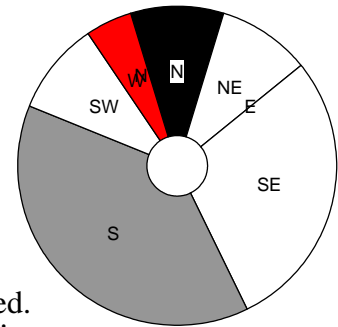


**Landform** (24 records): 71% deep soil, 25% shallow soil, 4% rocky outcrops.

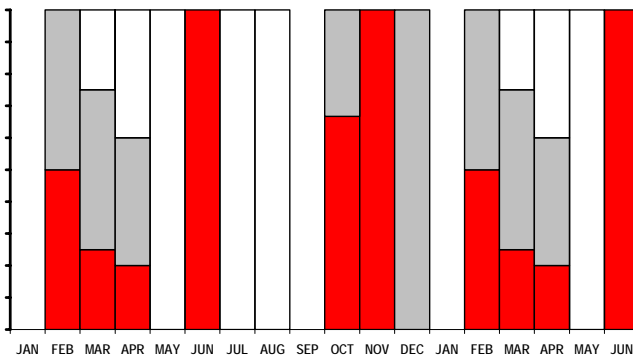
**Slope** (24 records): 63% gentle incline, 21% steep incline, 17% hill top.

**Aspect** (21 records): 60% South, 17% East, 14% North,

10% West.



**Growth** (23 records with: Jan 0, Feb 2, Mar 4, Apr 5, May 2, Jun 1, Jul 1, Aug 1, Sep 0, Oct 3, Nov 3, Dec 1): Much from Feb to Apr and Oct to Nov; Rare from Feb to Apr, Oct and Dec; None from Mar to Aug. Peak levels unreliable at 100% from Oct to Dec.



**Soil Type** (23 records): 52% sandy, 39% loamy, 9% clayey.

**Soil Colour** (23 records): 65% brown, 26% grey, 4% orange, 4% red.

**Geology** (9 records): 78% sandstone, 22% shale.

**Vegetation** (24 records): 83% wooded grassland, 13% woodland, 4% grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable

B1a(ii)b(iv)+2a(ii)b(iv). Occurrence: 101 km<sup>2</sup> with 94% conserved and 8% lost; Occupancy: 37 km<sup>2</sup> with 83% conserved and 12% lost. Fragmentation index: 37%.

**Nature Reserves** (24 records): 88% in nature reserves - well conserved.

**Habitat destruction** (24 records): 88% extensive natural habitat, 8% islands, 4% naturally linear habitats.

**Alien Invasive Species** (20 records): 95% none, 5% *Pinus*.

**Alien Density** (20 records): 95% alien-free, 5% sparse.

**Seedlings** (8 records): Absent in 75%: fewer seedlings than prefire adults in 1 case. Seedlings found in Jun.

**Fire Survival** (9 records): 78% resprouted from aerial trunks, 11% escaped fires in fire-safe areas, 11% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 2 years, and 100% recorded at 3 years. No data from veld older than 4 years.

**Cultivation & Utilization:****Picking** (14 records): 100% no sign of picking.**Cultivation Status:** No noted cultivation.**Atlassers Notes:**

Set To Flower Early Winter (APE94021606);

Sawed Off And Used For Firewood!

(AGR99110213);

**Confusing Species:** None noted.**Variation and Taxonomy:** Note noted.**Distribution:** Add.

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*Protea welwitschii* Engl. 1892  
**Dwarf Savanna Sugarbush**  
*Troshofiesuikerbos*

**Other Common Names:** Cluster-head Sugarbush, Honey-scented Sugarbush, Russet Sugarbush, White Sugarbush, *Witsuikerbos*, *Kersfeessuikerbos*, *Kleinsuikerbos*, *Suikerbos*, *Vaalsuikerbos*, *Welwitschsesuikerbos*, *isiQalaba* (Zulu).

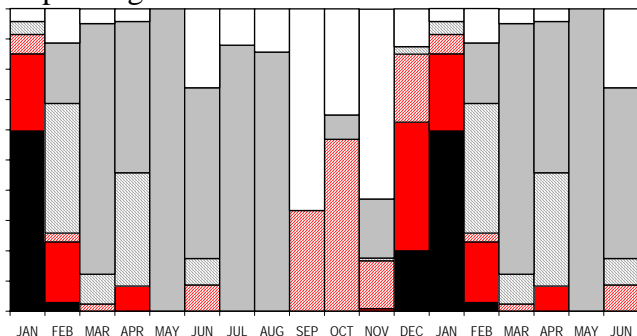
**Other Scientific Names:** *congensis* Engl 1892, *eickii* Engl 1892, *ferruginea* Engl 1892, *goetzeana* Eng 1892, *hirta* Klotzsch 1845, *kirkii* Wright 1909, *leucoblepharis* Bak 1910, *meliodora* Engl & Gilg 1903, *myrsinifolia* Engl & Gilg 1903, *obtusifolia* De Willd 1921, *swynnertonii* Moore 1911, *uhehensis* Engl 1892.

**560 Records**

**Population** (552 records): 28% Common, 59% Frequent, 13% Rare.

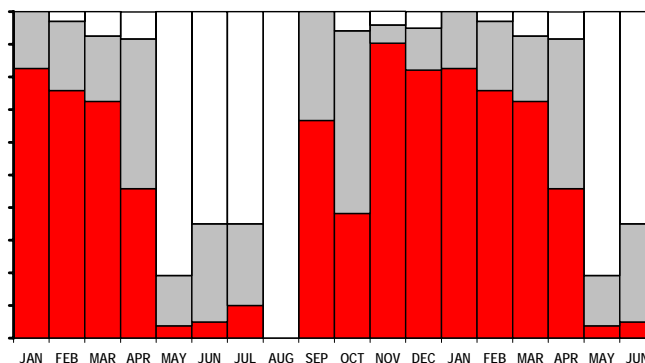
**Dispersion** (516 records): 54% variable, 37% clumped, 7% widespread, 2% evenly distributed.

**Flowering** (523 records with: Jan 47, Feb 35, Mar 41, Apr 24, May 26, Jun 23, Jul 25, Aug 7, Sep 3, Oct 37, Nov 215, Dec 40): Buds from Sep to Oct and Dec; Flowering from Dec to Feb; Peak Flowering from Dec to Jan; Over from Feb and Apr; Fruit from Feb to Aug and Nov; Nothing from Jun and Sep to Nov. Peak levels at 96% in Jan. Historically recorded as flowering from Feb to May in the tropics, and in South Africa, Dec to Apr peaking in Jan to Feb.



**Growth** (504 records with: Jan 46, Feb 33, Mar 40, Apr 24, May 26, Jun 20, Jul 20, Aug 3, Sep 3, Oct 34, Nov 216, Dec 39): Much from Sep to Apr; Rare from Feb to Apr, Jun to Jul and Sep to Oct; None from May to Aug. Peak levels at 100% in Sep and Jan.

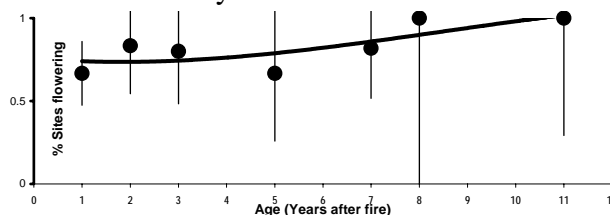
Historically recorded as growing from Sep to Nov, with growth ceasing completely during flowering in New Germany, KwaZulu-Natal.



**Seedlings** (115 records): Absent in 84%: fewer seedlings than prefire adults in 7 cases, and more in 2 cases. Seedlings found in Jan, Feb, Mar, Apr (2), Oct and Dec (3).

**Fire Survival** (158 records): 61% resprouted from underground boles, 33% resprouted from aerial trunks, 6% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100% recorded at 8 years.



**Height** (549 records): 54% 0.2-1 m tall, 34% 1-2 m tall, 11% 2-5 m tall.

**Pollinators** (31 records): 74% beetles, 10% bees or wasps, 6% flies, 6% none observed, 3% birds.

**Detailed Pollinators** (7 records): Monkey Beetle (2), Honey Bee (2), White-spotted Fruit Chafer, Green Beetle, Amethyst Fruit Chafer.

**Habitat:**

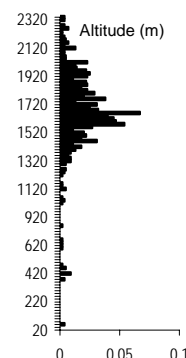
**Distance to Ocean** (552 records): 100% inland - further than 2 km from coast.

**Altitude** (552 records): 40 - 2380 m; 1440 *lq* - 1560 *med* - 1660 *uq*m.

**Landform** (552 records): 70% deep soil, 24% shallow soil, 5% rocky outcrops, 0.7% riverine, 0.7% swamp.

**Slope** (552 records): 67% gentle incline, 18% steep incline, 9% platform, 5% hill top.

**Aspect** (479 records): 27% West, 25% South, 25% East, 23% North.



**Soil Type** (527

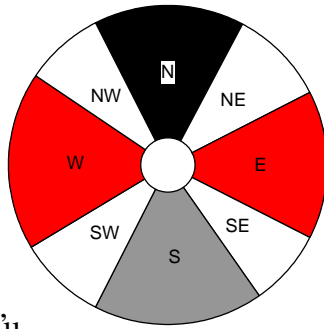
records):  
56% loamy,  
30% sandy,  
9% clayey,  
3% gravelly,  
2% rocky.

**Soil Colour** (524

records):  
62% brown,  
15% red, 9% grey,  
8% orange, 5% yellow,  
1% black.

**Geology** (411 records): 42% sandstone,  
25% granite, 21% shale, 6% conglomerate,  
4% dolerite, 1% basalt.

**Vegetation** (547 records): 40% grassland,  
35% wooded grassland, 19% woodland,  
5% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence: 1 391 500 km<sup>2</sup>; Occupancy:  
954 km<sup>2</sup>. Fragmentation index: 0.001%.

**Nature Reserves** (552 records): 40% in nature  
reserves.

**Habitat destruction** (527 records):

81% extensive natural habitat, 12% islands,  
4% road verges, 2% naturally fragmented  
habitats.

**Alien Invasive Species** (511 records):

60% none, 23% Fabaceae (chiefly alien  
*Acacia*), 9% *Pinus*, 5% Myrtaceae, 3% other  
aliens.

**Alien Density** (508 records): 60% alien-free,  
23% sparse, 10% abundant, 6% dense.

**Cultivation & Utilization:**

**Picking** (342 records): 100% no sign of  
picking.

**Cultivation Status:** Plantings - 2 records  
(0.4%).

**Atlasers Notes:**

Some with thick stems (50mm diam) & up to  
2.5m height (RHEY0102118);

Up to 6 flower heads on tip of one stem  
(APB93031701);

The honey scent together with its clustered  
flowers makes it very appealing. its scent  
does not go stale but lingers in the dried  
blossom (IBG95040701);

Second flowering (?) (JOOY0040906);

In firebreak - burned every year therefore does  
not get chance to flower (RHEY1031807);

It is nurtured by the staff at the reserve and the  
grass cut short around it (BRB97060201);  
Possibly a planted population that has been  
neglected and has spread disturbed due to  
cattle grazing (GHA92062301);

Population several thousand large  
(RHEY0012311);

Many ants and a few beetles on flowerheads  
(BRB97120601); Pollinators: ants  
(RHE99011706);

Picked a cluster of flowers complete with 2  
beetles *Lagria villosa* which did not move  
for more than a day - they had dug into the  
flowers (IBG95040701);

Pollinators: *Mauseolopsis sp.*, *Leucocelis  
testaceoguttata* & *Rutelinae sp.*  
(RHEY0012204);

Found on the watercourses in gulleys in  
mountain acacia woodland (AGR99110805);  
Mainly in seeps and water courses  
(AGR99111125); Growing in seepage zone  
(RHEY0110403);

On SW slope only (AKS95070604); Common  
on remnant undisturbed rocky ridges  
(JEB95102401);

**Confusing Species:** Regularly confused with  
*P. gagedi*, which tends to have solitary  
flowerheads and leaves with white hairs  
which rapidly fall off completely. A single  
instance of confusion with *P. simplex*.

Records of identification queries = 26.

Records of corrected identification queries = 15.

**Variation and Taxonomy:** Highly  
polymorphic with innumerable local races.  
Flowerheads are usually white or creamy-  
green with rusty brown hairs, but pink  
individuals occur sporadically. Two  
subspecies occur in southern Africa:

- On the lowveld of KwaZulu-Natal: subsp.  
*hirta*: a resprouter from an underground  
rootstock to 1m tall.
- On the highveld and highlands of Zimbabwe:  
an upright tree to 4m tall with a single trunk.  
This is a highly variable form, previously  
regarded by Beard as six subspecies, but all  
sunk by Rourke and Chisumpa and  
Brummitt.

**Distribution:** Add.

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***Protea wentzeliana* Engl. 1901 Chimanimani form  
Wentzel's Sugarbush**

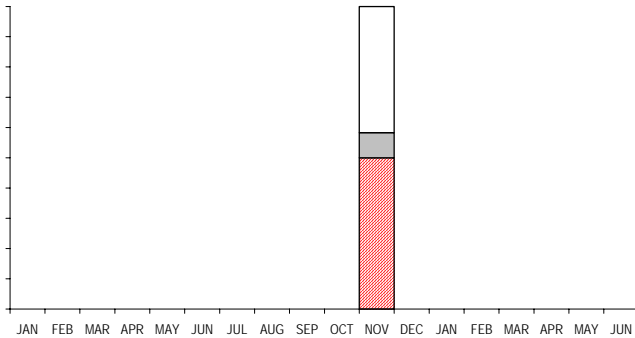
**Other Common Names:** None known.  
**Other Scientific Names:** *crinita* Beard 1963,  
*neocrinita* Beard 1973.

**12 Records**

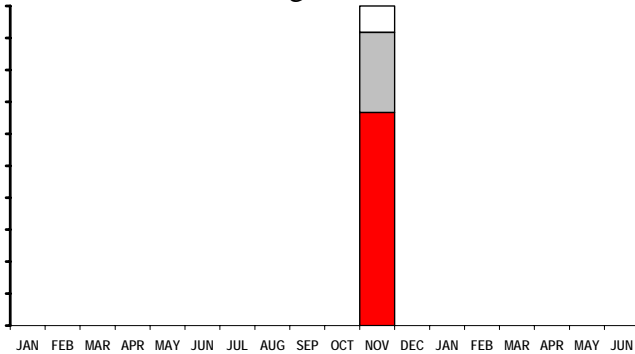
**Population** (12 records): 33% Common,  
58% Frequent, 8% Rare.

**Dispersion** (12 records): 58% clumped,  
42% variable.

**Flowering** (12 records with: Jan 0, Feb 0, Mar  
0, Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0,  
Oct 0, Nov 12, Dec 0): Buds and Nothing  
from Nov. Peak levels meaningless.  
Historically recorded as flowering from May  
to Dec.



**Growth** (12 records with: Jan 0, Feb 0, Mar 0,  
Apr 0, May 0, Jun 0, Jul 0, Aug 0, Sep 0, Oct  
0, Nov 12, Dec 0): Much and Rare from.  
Peak levels meaningless.



**Seedlings** (10 records): All without any  
seedlings present.

**Fire Survival** (11 records): 100% resprouted  
from underground boles.

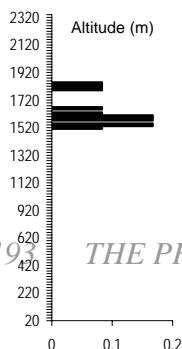
**Age to first flowering:** Data only for 7 year old  
veld with no flowering noted..

**Height** (12 records): 83% 0.2-1 m tall, 17% 1-2  
m tall.

**Pollinators** (1 record): 100% beetles.

**Detailed Pollinators** (2 records): Protea Rove  
Beetle, Great Protea Beetle.

**Habitat:**



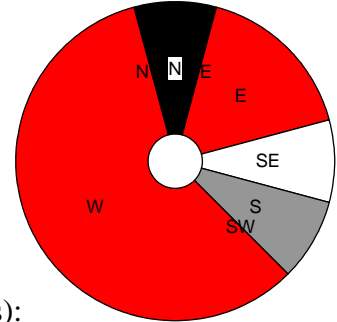
**Distance to Ocean** (12 records): 100% inland -  
further than 2 km from coast.

**Altitude** (12 records): 1400 - 1740 m; 1460<sub>lq</sub> -  
1480<sub>med</sub> - 1500<sub>uq</sub>m.

**Landform** (12 records): 92% deep soil,  
8% shallow soil.

**Slope** (12 records): 42% steep incline,  
42% gentle incline, 17% platform.

**Aspect** (12 records): 58% West, 21% East,  
13% South, 8% North.



**Soil Type** (12  
records):  
75% loamy,  
17% sandy,  
8% gravelly.

**Soil Colour** (12  
records):  
58% brown,  
33% grey,  
8% red.

**Geology** (11 records):  
64% sandstone, 36% shale.

**Vegetation** (12 records): 75% grassland,  
17% shrubland, 8% wooded grassland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.  
Occurrence: 21 km<sup>2</sup>; Occupancy: km<sup>2</sup>.

Fragmentation index: 9%.

**Nature Reserves** (12 records): 92% in nature  
reserves - well conserved.

**Habitat destruction** (12 records):  
100% extensive natural habitat.

**Alien Invasive Species** (12 records):  
100% none.

**Alien Density** (12 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (12 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

Plants looks bigger than in the higher altitude  
populations seen earlier (AGR99111015);

**Confusing Species:** None noted.

Records of identification queries = 1.

**Variation and Taxonomy:** Beard regards this  
as a separate species *P. neocrinita*, but  
Chisumpa and Brummitt regard it as a form  
of *P. wentzeliana*. Either way it high highly  
isolated and sufficiently different to deserve  
some taxonomic recognition.

**Distribution:** Add.

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*Protea caffra* subsp. *caffra* Meisn. 1856

**Common Sugarbush**

*Gewonesuikerbos*

**Other Common Names:** Common (Grassveld)

Sugarbush, Cup-and-saucer Sugarbush, Highveld Sugarbush, Mist-belt Sugarbush, Natal Sugarbush, Sickle-leaf Sugarbush, Transvaal Sugarbush, *Gemeiner Zuckerbusch*, *Ho%oveldsuikerbos*, *Natalsuikerbos*, *Newelstreeksuikerbos*, *Suikerbos*, *Waboom*, *inDlunge* (Xhosa), *isaDlunge* (Xhosa), *Isicalabane* (Swazi), *Isidlungu* (Swazi), *isiQalaba* (Xhosa, Zulu), *isiQalaba-sentaba* (Zulu), *isiQwane* (Xhosa), *Mogalagala* (N-Sotho), *Segwapi* (N-Sotho), *Sekila* (S-Sotho), *uHlinkihlane* (Zulu), *White Ruby*.

**Other Scientific Names:** Other Scientific

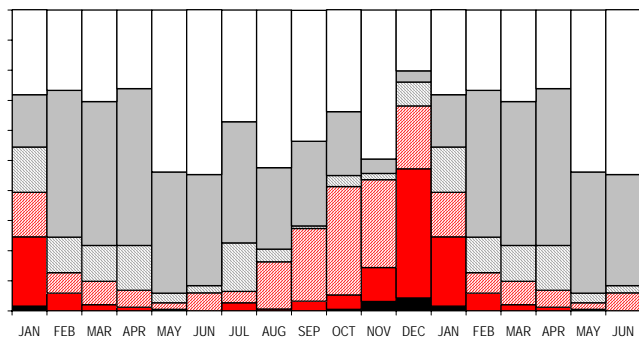
*Names: baurii* Phill 1910, *bolusii* Phill 1910, *multibracteata* Phill 1910, *natalensis* Phill 1910, *pegleriae* Phill 1910, *stipitata* Phill. 1934.

**2662 Records**

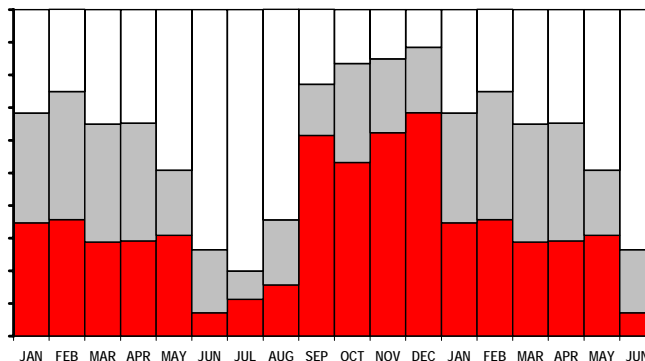
**Population** (2626 records): 1% Abundant, 40% Common, 44% Frequent, 15% Rare.

**Dispersion** (2480 records): 55% variable, 21% clumped, 18% widespread, 7% evenly distributed.

**Flowering** (2371 records with: Jan 305, Feb 322, Mar 194, Apr 161, May 186, Jun 84, Jul 186, Aug 166, Sep 124, Oct 189, Nov 291, Dec 163): Buds from Sep to Dec; Flowering from Dec to Jan; Peak Flowering and Over not significant; Fruit from Feb to Oct; Nothing from all year round. Peak levels at 76% in Dec. Historically recorded as flowering in a short, well-defined season of 6 weeks, from October at the coast, to December inland. <check>



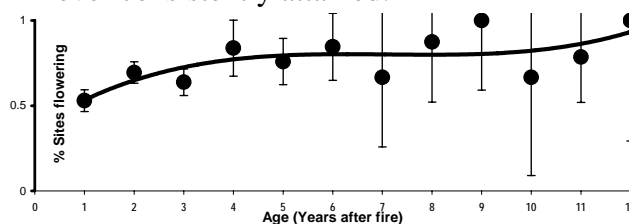
**Growth** (2310 records with: Jan 271, Feb 314, Mar 191, Apr 161, May 181, Jun 83, Jul 186, Aug 166, Sep 122, Oct 188, Nov 292, Dec 155): Much from Sep to May; Rare from Oct to May and Aug; None from Jan to Sep. Peak levels at 88% in Dec.



**Seedlings** (990 records): Absent in 64%: fewer seedlings than prefire adults in 122 cases, and more in 54 cases. Seedlings found in Jan (21), Feb (5), Mar (20), Apr (6), May (3), Jun (6), Jul (29), Aug (17), Sep (4), Oct (16), Nov (24) and Dec (25).

**Fire Survival** (1022 records): 37% resprouted from aerial trunks, 33% escaped fires in fire-safe areas, 26% resprouted from underground boles, 3% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100% never consistently attained.



**Height** (2586 records): 2% 0-0.2 m tall, 17% 0.2-1 m tall, 34% 1-2 m tall, 46% 2-5 m tall, 1% taller than 5 m.

**Pollinators** (195 records): 41% beetles, 30% birds, 14% bees or wasps, 8% flies, 4% none observed, 3% butterflies or moths, 0.5% mites.

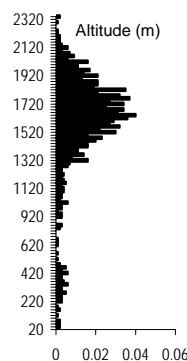
**Detailed Pollinators** (43 records): Malachite Sunbird (15), Transvaal Sugarbird (8), Scarab Beetle (5), Honey Bee (3), Greater Double-collared Sunbird (3), Moth (unspecified) (2), Amethyst Sunbird (2), Wasp (unspecified), Southern Double-collared Sunbird, Solitary Bee, Snout Weevil, Great Protea Beetle.

**Habitat:**

**Distance to Ocean** (2632 records): 99% inland - further than 2 km from coast.

**Altitude** (2632 records): 20 - 2380 m; 1340 *lq* - 1540 *med* - 1660 *uq*m.

**Landform** (2586 records): 50% deep soil, 37% shallow soil, 13% rocky outcrops.



**Slope** (2598 records): 50% steep incline, 41% gentle incline, 5% hill top, 2% platform, 2% cliff.

**Aspect** (2453 records): 39% South, 24% East, 20% West, 18% North.

**Soil Type** (2398

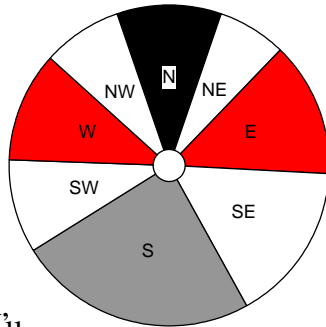
records):  
61% loamy,  
23% sandy,  
8% rocky,  
5% clayey,  
2% gravelly.

**Soil Colour** (2404

records):  
70% brown,  
11% grey, 9% red,  
4% orange, 3% yellow,  
3% black.

**Geology** (1733 records): 69% sandstone, 9% shale, 7% granite, 7% dolerite, 6% basalt, 2% conglomerate.

**Vegetation** (2588 records): 48% wooded grassland, 43% grassland, 5% shrubland, 3% woodland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence: 464 581 km<sup>2</sup> with 3% conserved and 17% lost; Occupancy: 3 975 km<sup>2</sup> with 29% conserved and 17% lost. Fragmentation index: 1%.

**Nature Reserves** (2632 records): 51% in nature reserves - well conserved.

**Habitat destruction** (2473 records): 83% extensive natural habitat, 10% islands, 4% naturally linear habitats, 1% naturally fragmented habitats.

**Alien Invasive Species** (2355 records): 67% none, 17% Fabaceae (chiefly alien *Acacia*), 8% *Pinus*, 4% Myrtaceae, 3% other aliens.

**Alien Density** (2345 records): 67% alien-free, 26% sparse, 4% abundant, 3% dense.

**Cultivation & Utilization:**

**Picking** (1713 records): 100% no sign of picking, 0.4% lightly picked, 0.1% severely picked.

**Cultivation Status:** Plantings - 1 record (0.04%).

**Witch's Broom Infestation:** 20 records (0.8%).

**Atlasers Notes:**

**Size**

Although most of them are small bushes a specimen had a trunk of 500mm thick and was over 5m high (BRB96112302); From less than 1m to 3m high (CVV95111401); Height: 0.2-1.5m (DDS93110703); 90% of proteas in plot are between 0.2-1m there are a few large scattered trees >5m (DDS93112301) Has all height classes 2; 3 and 4 (DOA93051504-5); Two height classes 5 & 4 (DOA97051808); Although average height is 4 many plants of about waist - high also present no seedlings seen though (ELO95020101);

Two plants seen were tree form - the rest were dwarfs (AGR99082401); Short stocky trees and are stunted compared to those in the Drakensberg (BRB96021101); Very stunted

(BRB99011701); Small much branched shrubs - not in bud or flower (JCM95102803); Plants are very dwarfed strongly resembling *P. simplex* but stems too thick and branched (LOTY1030701);

Some trees were > 5m high with large trunks 1 trunk circumference measured - 1.25m before first branching (NDKY1022414); Height ranges between coded 1 and 3 depending on the age of tree (seedlings from bole or adult) and also the extent of fire damage (PGD93102901 PGD93102901); One plant between 8 and 9m tall (RHEY0110514);

**Variation in colour**

Variation in perianth hair colour white to brown (APE94021601);

Flowerheads varying from white to red in colour, although usually only one colour on each tree. This population predominantly red flowered (KPB93011801);

Farm owner (Barry Wessels) says this specimen has pure white flowers (RHE99091204); White flowers (TDK99022002);

**Variation in leaf**

Plant with very narrow lanceolate leaves 12mm wide x 150mm long (RHEY2011301); Unusually thin leaves: 8 x 100mm on average (WEL95081501);

Of interest was the large leaflet size of the *P. caffra* (hinting at a possible connection with *P. comptonii*). Could not find a more typical parent plant - I returned during September 2000 only to microlite over the mountain looking for possible parents (LOTY0032301);

**Flowering**

Much variation in flowering some plants show 'nothing' (AJT97011204); Many plants show 'nothing' - have not flowered this season (AJT97012601); Many plants - about 40% - show no flowering this season (AJT97012604);

Only old plants flowering prolifically - low % cone - balance nothing (NSC95012415);

Some aborted buds (AWA95052401);

A small percentage of plants have cones (AWA96052213, AWA96052301);

This species is not serotinous - the cones are open and seed can be seen scattered around in the veld (PGD93102901);

How Tony can describe the stench of a *caffra* flowerhead as sweet sulphurous odour is a puzzlement because I have never smelt anything more revolting - *P. susannae* is a delightful perfume by comparison (VJK99070505);

**Fire survival**

Starting to resprout after fire of '90 (DDS93031701);

Occasional large mature plants - probably a very fierce fire about 20 yrs ago as reproters show 15-20 years growth: stunted (AKS95071002)

Saw totally burnt trees- however warden on duty explained the new method of "firing" to prevent further loss (ANM93082201); 80% of adult trees destroyed - some are partially burnt mainly on sides - no reprotouting present (DDS91122401); Only few trees (< than 6) not damaged by fire - crowns not burnt rest of clump 100% crown fire and are destroyed

by fire of August 1996 the fire was chased by the wind (DDS97012301);

Seedlings few to none - grass burnt annually (ATA92030401); Fire about 8 months ago but these plants have been dead a long time - a few seedlings (BRB95122804);

Grassfire fire did not harm mature trees (about 30 years old), fire about 1 month ago (AKS95070801); Lots of resprouting plants but mainly big trees (AWA95052401); Some bole and trunk survival from veld fires (BGE99013104); Proteas burnt at lower branches and leaves - some trees are dead but damage not significant (DDS93110603)

Light fire (grass mainly short) burnt only lower branches and leaves of proteas. Few dead trees - a few also burnt near canopy but not extensive (DDS93110604); Several seedlings present resprouting from previous fires - 1-2 yrs ago (DDS93110702-3); Fire damage only on isolated trees - large trees destroyed (n=6) fewer have topkill - fire old - 1 yr but probably only grass burns - trees very large and full flower (DDS94120701); Several trees burnt down and crowns (DDS96122101); Some damage to trees not severe (DDS96123002); Large trees apparently not affected by hot fire that went through last year October resprouting from trunks (ELO96111702);

Protected from fire during last 7 years - before that annual burning; still at resprouting stage (HVBY0012301, HVBY0022001);

Landowner Reported Last Fire 7 Years Ago. A Dense Population (NDKY1032701);

Judging from the trunks some trees seem very old (NDKY1022412);

Killed by fire (KPB93053004-6); Some killed some escaped (KPB93081401); Some burnt dead plants seen (NDKY0120701, NDKY1010701, NDKY1011301);

There seems to be several - at least two - age groups of plants: large old trees (>2m) resprout from trunk; many smaller plants (<50cm) are resprouting from the bole. All in all there are plants of many height (and age) classes (MHO92102701); Fire survival is either by seedling bole (individuals < 1m high) or trunk (> 1m) (PGD93102901);

Mostly arborescent (NSC95012603, NSC95012704+6); Plot of arborescent plants - some still multiple stem but with bark (NSC95012104); Bole growth observed (NDKY1022202); Low % reproters (NSC95012602); 25% reproters (NSC95012508); 50% resproters 50% arborescent (NSC95012703); Many resprouting (AWA95052404); Mostly woody resproters or arborescent (NSC95012416, NSC95012605);

Extensive fire damage to mature trees (TDK99013103-4);

This site burnt two months ago and all the plants will survive as usual as they are burnt yearly as a forest fire break. But if they do not get a respite of 4-5yrs they will become extinct as they reach the end of their life span (VJK99070501);

Numerous young plants in the grass cover under the adult plants (about 25years old) from 150-300m tall (VJK99070504);

I hope they don't burn every second year - then these plants are doomed the game need new grass but this policy does not allow the proteas to regenerate: some 4-6 yrs may be necessary or more !(VJK99071801);

Only in large rock blocks to afford fire protection - none in open grassland (AGRY3033002);

### **Regeneration**

Good recruitment (APE95020501); Lots of young (AWA96052301); A number of very young (AWA96060111); Several dead burnt plants and many young observed; (NDKY1011302); Hundreds of young (height 0.2-0.5m) plants observed (NDKY1030203); Some young plants seen (NDKY1020301); Hundreds of young (height 0.2-0.5m) plants observed (NDKY1030203-4+6); Frequent young plants observed: height 0.2-0.5m (NDKY1032704+6); Good recruitment - lots of young plants (NSC95021007); Many young plants (OUTY0101905); Lots Of Young Plants (WMP99081905);

Absence of young (AWA96052303);

Small population healthy but not increasing (PAN98022601); Stunted but surviving (PAN99020511);

Very small group growing taller now cattle have gone (PAN98022602);

Close to giving up the struggle: prolonged drought followed by excessive Feb-Mar 2000 rainfall not good news for proteas (PANY0041401);

This is a sheep and cattle farm and burn veld regularly. but if this site has a respite of 4-5 years the four plants could rehabilitate the area from their seeds - I mentioned it to the owner (VJK99070503);

### **Mortality**

A number appear to be dying (AWA96060303);

Old plants die - natural (ITA97050101);

Few dead trees are present at site but no recent fires during past 2 years (DDS93021801);

Condition look very good and healthy (ITA95032701, ITA96101801);

Very Miserable: Drought In 1999 then Excessive Rainfall First Quarter 2000 (PANY0041402);

Sickly with few old cones (PAN96041101);

Stunted stems from underground bole - small twigs at right angles to main stems - tightly closed cones - no empty receptacles seen (PAN98012201);

Veld overgrown - plants diseased and moribund fire needed to control aliens - as it is in forest reserve there is no chance of this (JCM93051401);

Some moribund and broken down (EGH92102101); Seeds released and lying on ground (LSB93042001);

### **Browsing**

Appear to have been grazed (AJT98061407);

Surviving plants severely overgrazed and broken by grazing animals (JCM93051404);

Heavily predated (MHO92110101); Cattle seen browsing leaves (RHEY1092405);

Beetles eating leaves in leaf buds (AGR98111110);

All leaves at tips of stems cropped back to 1/3 proper length by unknown agent (PANY1031001);

Baboon damage (LDM98110805); Lots of thin branches broken off - cause unknown possibly baboons? (RHE99013008);

#### **Predation and parasitism**

Insect lava (possibly Coleoptera) found destroying hearts of 2 buds (NDKY1020302); 2 spp ants and 1 Galediid Moth Encolpitis sp (NDKY1020701); Many leaves grossly enlarged distorted and pink (NDKY1011303); Growths on some leaves at extremities (PVR93112801); Parasitized by *Tapinanthus rubromarginatus* (Voelent, Mistletoe) (AGR98111314, NDKY1011303); Loranthaceae *Tapinanthus rubromarginatus* parasites on 1 plant (NDKY1011201); Some Mistletoe (PVR93112801);

#### **Harvesting**

Some stems taken for firewood (AGR99081916); Taken for firewood - bad - lots! (AGR99081917) Very heavy cutting (AGR99082009); These lonely trees are harvested (picked) for wood (DFJ99081909); Many picked for firewood (VCH99081902); Harvesting - probably for fuel (WMP99081905+06);

#### **Pollination**

Coleoptera in flowerheads - generally predominantly *Melyrid* spp (bright green iridescent), 6mm long (APE93020704); Black beetles 5-10mm big (CVV97122701); Small beetles (PANY1010301, PANY1010501);

Some flowerheads had ants in them. Malachite Sunbird also seen flying between bushes (ELO96111702); Many flowers having pollinators at about midday (HANY1011301);

Ants (HANY1011303, RHE99013003+6+8-10); Mainly Large Sugar Ants and 1 small Protea Beetle (JEB92010502);

Many (6 on one flowerhead) (flies? or ) small beetles (white spots on black back) pollinators noted. Unfortunately specimens (for identification) were lost in transport. Several bees also noted on flowers (JOO99121101);

Insects collected from a single bud inflorescence have been pinned for identification: 14 spp Of Coleoptera; 3 spp of Hymenoptera ;1 sp of Diptera - not included as pollinators as no florets were open (NDKY1010701);

#### **Witches Broom**

About 1 In 4 (AKS95070301); Common (AKS95070302, NDKY1020701); Abundant (JOOY0090302);

**Confusing Species:** Because, as currently conceived, this species is so variable, it is often confused for other species when atlassers move

between regions. It is also a difficult species to categorize due to its high variability. Although a tree that resprouts form epicormic buds, juveniles are bole resprouters and may be confused with *P. simplex* (which has very narrow stems) and *P. dracomontana* (which is robust and unbranched except in very old veld), but juveniles tend not to flower until they have attained tree form,

Records of identification queries = 63.

Records of corrected identification queries = 18.

**Variation and Taxonomy:** According to Rourke this is an exceptionally variable species consisting of a mosaic of local races each differing very slightly but merging imperceptibly with each other. Others disagree and the species has been split into several species the past. Variation in the leaves encompasses colour, texture, shape and size.

- Witwatersrand: hard, stiff thick-textured, grey-green leaves.
- Northern & Eastern Transvaal: flaccid, almost succulent, sickle-shaped leaves.
- Natal coast: thinner-textured, narrower and shorter leaves, lacking grey-green bloom.

Variation in inflorescences is also observed. Pink, carmine and creamy-green bracts occur. While many populations have hairless involucre bracts,

- Highveld populations have short-silvery pubescence on lower involucre bracts.

Historically the following species were recognized, but currently not even subspecies or varieties are formally recognized:

- *caffra*: Hard, stiff, thick, leaves; involucre bracts with short-silvery pubescence. Highveld and KwaZulu\_Natal escarpment.
- *multibracteata*: Narrow leaves; smaller and more numerous involucre bracts. A coastal species in KwaZulu-Natal.
- *rhodantha*: Broad, soft leaves often with a red stalk and vein; larger flowerheads and longer florets. On the eastern and northern Transvaal escarpment.
- *falcata*: Leaves like *rhodantha*, but sickle-shaped. Occurs on the Barberton and Swaziland escarpment.

It is somewhat suspicious that the forms *rhodantha* approximate the distribution of *P. rubropilosa* and *falcata* that of *P. curvata*.

**Distribution:** Add.

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*Protea caffra* subsp. *rhodantha* (Hook f.) 1893  
Mpumalanga Common Sugarbush

**Other Common Names:** Mist-belt Sugarbush, *Newelstreeksuikerbos*.

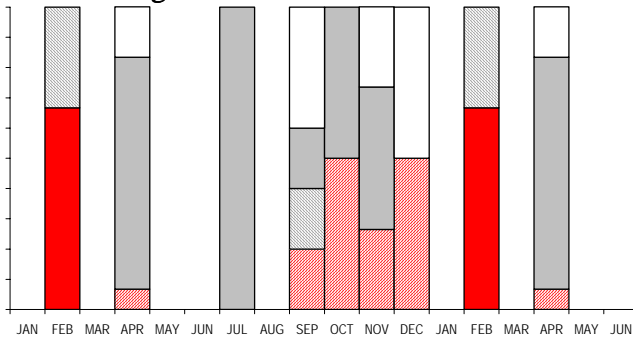
**Other Scientific Names:** *P. rhodantha* Hook f. 1893

**88 Records**

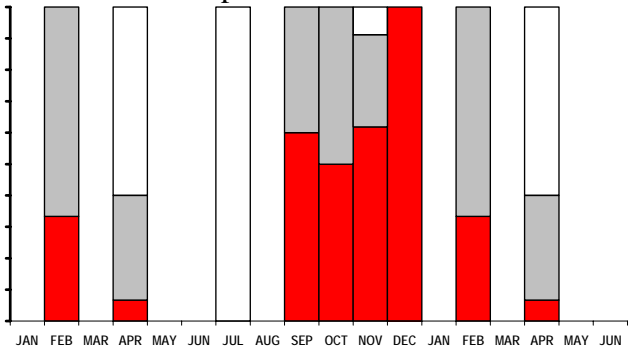
**Population** (88 records): 39% Common, 39% Frequent, 23% Rare.

**Dispersion** (75 records): 84% variable, 15% clumped, 1% evenly distributed.

**Flowering** (77 records with: Jan 0, Feb 3, Mar 0, Apr 30, May 0, Jun 0, Jul 1, Aug 0, Sep 5, Oct 2, Nov 34, Dec 2): Buds from Sep to Dec; Flowering from Feb; Peak Flowering not recorded; Over from Feb and Sep; Fruit from Apr to Jul and Sep to Nov; Nothing from Sep to Dec. Peak levels unreliable at 100% in Feb. Historically recorded as flowering from **XXX**.



**Growth** (76 records with: Jan 0, Feb 3, Mar 0, Apr 30, May 0, Jun 0, Jul 1, Aug 0, Sep 5, Oct 2, Nov 34, Dec 1): Much from Sep to Feb; Rare from Feb to Apr and Sep to Nov; None from Apr to Jul. Peak levels unreliable at 100% in Sep to Oct.



**Seedlings** (25 records): All without any seedlings present.

**Fire Survival** (7 records): 71% resprouted from underground boles, 14% escaped fires in fire-safe areas, 14% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year at 100%.



**Height** (86 records): 5% 0-0.2 m tall, 15% 0.2-1 m tall, 56% 1-2 m tall, 24% 2-5 m tall.

**Pollinators** (3 records): 67% beetles, 33% bees or wasps.

**Detailed Pollinators:** No additional data.

**Habitat:**

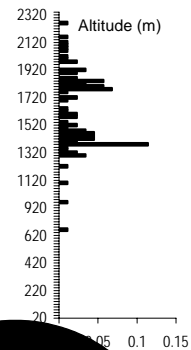
**Distance to Ocean** (88 records): 100% inland - further than 2 km from coast.

**Altitude** (88 records): 640 - 2160 m; 1280 *lq* - 1480 *med* - 1700 *uq*m.

**Landform** (88 records): 75% deep soil, 25% shallow soil.

**Slope** (87 records): 49% gentle incline, 30% steep incline, 20% hill top, 1% valley bottom.

**Aspect** (80 records): 33% North, 31% South, 24% East, 12% West.

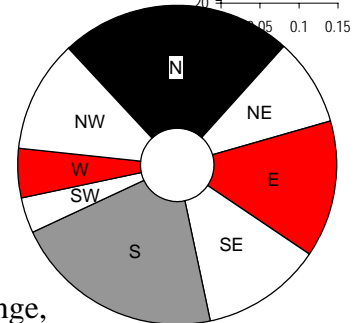


**Soil Type** (82 records): 84% loamy, 6% clayey, 5% sandy, 4% rocky, 1% gravelly.

**Soil Colour** (79 records): 56% brown, 37% red, 4% orange, 3% black, 1% grey.

**Geology** (23 records): 74% sandstone, 17% shale, 4% conglomerate, 4% dolerite.

**Vegetation** (88 records): 49% wooded grassland, 44% grassland, 5% woodland, 2% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence:** 39 826 km<sup>2</sup> with 9% conserved and 35% lost; **Occupancy:** 165 km<sup>2</sup> with 18% conserved and 24% lost. **Fragmentation index:** 0.004%.

**Nature Reserves** (88 records): 15% in nature reserves - inadequately conserved.

**Habitat destruction** (88 records): 78% extensive natural habitat, 10% islands, 7% road verges, 2% naturally linear habitats, 2% naturally fragmented habitats.

**Alien Invasive Species** (85 records): 76% none, 14% *Pinus*, 7% Fabaceae (chiefly alien *Acacia*), 1% Myrtaceae, 1% other aliens.

**Alien Density** (85 records): 76% alien-free, 13% sparse, 6% abundant, 5% dense.

**Cultivation & Utilization:**

**Picking** (37 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Witch's Broom Infestation:** 3 records (3%).

**Atlassers Notes:**

Very odd shiny dark green glabrous leaves with distinct red petiole (APE94021604); New stems red stems thick leaves quite clumped on stems (WMPY0100901);

Purity suspect - ants extremely active on flowers (APE94021605);

Parasitized by *Tapinanthus rubromarginatus* (AGR99110322-23);

Woolly aphids (LYMY0040505); An infestation of wooly Bug (NGFY0040503);

**Confusing Species:** None noted, but many atlassers did not attempt to distinguish between subtypes of *P. caffra*, and so these data are not a complete sample for this form. Records of identification queries = 8.

**Variation and Taxonomy:** None noted.

**Distribution:** Add.

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*Protea caffra* subsp. *falcata* (Beard) M.C. Lotter 1958, 2002  
Sickle-leaf Common Sugarbush

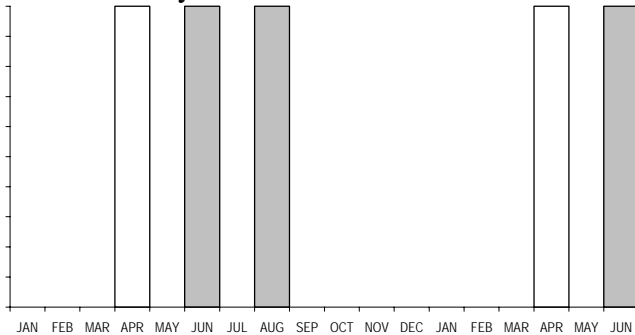
**Other Common Names:** None known.  
**Other Scientific Names:** *P. rhodantha* var. *falcata* (Beard) 1958.

**3 Records**

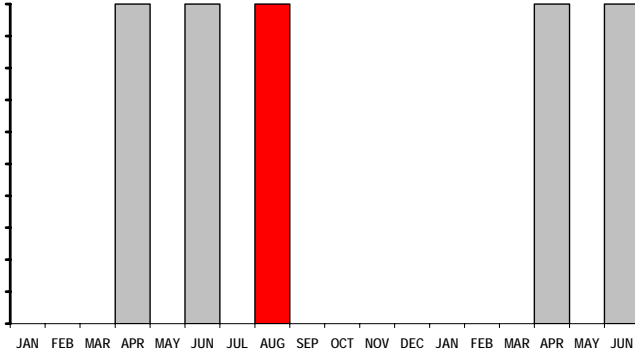
**Population** (3 records): 33% Common, 67% Frequent.

**Dispersion** (3 records): 100% clumped.

**Flowering** (3 records with: Jan 0, Feb 0, Mar 0, Apr 1, May 0, Jun 1, Jul 0, Aug 1, Sep 0, Oct 0, Nov 0, Dec 0): Buds from ; Flowering from ; Peak Flowering from ; Over from ; Fruit from Jun 100 - Aug 100 -; Nothing from Apr 100. Peak levels Unreliable. Historically no data



**Growth** (3 records with: Jan 0, Feb 0, Mar 0, Apr 1, May 0, Jun 1, Jul 0, Aug 1, Sep 0, Oct 0, Nov 0, Dec 0): Much from Aug 100 -; Rare from Apr 100 - Jun 100 -; None from .



**Seedlings** (2 records): Absent in 0%: more seedlings than prefire adults in 1 case. Seedlings found in Aug.

**Fire Survival** (2 records): 100% resprouted from aerial trunks.

**Age to first flowering:** Flowers recorded at 100% at 4 years.



**Height** (3 records): 67% 1-2 m tall, 33% 2-5 m tall.

**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

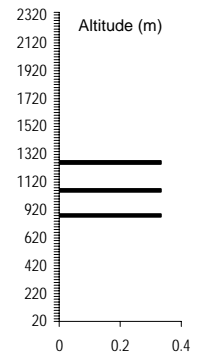
**Distance to Ocean** (3 records): 100% inland - further than 2 km from coast.

**Altitude** (3 records): 760 - 1160 m; 760<sub>lq</sub> - 780<sub>med</sub> - 780<sub>uq</sub> m.

**Landform** (3 records): 67% deep soil, 33% shallow soil.

**Slope** (3 records): 67% steep incline, 33% gentle incline.

**Aspect** (3 records): 67% South, 17% East, 17% West.

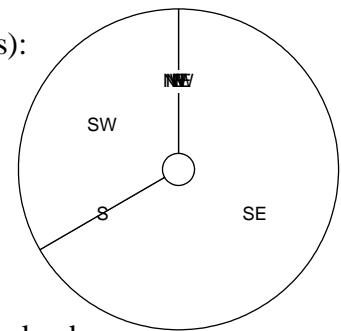


**Soil Type** (3 records): 100% loamy.

**Soil Colour** (3 records): 67% red, 33% brown.

**Geology** (1 records): 100% shale.

**Vegetation** (3 records): 67% wooded grassland, 33% grassland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence: 74 km<sup>2</sup> with 0% conserved and 11% lost; Occupancy: 9 km<sup>2</sup> with 0% conserved and 1% lost. Fragmentation index: 13%.

**Nature Reserves** (3 records): 33% in nature reserves.

**Habitat destruction** (3 records): 67% extensive natural habitat, 33% naturally linear habitats.

**Alien Invasive Species** (2 records): 100% none.

**Alien Density** (2 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (2 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

No Sign Of Any Fire Damage (JEB93080801); This Taxon Had Much More Glaucous Leaves That That Of The Plants Occurring To The North-east Of Barberton Everything Else (habit Leaf Shape And Length) Fits For The Pr Caff Falc (LOTY1041102); Narrow Strongly Curved Leaves (SHR99062601);

**Confusing Species:** Easily confused with *P. curvata*, especially when not in flower, but it has leaves more flaccid, light green (not bluish) in colour, plant not as unbranched-erect, and involucre bracts hairless (not velvety haired) and cream (not red) coloured.

Records of identification queries = 3.



Records of corrected identification queries = 2.

**Variation and Taxonomy:** None recorded.

**Distribution:** Confined to the hills around  
Barberton in South Africa and Swaziland.

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*Protea caffra* subsp. *gazensis* (Beard) Chisumpa & Brummitt 1959, 1987  
**Manica Sugarbush**

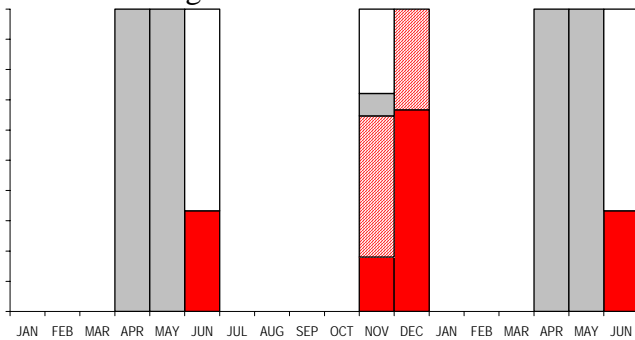
**Other Common Names:** Gazaland Sugarbush.  
**Other Scientific Names:** *gazensis* Beard 1959.

**141 Records**

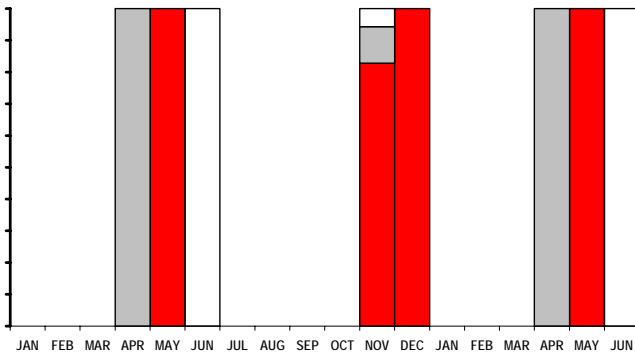
**Population** (140 records): 19% Common, 59% Frequent, 23% Rare.

**Dispersion** (122 records): 88% variable, 10% clumped, 2% widespread.

**Flowering** (130 records with: Jan 0, Feb 0, Mar 0, Apr 1, May 1, Jun 3, Jul 0, Aug 0, Sep 0, Oct 0, Nov 122, Dec 3): Buds from Nov to Dec; Flowering from Jun and Dec; Peak Flowering and Over not recorded Fruit from Apr to May; Nothing from Jun and Nov. Peak levels unreliable. Historically recorded as flowering from Dec to Mar.



**Growth** (130 records with: Jan 0, Feb 0, Mar 0, Apr 1, May 1, Jun 3, Jul 0, Aug 0, Sep 0, Oct 0, Nov 122, Dec 3): Much from May and Nov to Dec; Rare from Apr; None from Jun. Peak levels unreliable.



**Seedlings** (33 records): All without any seedlings present.

**Fire Survival** (42 records): 69% resprouted from aerial trunks, 21% resprouted from underground boles, 10% escaped fires in fire-safe areas.

**Age to first flowering:** First flowers recorded at 2 years, 50% estimated at 2 years, and 100% recorded at 2 years.



**Height** (135 records): 18% 0.2-1 m tall, 42% 1-2 m tall, 38% 2-5 m tall, 1% taller than 5 m.

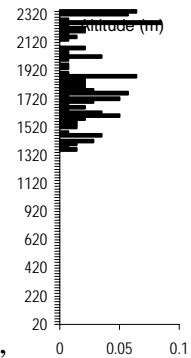
**Pollinators** (7 records): 57% birds, 29% bees or wasps, 14% flies.

**Detailed Pollinators** (2 records): Transvaal Sugarbird, Malachite Sunbird.

**Habitat:**

**Distance to Ocean** (141 records): 100% inland - further than 2 km from coast.

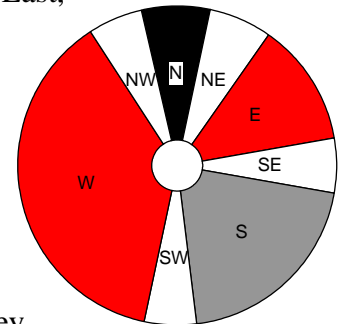
**Altitude** (141 records): 1240 - 2560 m; 1500<sub>lq</sub> - 1700<sub>med</sub> - 1980<sub>uq</sub>m.



**Landform** (141 records): 94% deep soil, 4% shallow soil, 1% rocky outcrops.

**Slope** (141 records): 48% steep incline, 38% gentle incline, 8% platform, 7% hill top.

**Aspect** (128 records): 44% West, 25% South, 19% East, 12% North.



**Soil Type** (141 records): 87% loamy, 5% gravelly, 4% sandy, 4% clayey.

**Soil Colour** (141 records): 56% brown, 27% red, 11% grey, 2% orange, 1% black, 1% yellow.

**Geology** (100 records): 50% shale, 35% granite, 13% sandstone, 1% basalt, 1% silcrete or ferricrete.

**Vegetation** (141 records): 45% grassland, 26% woodland, 14% wooded grassland, 14% shrubland.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 7 213 km<sup>2</sup>; Occupancy: 165 km<sup>2</sup>. Fragmentation index: 2%.

**Nature Reserves** (141 records): 52% in nature reserves - well conserved.

**Habitat destruction** (138 records): 85% extensive natural habitat, 10% road verges, 3% naturally fragmented habitats, 1% islands.

**Alien Invasive Species** (140 records): 54% none, 25% *Pinus*, 21% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (140 records): 54% alien-free,  
27% sparse, 13% abundant, 6% dense.

**Cultivation & Utilization:**

**Picking** (53 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

Was Resprouting From The Bole After A Very  
Recent Fire But May Still Resprout From  
Higher Up On The Trunk (EGH92102101);

**Confusing Species:** None noted.

**Variation and Taxonomy:** No variation noted.  
Whether this is regarded as a subspecies or  
species is not significant, so long as its  
distinctiveness is maintained.

**Distribution:** Add.

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***Protea caffra* subsp. *killimandscharica* (Engl.) Chisumpa & Brummitt 1892, 1987**  
**Kilimanjaro Sugarbush**

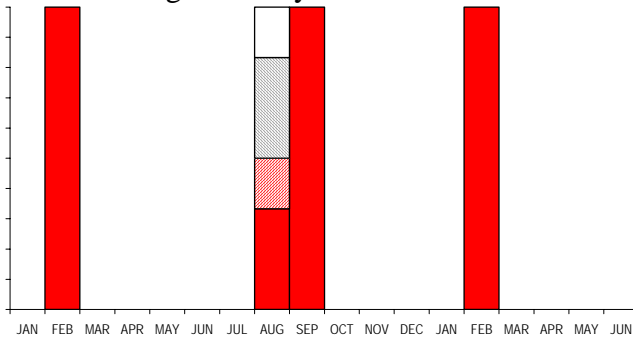
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**9 Records**

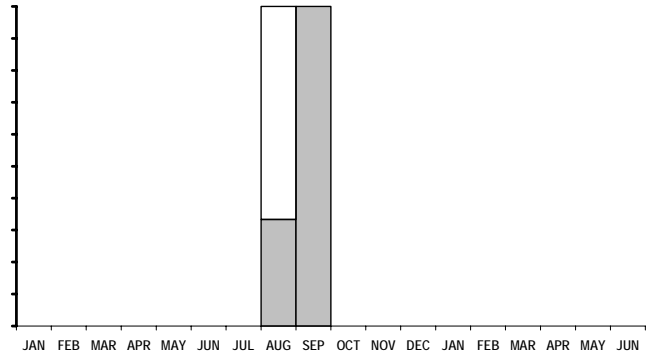
**Population** (9 records): 11% Common, 67% Frequent, 22% Rare.

**Dispersion** (8 records): 88% variable, 13% clumped.

**Flowering** (9 records with: Jan 0, Feb 2, Mar 0, Apr 0, May 0, Jun 0, Jul 0, Aug 6, Sep 1, Oct 0, Nov 0, Dec 0): Buds and Nothing not significant; Flowering from Feb and Aug to Sep; Peak Flowering and Fruit not recorded; Over from Aug;. Peak levels unreliable. Historically recorded as flowering more or less throughout the year.



**Growth** (7 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 0, Jul 0, Aug 6, Sep 1, Oct 0, Nov 0, Dec 0): Much not recorded; Rare from Aug to Sep; None from Aug. Peak levels unreliable.



**Seedlings:** No data.

**Fire Survival :** No data.

**Age to first flowering:** No data.

**Height** (9 records): 44% 0.2-1 m tall, 33% 1-2 m tall, 22% 2-5 m tall.

**Pollinators** (1 record): 100% birds.

**Detailed Pollinators** (2 records): Scarlet-chested Sunbird, Malachite Sunbird.

**Habitat:**

**Distance to Ocean** (9 records): 100% inland - further than 2 km from coast.

**Altitude** (9 records): 3040 - 3820 m; 3120<sub>lq</sub> - 3140<sub>med</sub> - 3140<sub>uq</sub>m.

**Landform** (9 records): 78% deep soil, 22% rocky outcrops.

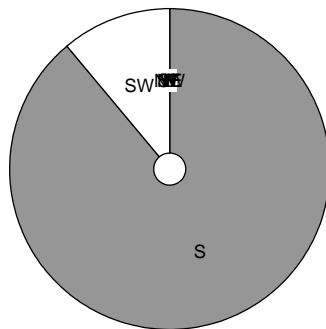
**Slope** (9 records): 67% steep incline, 33% gentle incline.

**Aspect** (9 records): 94% South, 6% West.

**Soil Type** (8 records): 75% loamy, 25% rocky.

**Soil Colour** (8 records): 75% black, 25% brown.

**Geology** (9 records): 89% basalt, 11% sandstone.



**Vegetation** (9 records): 67% thicket, 11% shrubland, 11% woodland, 11% desert.

**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

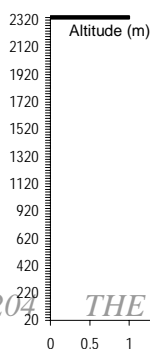
Occurrence data inadequate.

**Nature Reserves** (9 records): 89% in nature reserves - well conserved.

**Habitat destruction** (8 records): 88% extensive natural habitat, 13% islands.

**Alien Invasive Species** (8 records): 100% none.

**Alien Density** (8 records): 100% alien-free.



**Cultivation & Utilization:****Picking** (6 records): 100% no sign of picking.**Cultivation Status:** No noted cultivation.**Atlassers Notes:**

Flowering appears to be erratic thus flowering  
more or less throughout year!  
(DOA98081305);

**Confusing Species:** None noted.**Variation and Taxonomy:** No variation noted.  
Whether this is regarded as a subspecies or  
species is not significant, so long as its  
distinctiveness is maintained.**Distribution:** Add.

INCLUDEPICTURE

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*Protea dracomontana* Beard 1958  
**Drakensberg Sugarbush**  
*Drakensbergsuikerbos*

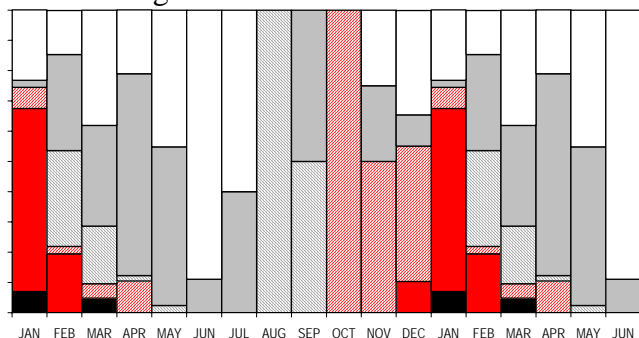
**Other Common Names:** Alpine Sugarbush, Drakensberg Dwarf Sugarbush.  
**Other Scientific Names:** *None*.

**285 Records**

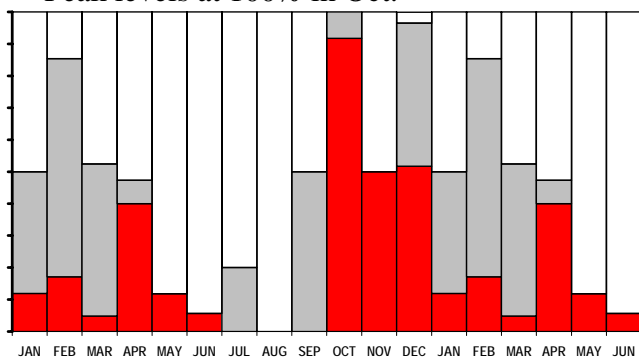
**Population** (284 records): 4% Abundant, 53% Common, 40% Frequent, 3% Rare.

**Dispersion** (279 records): 53% variable, 23% widespread, 15% clumped, 9% evenly distributed.

**Flowering** (275 records with: Jan 43, Feb 41, Mar 21, Apr 57, May 42, Jun 18, Jul 5, Aug 1, Sep 2, Oct 12, Nov 4, Dec 29): Buds from Oct to Dec; Flowering from Jan; Peak flowering not significant; Over from Feb; Fruit from Feb to May; Nothing from Jan, Mar to Jul and Nov to Dec. Peak levels at 75% in Jan. Historically recorded as flowering from Jan to Mar.



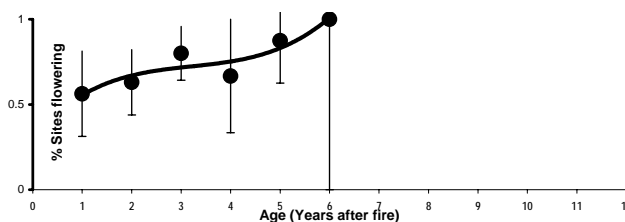
**Growth** (281 records with: Jan 42, Feb 41, Mar 21, Apr 55, May 51, Jun 18, Jul 5, Aug 1, Sep 2, Oct 12, Nov 4, Dec 29): Much from Apr and Oct to Dec; Rare from Dec to Mar; None from Jan and Mar to Sep and Nov. Peak levels at 100% in Oct.



**Seedlings** (130 records): Absent in 74%: fewer seedlings than prefire adults in 14 cases, and more in 3 cases. Seedlings found in Jan (6), Mar (5), May, Jul (2), Sep and Nov (2).

**Fire Survival** (89 records): 72% resprouted from underground boles, 17% escaped fires in fire-safe areas, 9% resprouted from aerial trunks, 2% survived by seedlings only.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100% recorded at 6 years.



**Height** (282 records): 16% 0-0.2 m tall, 83% 0.2-1 m tall, 1% 1-2 m tall.

**Pollinators** (37 records): 65% beetles, 22% bees or wasps, 8% flies, 3% birds, 3% none observed.

**Detailed Pollinators** (5 records): Protea Rove Beetle (3), Malachite Sunbird, Honey Bee.

**Habitat:**

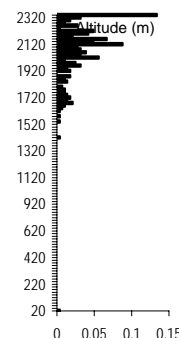
**Distance to Ocean** (284 records): 100% inland - further than 2 km from coast.

**Altitude** (284 records): 1300 - 2540 m; 1860 *lq* - 2020 *med* - 2060 *uq* m.

**Landform** (284 records): 65% deep soil, 29% shallow soil, 6% rocky outcrops, 1% riverine.

**Slope** (284 records): 57% steep incline, 27% gentle incline, 10% hill top, 3% cliff, 1% platform.

**Aspect** (256 records): 37% North, 35% East, 18% South, 10% West.



**Soil Type** (276 records):

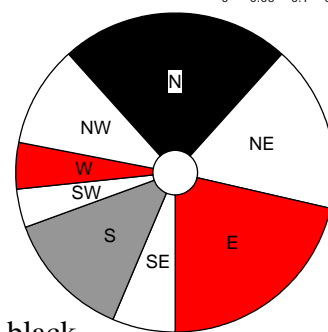
78% loamy, 8% gravelly, 5% sandy, 4% rocky, 3% peaty, 2% clayey.

**Soil Colour** (280 records):

83% brown, 13% black, 3% yellow, 2% grey.

**Geology** (270 records): 48% sandstone, 38% basalt, 11% dolerite, 3% shale.

**Vegetation** (284 records): 93% grassland, 4% wooded grassland, 2% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

**Occurrence** (Fynbos): 18 278 km<sup>2</sup> with 14% conserved and 23% lost; **Occupancy:** 373 km<sup>2</sup> with 84% conserved and 2% lost. **Fragmentation index:** 2%.

**Nature Reserves** (284 records): 88% in nature reserves - well conserved.

**Habitat destruction** (267 records): 90% extensive natural habitat, 5% naturally linear habitats, 3% naturally fragmented habitats, 2% islands.

**Alien Invasive Species** (209 records):  
90% none, 5% *Pinus*, 2% Fabaceae (chiefly alien *Acacia*), 2% other aliens.

**Alien Density** (208 records): 91% alien-free, 9% sparse.

**Cultivation & Utilization:**

**Picking** (207 records): 100% no sign of picking, 0.5% lightly picked.

**Cultivation Status:** No noted cultivation.

**Atlasers Notes:**

**Size**

Intermediate zone between *caffra* and *dracomontana*; (AGR99021506); Hybrids 0.8m and *P. dracomontana* 0.3 m tall (APE93020717); There are some suspicious looking *Dracos* especially one masquerading as *P. caffra* (AWA96060205); Some *Dracos* could be bastards - no *Caffras* in sight though (AWA96060206);

Not typical to the normal appearance they stand higher and many are branched this probably due to the fact that it is an isolated and small population (ODE95030401);

These are the tallest I have come across and the plants must be quite old. some of the plants are up to 1.5m high (ODE96032102);

**Flowering**

Looks as if it did not grow or flower much this year - no old heads but lots of aborted - very few cones with seeds (AGRY0040120); Odd cone seen but flowering apparently not very common over last year (AGRY0040121); No sign of flowers (BRB99011703); Many seed heads not matured (BRB99013004); One or two flowers in good shape the majority had buds which appeared dead (BRB99013007); Only about 6 out of population flowering (NSC95012611);

**Colour forms**

Many patches were mainly pinkish flowers other patches were white (BRB98012407); Buds pink (LKAY0040302); The flowers are pale yellow (ODE95030401);

Multiple heads in 4 plants (NSC95012008);

**Fire survival**

Escaped a number of fires due to their position in the valley floor (between stream and rocky bed) (ODE96032102);

Very moth eaten (BRB99013101);

**Browsing and diseases**

New stem next to thick one - much branched - lower branches eaten off at some stage (AWA95052602); Heavily predated - is also grazed by eland amongst other animals. (MHO92110101);

In a proportion of plants it appears the buds had never matured (possibly attacked by an insect?) (BRB98052302); Leaves with pink curled sections-disease? (LKAY0040402); Some of the plants have been infested by a kind of fungal disease which forms black spots all over the leaves - this was absent a year ago (ODE96032102);

Leaves turn 90 degrees at base so that neither leaf surface is orientated upwards or downwards (RHE99052203);

**Populations**

Only high up on this plot barely made 10 plants (AWA96060207);

This is the largest stand I have ever seen in the Drakensberg (ODE95070501);

**Pollinators**

Many pollinators including a shiny dark green beetle approx 6mm long and long thin black ones with pointed rear ends about 8mm long. An occasional Malachite Sunbird was seen (BRB96011304);

**Confusing Species:** *P. dracomontana* is very easily confused with *P. caffra* and hybrids occur where the two species meet.

Typically, *P. dracomontana* is an unbranched resprouter from an underground bole, but in old veld it may branch extensively: it never forms the typical tree-form of *P. caffra*.

Records of identification queries = 15.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** No variation is noted. *Protea inyanganiensis* is regarded as a separate entity, probably worthy of specific status.

**Distribution:** Add.

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*Protea inyanganiensis* Beard 1963  
Rhodes Sugarbush  
*Inyangani Sugarbush*

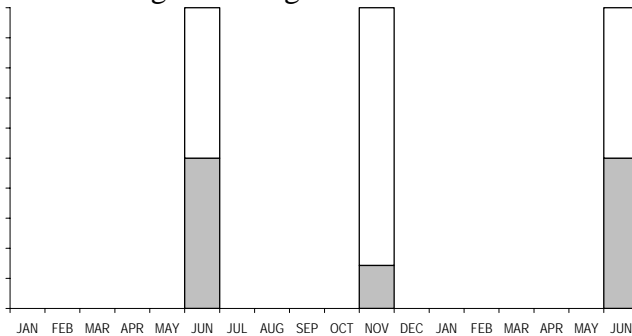
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**9 Records**

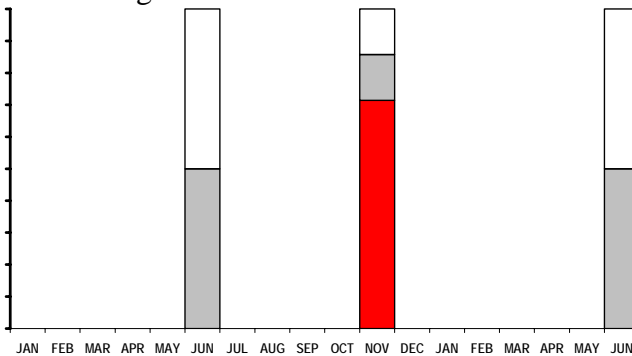
**Population** (9 records): 11% Common, 67% Frequent, 22% Rare.

**Dispersion** (9 records): 78% variable, 22% clumped.

**Flowering** (9 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 2, Jul 0, Aug 0, Sep 0, Oct 0, Nov 7, Dec 0): Fruit recorded in Jun and Nothing in Jun and Nov. Peak levels meaningless. Historically recorded as flowering from Aug to Oct.



**Growth** (9 records with: Jan 0, Feb 0, Mar 0, Apr 0, May 0, Jun 2, Jul 0, Aug 0, Sep 0, Oct 0, Nov 7, Dec 0): Much recorded in Nov; Rare and None in Jun. Peak levels meaningless.



**Seedlings** (5 records): All without any seedlings present.

**Fire Survival** (2 records): 100% resprouted from underground boles.

**Age to first flowering:** No data.

**Height** (9 records): 100% 0.2-1 m tall.

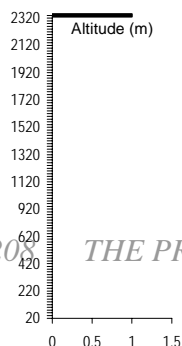
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (9 records): 100% inland - further than 2 km from coast.

**Altitude** (9 records): 2440 - 2600 m; 2500<sub>lq</sub> - 2520<sub>med</sub> - 2520<sub>uq</sub> m.



**Landform** (9 records): 44% deep soil, 33% rocky outcrops, 11% swamp, 11% shallow soil.

**Slope** (9 records): 44% hill top, 22% gentle incline, 22% platform, 11% steep incline.

**Aspect** (7 records): 43% North, 29% South, 14% East, 14% West.

**Soil Type** (9 records):

44% peaty, 33% loamy, 22% clayey.

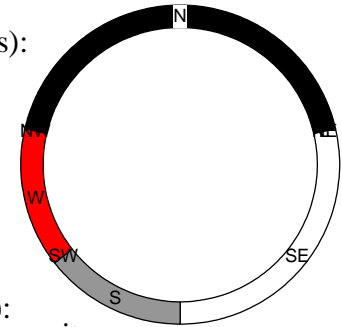
**Soil Colour** (9 records):

67% black, 11% brown, 11% grey, 11% red.

**Geology** (3 records):

67% basalt, 33% granite.

**Vegetation** (9 records): 89% grassland, 11% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable D2(i,ii). Occurrence: 3 km<sup>2</sup>; Occupancy: 3km<sup>2</sup>.

Fragmentation index meaningless.

**Nature Reserves** (9 records): 100% in nature reserves - well conserved.

**Habitat destruction** (9 records):

100% extensive natural habitat.

**Alien Invasive Species** (9 records): 78% none, 22% *Pinus*.

**Alien Density** (9 records): 78% alien-free, 22% sparse.

**Cultivation & Utilization:**

**Picking** (7 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

Plants did not look at all happy: stunted and doubtful if they flowered more than once every three or four years - Incredible that they have survived in such conditions. And how on earth did they get here in the first place? (PVR96061703)

**Confusing Species:** None.

**Variation and Taxonomy:** Rourke sank this into *P. dracomontana*, but Beard strongly disagrees. The two species are so isolated it makes little sense to regard them as the same species. *P. inyanganiensis* is smaller in all its features (habit, leaves, flowerheads, floral parts). The perianth parts of *P. inyanganiensis* are also much less hairy

**Distribution:** Add.

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*Protea nubigena* Rourke 1978  
**Cloud Sugarbush**  
*Wolkesuikerbos*

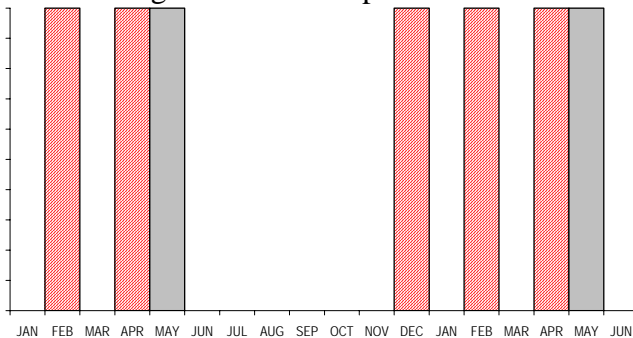
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**5 Records**

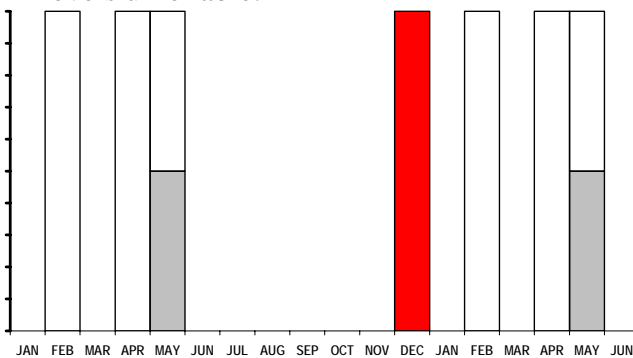
**Population** (5 records): 100% Frequent.

**Dispersion** (5 records): 100% clumped.

**Flowering** (4 records with: Jan 0, Feb 1, Mar 0, Apr 1, May 1, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 0, Dec 1): Buds from Dec to Apr; Flowering, Peak Flowering, Over and Nothing not recorded; Fruit from May. Peak levels unreliable. Historically recorded as flowering from Mar to Apr.



**Growth** (5 records with: Jan 0, Feb 1, Mar 0, Apr 1, May 2, Jun 0, Jul 0, Aug 0, Sep 0, Oct 0, Nov 0, Dec 1): Much recorded in Dec; Rare in May; None from Feb to May. Peak levels unreliable.



**Seedlings** (1 record): All without any seedlings present.

**Fire Survival** (1 record): 100% resprouted from underground boles.

**Age to first flowering:** First flowers recorded at 1 year at 100%.

**Height** (5 records): 100% 0.2-1 m tall.

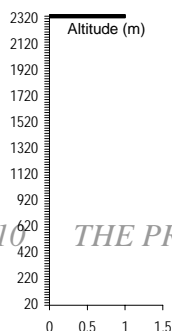
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (5 records): 100% inland - further than 2 km from coast.

**Altitude** (5 records): 2280 - 2440 m; 2300<sub>lq</sub> - 2320<sub>med</sub> - 2320<sub>uq</sub> m.



**Landform** (5 records): 60% shallow soil, 20% rocky outcrops, 20% deep soil.

**Slope** (5 records): 100% cliff.

**Aspect** (5 records): 90% South, 10% East.

**Soil Type** (4 records):

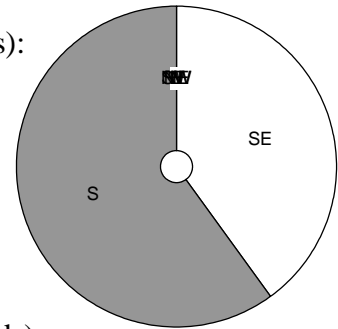
50% loamy,  
 25% peaty,  
 25% rocky.

**Soil Colour** (5 records):

60% black,  
 40% brown.

**Geology** (5 records): 100% basalt.

**Vegetation** (4 records): 75% grassland, 25% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Critically Endangered B1a(ii)b(v)+2a(ii)b(v), D.

**Occurrence:** 1km<sup>2</sup> with 100% conserved and 0% lost; **Occupancy:** 3 km<sup>2</sup> with 100% conserved and 0% lost. Fragmentation index: meaningless.

**Nature Reserves** (5 records): 100% in nature reserves - well conserved.

**Habitat destruction** (5 records): 60% extensive natural habitat, 20% islands, 20% naturally linear habitats.

**Alien Invasive Species** (5 records): 100% none.

**Alien Density** (5 records): 100% alien-free.

**Cultivation & Utilization:**

**Picking** (3 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

I left the flowering code blank as all plants except for one were killed above ground by that fire. I did not see any seedlings - there may have been some but the terrain is so inaccessible - resprouting was not too extensive and produced shoots 120-260 mm (ITP92051501);

The plants on lower side of population had been burnt by a lightning fire in July of 1995 - these few plants had released seed and started resprouting (NSC95122917);

We were escorted to the site by parks board field guards: very difficult to count exact numbers due to location but guard feels there has been an increase in pop since his last visit (OUTY0052102);

No pollinators (too late in season) but in 1991 I collected Coleoptera - Cryptophagidae (2 spp); Nitidulidae (*Meligether* sp); Diptera: Chloropidea; Hymenoptera; Apidea (*Apis mellifera*) And Also Thysanoptera (*Chirothrips pretorianus* -thripidae) (OUTY0052102);

**Confusing Species:** None.

Records of identification queries = 1.

**Variation and Taxonomy:** No variation noted.

**Distribution:** Add.

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*Protea parvula* Beard 1958  
**Dainty Sugarbush**  
*Kleinsuikerbos*

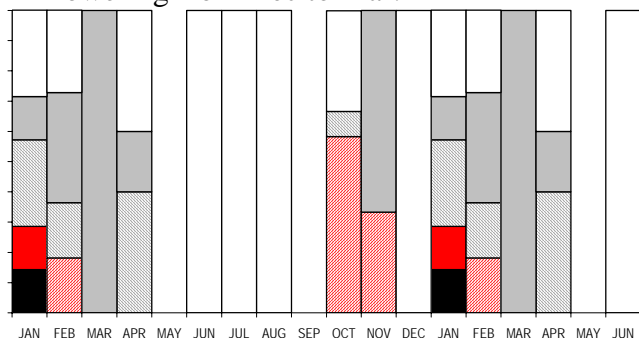
**Other Common Names:** None known.  
**Other Scientific Names:** *None*.

**44 Records**

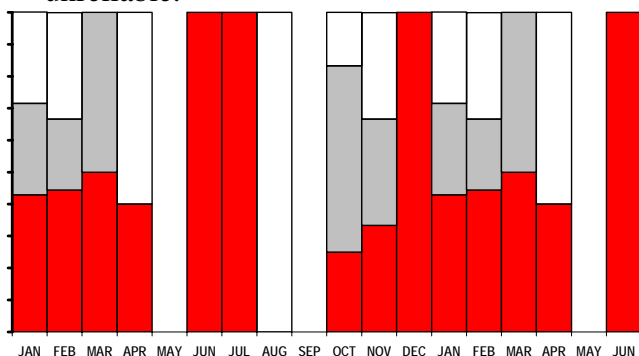
**Population** (44 records): 30% Common, 52% Frequent, 18% Rare.

**Dispersion** (43 records): 49% clumped, 40% variable, 9% widespread, 2% evenly distributed.

**Flowering** (44 records with: Jan 7, Feb 11, Mar 2, Apr 5, May 0, Jun 1, Jul 1, Aug 1, Sep 0, Oct 12, Nov 3, Dec 1): Buds from Oct to Nov; Flowering and Peak flowering not significant from Jan; Over from Jan and Apr; Fruit from Feb to Apr and Nov; Nothing from Dec to Oct. Peak levels unreliable at 57% in Jan. Historically recorded as flowering from Dec to Mar.



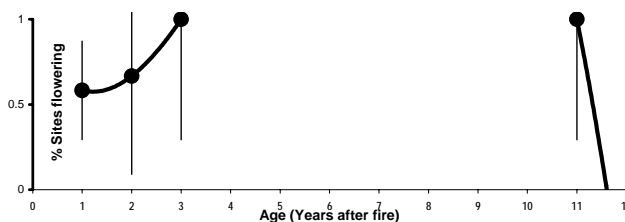
**Growth** (42 records with: Jan 7, Feb 9, Mar 2, Apr 5, May 0, Jun 1, Jul 1, Aug 1, Sep 0, Oct 12, Nov 3, Dec 1): Much from Oct to Jul; Rare from Jan to Mar and Oct to Nov; None from Jan to Feb, Apr and Nov. Peak levels unreliable.



**Seedlings** (18 records): Absent in 56%: fewer seedlings than prefire adults in 4 cases. Seedlings found in Jan (2), Apr and Oct.

**Fire Survival** (25 records): 80% resprouted from underground boles, 12% escaped fires in fire-safe areas, 8% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100% recorded at 3 years.



**Height** (44 records): 93% 0-0.2 m tall, 5% 0.2-1 m tall, 2% 2-5 m tall.

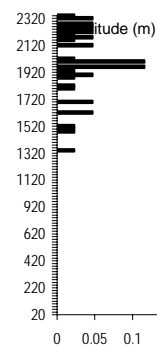
**Pollinators** (6 records): 50% bees or wasps, 33% beetles, 17% butterflies or moths.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (43 records): 100% inland - further than 2 km from coast.

**Altitude** (43 records): 1220 - 2240 m; 1760 *lq* - 1900 *med* - 2020 *uq*m.



**Landform** (43 records): 44% shallow soil, 40% deep soil, 16% rocky outcrops.

**Slope** (43 records): 67% gentle incline, 16% steep incline, 12% hill top, 5% platform.

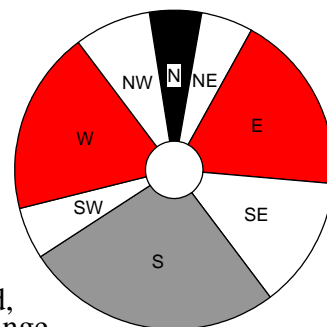
**Aspect** (38 records): 36% South, 29% East, 24% West, 12% North.

**Soil Type** (41 records): 71% loamy, 22% sandy, 5% clayey, 2% rocky.

**Soil Colour** (43 records): 74% brown, 14% grey, 7% red, 2% black, 2% orange.

**Geology** (18 records): 50% sandstone, 22% granite, 17% dolerite, 6% conglomerate, 6% shale.

**Vegetation** (42 records): 93% grassland, 5% shrubland, 2% wooded grassland.



**Conservation Status and Threat:**

Red Data List Status: Near Threatened A2c, but Vulnerable D2(ii) in Swaziland.

Occurrence: 16 838 km<sup>2</sup> with 2% conserved and 37% lost; Occupancy: 518 km<sup>2</sup> with 8% conserved and 2% lost. Fragmentation index: 9%.

**Nature Reserves** (43 records): 26% in nature reserves.

**Habitat destruction** (40 records): 63% extensive natural habitat, 15% islands, 10% naturally linear habitats, 8% naturally fragmented habitats, 3% road verges, 3% corridors.

**Alien Invasive Species** (39 records):  
41% *Pinus*, 38% none, 21% Fabaceae  
(chiefly alien *Acacia*).

**Alien Density** (39 records): 38% alien-free,  
49% sparse, 5% abundant, 8% dense.

**Cultivation & Utilization:**

**Picking** (28 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

**Fire survival**

The plants grow out of a huge rootstock just  
above ground level with creeping stems that  
are coloured red above (JAH93072101);

In places where plants protected from fire I  
observed buds - otherwise new shoot growth  
from large patches of rootstock up to 1m in  
diameter (JCM95103001);

Only one plant was found flowering where  
trailing stems had extended over sheetrock  
thereby escaping fire and permitting  
flowering (JEB92010101);

From observation plants only flower on stems  
more than one year old and therefore annual  
burning (*i.e.* on forestry firebreaks) inhibits  
flowering: biennial burning permits  
flowering (JEB92010102);

**Pollination**

1 butterfly (*Junonia* Sp). small wasps.  
Coleoptera (2 Spp) and 1 small fly  
(JEB92010102); Bees are present on most of  
flowerheads (RGR93041401);

**Distribution**

Only on hilltop (AMMY0021303);

Occurs in a 30m wide strip all along and on  
either side of an airstrip (Used by SAPPI for  
firefighting in the pine plantations)  
(JOOY1022401);

This small population is most remnant pop  
lying on edge of opencast mine - mine in  
operation and more plants were seen in the  
area previously (LSB93011901);

**Confusing Species:** The only prostrate protea  
in the region.

Records of identification queries = 4.

**Variation and Taxonomy:** No variation  
recorded.

**Distribution:** Add.

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***Protea simplex* Phill. 1910**  
**Dwarf Grassveld Sugarbush**  
*Slanksuikerbos*

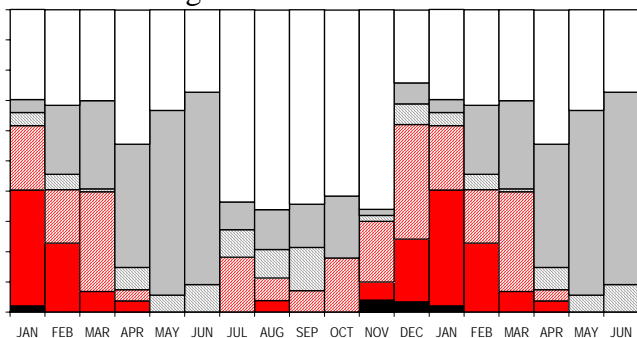
**Other Common Names:** Mountain Rose.  
**Other Scientific Names:** *doddii* Phill 1910, *flanaganii* Phill 1910, *transvaalensis* Phill 1910.

**506 Records**

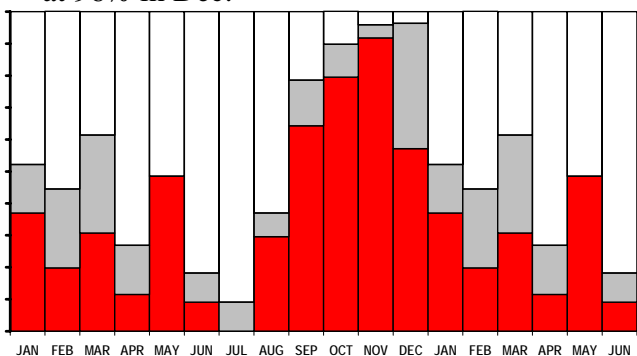
**Population** (500 records): 8% Abundant, 26% Common, 47% Frequent, 20% Rare.

**Dispersion** (476 records): 46% variable, 26% widespread, 19% clumped, 9% evenly distributed.

**Flowering** (499 records with: Jan 47, Feb 79, Mar 103, Apr 27, May 36, Jun 11, Jul 11, Aug 53, Sep 14, Oct 39, Nov 50, Dec 29): Buds from Nov to Jan and Mar; Flowering from Dec to Feb; Peak Flowering and Over not significant; Fruit from Feb to Jun and Oct; Nothing from all year round. Peak levels at 69% in Dec. Historically recorded as flowering from Nov to Dec.



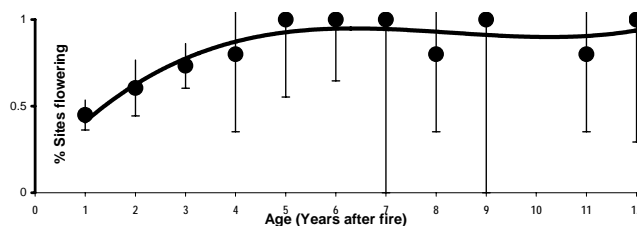
**Growth** (493 records with: Jan 46, Feb 81, Mar 101, Apr 26, May 33, Jun 11, Jul 11, Aug 54, Sep 14, Oct 39, Nov 49, Dec 28): Much from Aug to Mar and May; Rare from Feb to Mar and Dec; None from Jan to Sep. Peak levels at 96% in Dec.



**Seedlings** (301 records): Absent in 91%; fewer seedlings than prefire adults in 10 cases, and more in 4 cases. Seedlings found in Jan (4), Feb, Aug, Sep, Oct (3), Nov (2) and Dec (2).

**Fire Survival** (304 records): 88% resprouted from underground boles, 9% escaped fires in fire-safe areas, 1% survived by seedlings only, 1% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1-2 years, and 100% recorded at 5 years.



**Height** (499 records): 40% 0-0.2 m tall, 57% 0.2-1 m tall, 3% 1-2 m tall.

**Pollinators** (37 records): 70% beetles, 11% birds, 8% flies, 5% none observed, 3% butterflies or moths, 3% bees or wasps.

**Detailed Pollinators** (7 records): Great Protea Beetle (3), Malachite Sunbird (2), Scarab Beetle, Monkey Beetle.

**Habitat:**

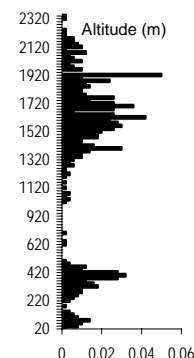
**Distance to Ocean** (502 records): 95% inland - further than 2 km from coast.

**Altitude** (502 records): 20 - 2300 m; 460 *lq* - 1460 *med* - 1620 *uq* m.

**Landform** (496 records): 48% deep soil, 36% shallow soil, 12% rocky outcrops, 2% swamp, 1% riverine, 1% lake edge.

**Slope** (498 records): 44% gentle incline, 27% steep incline, 18% hill top, 8% platform, 1% valley bottom, 1% cliff.

**Aspect** (422 records): 30% South, 27% West, 25% East, 18% North.

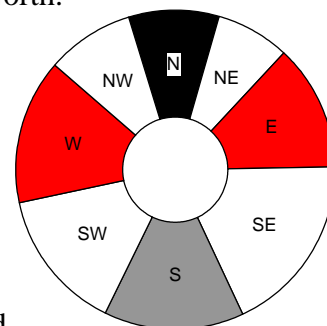


**Soil Type** (494 records): 63% loamy, 26% sandy, 5% clayey, 4% gravelly, 3% rocky.

**Soil Colour** (494 records): 57% brown, 29% grey, 4% red, 4% black, 4% yellow, 2% orange.

**Geology** (396 records): 68% sandstone, 9% basalt, 8% granite, 7% dolerite, 6% shale, 2% Tertiary sands.

**Vegetation** (491 records): 81% grassland, 9% wooded grassland, 9% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern but Vulnerable D2(ii) in Limpopo

Occurrence: 255 475 km<sup>2</sup> with 2% conserved and 21% lost; Occupancy: 720 km<sup>2</sup> with 33% conserved and 14% lost. Fragmentation index: 0.003%.



**Nature Reserves** (502 records): 62% in nature reserves - well conserved.

**Habitat destruction** (428 records): 78% extensive natural habitat, 10% islands, 8% naturally linear habitats, 2% naturally fragmented habitats, 1% corridors.

**Alien Invasive Species** (435 records): 66% none, 15% Fabaceae (chiefly alien *Acacia*), 13% *Pinus*, 2% *Hakea*, 2% Myrtaceae, 2% other aliens.

**Alien Density** (435 records): 66% alien-free, 27% sparse, 4% abundant, 3% dense.

### **Cultivation & Utilization:**

**Picking** (351 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

### **Atlasers Notes:**

#### **Size**

In spite of the Nicholas rule that HC1 is reserved for ground proteas the height of these dwarfs were 1 (AWA95052502); One plant was 2 m tall (PAN92122801);

Robust and with no frost die-back making it difficult to distinguish from young *P. caffra* (DFJ99081802); A very robust form – with strange multiple headed flowerheads and multiple buds (DFJ99081910); More normal but still robust in form (DFJ99081911); Mainly normal (non-robust) with typical Frost-dead branches (DFJ99081912);

#### **Flowering and growth**

At all stages of flowering and are mostly at periphery of site where rocks are less (BRB96031001); Only some bushes with small buds - buds appear small for secondary flowering season (CVV95111901); One flower was seen with many buds dead (CVV97070802); Buds just starting to form - late due to altitude? (JCM92121403); Main flowering time end of november; a few flowers still amongst many closed seed heads; no seedlings (PAN97123101); Occasional flowerhead (SRIY0052301);

Good new growth on some bushes (CVV95111901);

#### **Resprouting**

Straight stems ex rootstock (AJT98061404); Most of dwarf proteas are brown after month old fire but plenty escaped - no time yet for resprouting (AWA95052502); Note that the area has been burned every year for the last four years and new growth has been detected - no old parts have been seen - destroyed in the fire (CDB99082302); Resprouting well after very recent fire (PAN94092501); Resprouting vigorously after fire (PAN94092502); healthy population after fire (PAN95123105); Resprouted after fire four years ago (PAN97123101);

It is very difficult for me to tell whether there are seedlings or the plants have just started resprouting from the rootstock (BRB98052302); Very small plants but sprouts not seedlings I think (PAN99070601);

#### **Browsing**

Population appears to be grazed by cattle (APE93021301); Grazing animals tend to

defoliate these plants (JCM92121502); Subject to defoliation from grazing animals - this also applies to seedlings of other species (JCM92121503);

#### **Mortality**

Many appear to be dying (AJT94061104); Rare - scattered – weak. incorrect burning? (ATA94112101+03); Getting smaller and less evident (BRB96102605); Lots of die - back towards bottom of plants (CVV97070801); A Few tall bushes appear not to be affected by die back (frost or snow?) (CVV97070802); Not in good health (NSC95012402); Very shabby, few buds (PAN99103001);

Healthy population in lightly grazed grassland (PAN93112002); Widespread and healthy (PAN98030401); Very healthy (PAN98080801);

Numerous but not healthy (PAN99103001);

#### **Population size**

Only 18 plants (APE95020301); 15 plants in 2 pops (INAY0010801); 12 plants in clump (INAY0010802); Only 2 seen (PAN92052802);

About 50 scattered plants not vigorous - drought stressed? (NJH93091102);

#### **Alien competition**

The few survivors here are badly threatened by the aliens (JCM93092404); Plants sickly - under threat from aliens (PAN92122804); Healthy single survivors of Blackwood attack (PAN95123002); Being smothered by aggressive Hakeas (PAN98030402); Choked by Watsonias (PANY0061801);

#### **Pollination**

Beetles in flowers when the flowers are deemed over (NSC95021103); Yellow beetle with black spots (PAN93010101); Ants (WEL95012903);

#### **Distribution**

At higher levels - the most common protea on slopes within forest dept - none whatsoever across fence on Farm Camp Ailsa Annexe - due to sheep grazing for last 100 years (JCM92011201);

**Confusing Species:** There is considerable variation in shape of leaves and occasionally hybrids with *P. caffra* occur resulting in some confusion. The thin, unbranched stems and annual frost-mortality of the leaves contrasts strongly with *P. dracomontana*.

Records of identification queries = 41.

Records of corrected identification queries = 1.

**Variation and Taxonomy:** Leaves vary in size and shape from linear to narrowly oblong or oblanceolate.

Beard regarded the northern populations, with more robust features, as a distinct species from those in KwaZulu-Natal.

**Distribution:** Add.

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*Protea comptonii* Beard 1958  
**Saddleback Sugarbush**  
*Comptonia suikerbos*

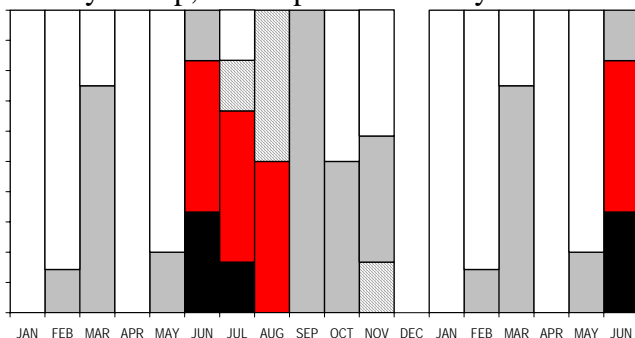
**Other Common Names:** Barberton-mountain Sugarbush, *Barbertonseberg-suikerbos*.  
**Other Scientific Names:** None.

**55 Records**

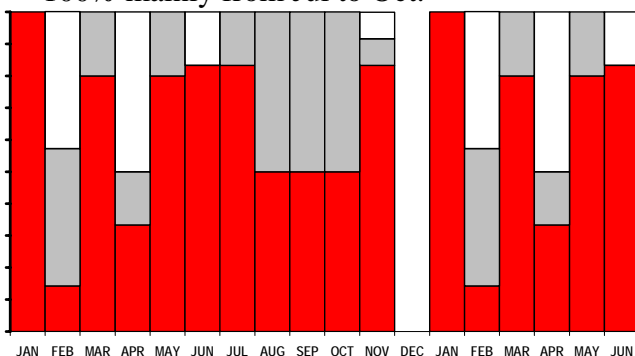
**Population** (55 records): 16% Common, 69% Frequent, 15% Rare.

**Dispersion** (53 records): 43% variable, 28% clumped, 17% widespread, 11% evenly distributed.

**Flowering** (52 records with: Jan 1, Feb 7, Mar 4, Apr 5, May 5, Jun 6, Jul 6, Aug 2, Sep 2, Oct 2, Nov 12, Dec 0): Buds not recorded; Flowering from Jun to Aug; Peak Flowering from Jun; Over from Aug; Fruit from Mar, May and Sep to Nov; Nothing from Jan to May and Oct to Nov. Peak levels at 100% in Jun. Historically recorded as flowering from May to Sep, with a peak from May to Jul.



**Growth** (54 records with: Jan 1, Feb 7, Mar 5, Apr 6, May 5, Jun 6, Jul 6, Aug 2, Sep 2, Oct 2, Nov 12, Dec 0): Much from Mar to Jan; Rare from Feb to Mar, May and Aug to Oct; None from Feb and Apr. Peak levels at 100% mainly from Jul to Oct.



**Seedlings** (22 records): Absent in 36%; fewer seedlings than prefire adults in 6 cases, and more in 1 case. Seedlings found in Feb, May, Jun (2), Jul (2) and Aug.

**Fire Survival** (38 records): 58% resprouted from aerial trunks, 26% escaped fires in fire-safe areas, 13% resprouted from underground boles, 3% eliminated from the area by fires.

**Age at first flowering:** First flowers recorded at 1 year, 50% estimated at 1 year, and 100%

recorded at 4 years. No data for veld older than 5 years.



**Height** (55 records): 5% 0.2-1 m tall, 11% 1-2 m tall, 78% 2-5 m tall, 5% taller than 5 m.

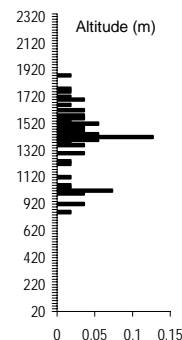
**Pollinators** (11 records): 45% bees or wasps, 27% birds, 18% flies, 9% beetles.

**Detailed Pollinators** (1 record): Shelley's Sunbird.

**Habitat:**

**Distance to Ocean** (55 records): 100% inland - further than 2 km from coast.

**Altitude** (55 records): 740 - 1780 m; 1120 *lq* - 1320 *med* - 1360 *uq* m.



**Landform** (55 records): 45% shallow soil, 31% deep soil, 24% rocky outcrops.

**Slope** (55 records): 84% steep incline, 9% gentle incline, 4% cliff, 4% hill top.

**Aspect** (53 records): 30% South, 26% East,

25% West, 19% North.

**Soil Type** (55 records):

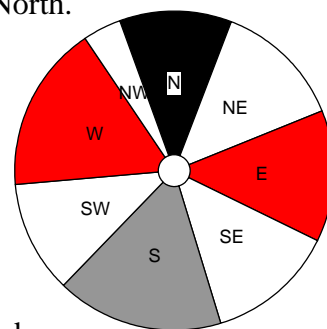
60% loamy, 22% sandy, 13% rocky, 4% gravelly, 2% clayey.

**Soil Colour** (55 records):

55% brown, 25% grey, 16% red, 2% black, 2% yellow.

**Geology** (32 records): 59% sandstone, 13% conglomerate, 9% shale, 6% dolerite, 6% granite, 3% limestone, 3% basalt.

**Vegetation** (55 records): 51% wooded grassland, 40% grassland, 5% shrubland, 4% woodland.



**Conservation Status and Threat:**

**Red Data List Status:** Near Threatened A2c; Endangered A2c, B1a(i,ii)b(i,ii,iv,v)+2a(i,ii)b(i,ii,iv,v) in KwaZulu-Natal and Vulnerable D1+2(ii) in Swaziland.

Occurrence: 6 752 km<sup>2</sup> with 5% conserved and 31% lost; Occupancy: 123 km<sup>2</sup> with 19%

conserved and 13% lost. Fragmentation index: 2%.

**Nature Reserves** (55 records): 49% in nature reserves.

**Habitat destruction** (53 records):

77% extensive natural habitat, 15% islands, 4% corridors, 4% naturally linear habitats.

**Alien Invasive Species** (51 records): 59% none, 22% *Pinus*, 18% Fabaceae (chiefly alien *Acacia*), 2% Myrtaceae.

**Alien Density** (51 records): 59% alien-free, 37% sparse, 4% abundant.

**Cultivation & Utilization:**

**Picking** (40 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

In full flower on 8 August 1993 (JEB93021201);

Very little recruitment! (AGR98111829);

With many juveniles (LOT94110901-2);

Half of old plants are dead - is natural (ITA95032701);

Total number of plants in Malolotja is 53 plants: half plants small and other half in flower (LDM98111101); Total of 185 specimens

counted at Mgwisa Forest in Malolotja (LDMY0021304);

Confined to ridge at base above cliffs (AGR98111111); Associated with chert outcrops - Barberton Greenstone (AJM99071401);

Each tree has an aluminium number plate (LOT94111102);

**Confusing Species:** None, largely due to the large leaves and robust flowerheads. Mistaken for *P. welwitschii* and *P. rubropilosa* when young.

Records of identification queries = 4.

Records of corrected identification queries = 2.

**Variation and Taxonomy:** No variation recorded, specifically nothing obvious between the northern and southern populations.

**Distribution:** Add.

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*Protea curvata* Brown 1901  
**Barberton Sugarbush**  
*Laeveldsuikerbos*

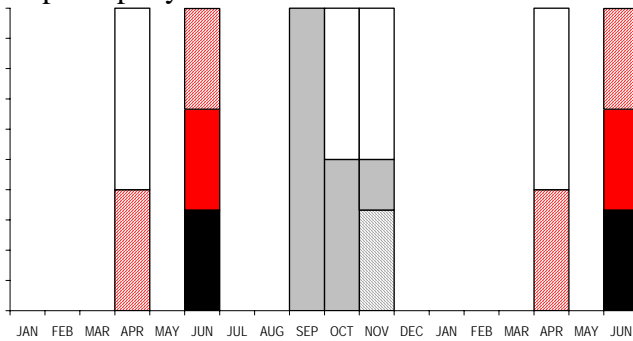
**Other Common Names:** Barberton-lowveld Sugarbush, *Barbertonselaeveldsuikerbos*.  
**Other Scientific Names:** None.

**17 Records**

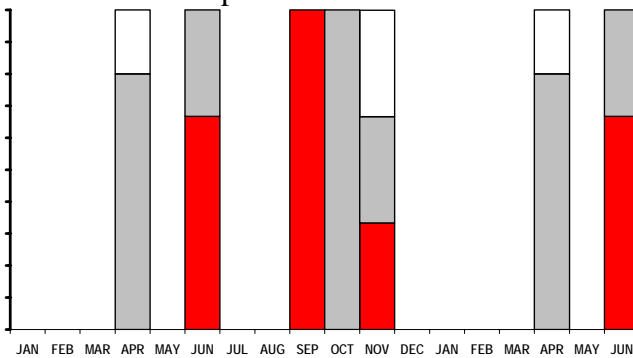
**Population** (17 records): 65% Common, 35% Frequent.

**Dispersion** (17 records): 71% variable, 18% widespread, 6% evenly distributed, 6% clumped.

**Flowering** (17 records with: Jan 0, Feb 0, Mar 0, Apr 5, May 0, Jun 3, Jul 0, Aug 0, Sep 1, Oct 2, Nov 6, Dec 0): Buds from Apr to Jun; Flowering from Jun; Peak Flowering from Jun; Over from Nov; Fruit from Sep to Oct; Nothing from Oct to Apr. Peak levels unreliable at 100% in June. Historically recorded as flowering from Jun to Oct, principally Jun to Jul.



**Growth** (17 records with: Jan 0, Feb 0, Mar 0, Apr 5, May 0, Jun 3, Jul 0, Aug 0, Sep 1, Oct 2, Nov 6, Dec 0): Much from Jun to Nov; Rare from Apr, Jun and Oct to Nov; None from Apr and Nov. Peak levels unreliable at 100% in Sep.



**Seedlings** (10 records): Absent in 60%; fewer seedlings than prefire adults in 2 cases. Seedlings found in Jun.

**Fire Survival** (7 records): 71% escaped fires in fire-safe areas, 29% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 3 years at 100%.



**Height** (17 records): 100% 2-5 m tall.

**Pollinators** (3 records): 33% birds, 33% bees or wasps, 33% flies.

**Detailed Pollinators:** No additional data.

**Habitat:**

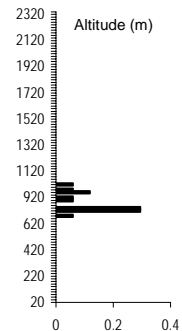
**Distance to Ocean** (17 records): 100% inland - further than 2 km from coast.

**Altitude** (17 records): 660 - 920 m; 700<sub>lq</sub> - 720<sub>med</sub> - 720<sub>uq</sub>m.

**Landform** (17 records): 53% deep soil, 29% shallow soil, 18% rocky outcrops.

**Slope** (17 records): 88% steep incline, 12% gentle incline.

**Aspect** (17 records): 79% South, 18% West, 3% East.

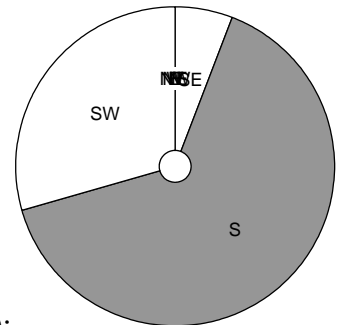


**Soil Type** (16 records): 75% loamy, 19% clayey, 6% sandy.

**Soil Colour** (17 records): 100% brown.

**Geology** (1 record): 100% sandstone.

**Vegetation** (17 records): 47% wooded grassland, 47% woodland, 6% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Vulnerable D2(i,ii).

Occurrence: 12 km<sup>2</sup> with 0% conserved and 2% lost; Occupancy: 22 km<sup>2</sup> with 0% conserved and 7% lost. Fragmentation index meaningless.

**Nature Reserves** (17 records): 0% in nature reserves - unconserved.

**Habitat destruction** (14 records): 86% extensive natural habitat, 7% islands, 7% naturally linear habitats.

**Alien Invasive Species** (15 records): 93% none, 7% Myrtaceae.

**Alien Density** (15 records): 93% alien-free, 7% sparse.

**Cultivation & Utilization:**

**Picking** (12 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlasers Notes:**

fire mismanagement coupled with severe drought pose potential threats for the population (SOK94060701); Extreme drought has caused death in many proteas but *P. curvata* coping well (CBE92102804); More on hill to East (CBE92102804); There are very many more of these proteas on the South West peak of the next high hill about 1 km north east of this locality (JCM93092502); A total population count was carried out: 65 plants were found including 5 senescent (SOK94060701); Number of plants in population estimated to be about 1500

(SOK94060702); Healthy large population (SOK94060801);

**Confusing Species:** Easily mistaken for the falcate form of *Protea caffra* when not in flower. However, its narrow distribution resulted in few misidentifications.

**Variation and Taxonomy:** None recorded.

**Distribution:** Add.

INCLUDEPICTURE

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*Protea rubropilosa* Beard 1958  
**Transvaal Sugarbush**  
*Transvaalbergsuikerbos*

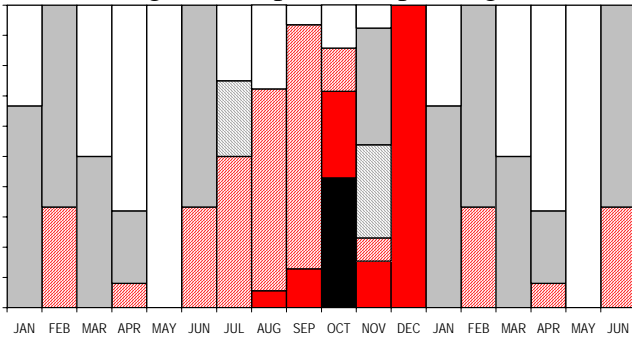
**Other Common Names:** Transvaal-mountain Sugarbush, Velvet Sugarbush.  
**Other Scientific Names:** *None*.

**117 Records**

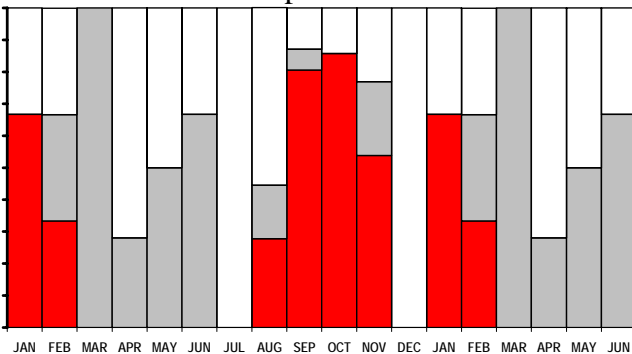
**Population** (116 records): 28% Common, 62% Frequent, 9% Rare.

**Dispersion** (109 records): 49% variable, 32% clumped, 18% widespread, 0.9% evenly distributed.

**Flowering** (112 records with: Jan 3, Feb 3, Mar 2, Apr 25, May 2, Jun 3, Jul 4, Aug 18, Sep 31, Oct 7, Nov 13, Dec 1): Buds from Feb and Jun to Sep; Flowering from Oct and Dec; Peak Flowering from Oct; Over from Jul and Nov; Fruit from Nov to Jun; Nothing from Jan, Mar to May and Jul to Aug. Peak levels at 94% in Sep. Historically recorded as flowering from Sep to Dec, peaking in Oct.



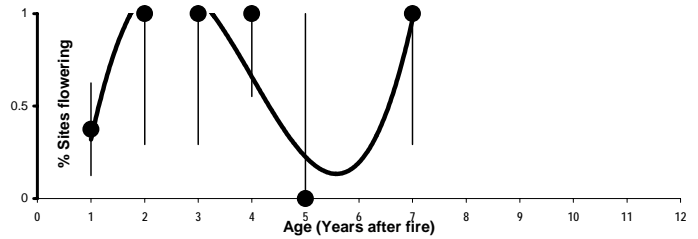
**Growth** (113 records with: Jan 3, Feb 3, Mar 3, Apr 25, May 2, Jun 3, Jul 4, Aug 18, Sep 31, Oct 7, Nov 13, Dec 1): Much from Aug to Feb; Rare from Feb to Jun and Nov; None from Nov to Feb and Apr to Aug. Peak levels at 87% in Sep.



**Seedlings** (33 records): Absent in 94%; fewer seedlings than prefire adults in 1 case. Seedlings found in Jun.

**Fire Survival** (48 records): 69% escaped fires in fire-safe areas, 25% resprouted from aerial trunks, 4% resprouted from underground boles, 2% eliminated from the area by fires.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 1-2 years, and 100% recorded at 2 years.



**Height** (114 records): 13% 0.2-1 m tall, 18% 1-2 m tall, 67% 2-5 m tall, 2% taller than 5 m.

**Pollinators** (1 record): butterflies or moths.

**Detailed Pollinators:** No additional data.

**Habitat:**

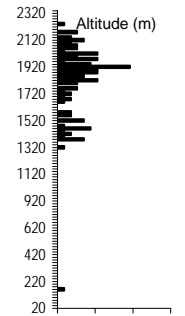
**Distance to Ocean** (113 records): 100% inland - further than 2 km from coast.

**Altitude** (113 records): 1200 - 2140 m; 1600 *lq* - 1780 *med* - 1840 *uq*m.

**Landform** (113 records): 51% deep soil, 37% shallow soil, 11% rocky outcrops, 0.9% riverine.

**Slope** (113 records): 49% steep incline, 34% gentle incline, 12% hill top, 5% cliff.

**Aspect** (102 records): 35% South, 29% North, 22% East, 15% West.

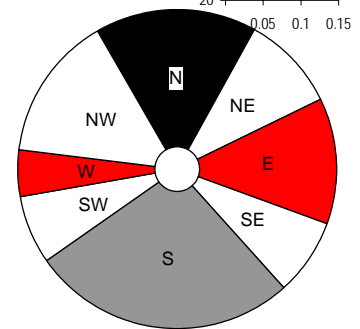


**Soil Type** (108 records): 75% loamy, 22% sandy, 2% gravelly.

**Soil Colour** (105 records): 72% brown, 18% grey, 7% red, 2% orange, 1% black.

**Geology** (63 records): 90% sandstone, 5% shale, 5% granite.

**Vegetation** (113 records): 49% wooded grassland, 46% grassland, 4% shrubland.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence: 10 699 km<sup>2</sup> with 10% conserved and 25% lost; Occupancy: 144 km<sup>2</sup> with 51% conserved and 10% lost. Fragmentation index: 1%.

**Nature Reserves** (113 records): 49% in nature reserves.

**Habitat destruction** (112 records): 91% extensive natural habitat, 4% islands, 3% naturally linear habitats, 3% naturally fragmented habitats.

**Alien Invasive Species** (108 records): 74% none, 19% *Pinus*, 6% Fabaceae (chiefly alien *Acacia*).

**Alien Density** (108 records): 74% alien-free,  
23% sparse, 3% abundant.

**Cultivation & Utilization:**

**Picking** (85 records): 100% no sign of picking.

**Cultivation Status:** Plantings - 1 record  
(0.9%).

**Atlassers Notes:**

Two plants burnt dead in plot (LOTY0071502);

The fire must have been very hot at this site  
as there were about 5 dead trees  
(PAB98102902);

Population monitored by TPA Nature  
Conservation (JEB93062701);

Occurs in a belt at about 1900m to 1800m  
(TMS92101301);

**Confusing Species:** None noted.  
Records of identification queries = 2.

**Variation and Taxonomy:** None recorded.

**Distribution:** Add.

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***Oldenburgia grandis* (Thunb.) Baillon 1800, 1882 (Asteraceae)**  
**Rabbits Ears**

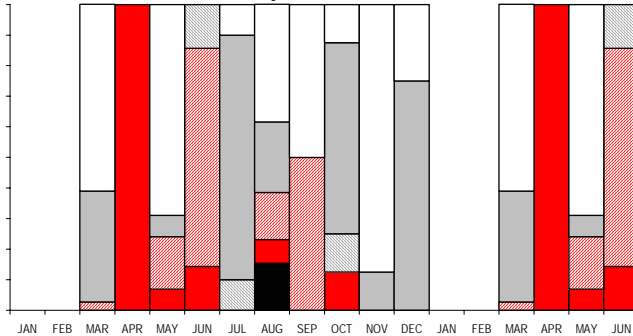
**Other Common Names:** *Bastersuikerbos*, *Kreupelboom*, *Lepelboom*, *Wagenboom*.  
**Other Scientific Names:** *arbuscula* De Candolle 1838.

**216 Records**

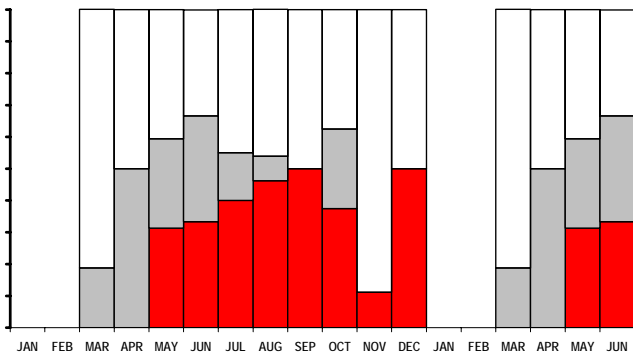
**Population** (215 records): 7% Common, 73% Frequent, 20% Rare.

**Dispersion** (195 records): 54% variable, 43% clumped, 3% widespread, 0.5% evenly distributed.

**Flowering** (206 records with: Jan 0, Feb 0, Mar 113, Apr 2, May 29, Jun 7, Jul 20, Aug 13, Sep 2, Oct 8, Nov 8, Dec 4): Buds from Jun and Sep; Flowering from Apr; Peak Flowering and Over not significant; Fruit from Mar, Jul to Aug, Oct, and Dec; Nothing from Mar, May, Aug to Sep, Nov to Dec. Peak levels at 100% in Apr and Jun. Historically recorded as flowering from October to January.



**Growth** (208 records with: Jan 0, Feb 0, Mar 112, Apr 2, May 32, Jun 6, Jul 20, Aug 13, Sep 2, Oct 8, Nov 9, Dec 4): Much from May to Oct and Dec; Rare from Apr to Jun and Oct; None from all year round. Peak levels at 67% in Jun.



**Seedlings** (84 records): Absent in 95%; fewer seedlings than prefire adults in 2 cases. Seedlings found in Aug and Oct.

**Fire Survival** (14 records): 57% escaped fires in fire-safe areas, 36% resprouted from underground boles, 7% resprouted from aerial trunks.

**Age to first flowering:** First flowers recorded at 1 year, 50% estimated at 2-3 years, and 100% recorded at 7 years.



**Height** (212 records): 9% 0.2-1 m tall, 72% 1-2 m tall, 19% 2-5 m tall.

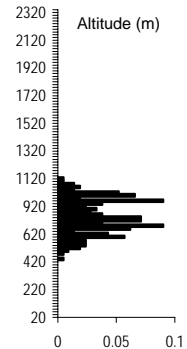
**Pollinators:** No data.

**Detailed Pollinators:** No additional data.

**Habitat:**

**Distance to Ocean** (211 records): 100% inland - further than 2 km from coast.

**Altitude** (211 records): 420 - 1020 m; 640<sub>lq</sub> - 720<sub>med</sub> - 780<sub>uq</sub> m.



**Landform** (211 records): 81% deep soil, 16% shallow soil, 3% rocky outcrops, 0.5% riverine.

**Slope** (210 records): 48% gentle incline, 37% steep incline, 12% hill top, 3% cliff, 0.5% platform.

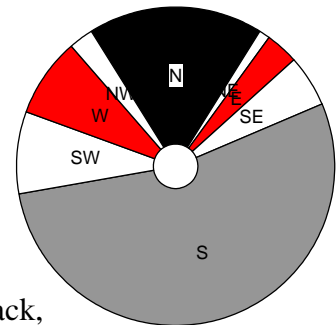
**Aspect** (190 records): 61% South, 20% North, 13% West, 6% East.

**Soil Type** (203 records): 78% loamy, 11% sandy, 6% clayey, 2% gravelly, 1% rocky.

**Soil Colour** (202 records): 69% brown, 26% grey, 3% black, 1.0% red.

**Geology** (202 records): 98% sandstone, 2% shale.

**Vegetation** (211 records): 62% shrubland, 33% grassland, 2% wooded grassland, 2% thicket, 0.5% forest, 0.5% plantations.



**Conservation Status and Threat:**

**Red Data List Status:** Least Concern.

Occurrence (Fynbos): 942 km<sup>2</sup> with 49% conserved; Occupancy: 290 km<sup>2</sup> with 38% conserved. Fragmentation index: 13%.

**Nature Reserves** (211 records): 40% in nature reserves.

**Habitat destruction** (209 records): 91% extensive natural habitat, 4% islands, 3% naturally fragmented habitats, 1.0% road verges, 1.0% naturally linear habitats.

**Alien Invasive Species** (205 records): 49% none, 20% Fabaceae (chiefly alien *Acacia*), 11% other aliens, 11% *Hakea*, 9% *Pinus*, 1.0% Myrtaceae.

**Alien Density** (204 records): 49% alien-free, 36% sparse, 8% abundant, 7% dense, 0.5% impenetrable.

**Cultivation & Utilization:**

**Picking** (151 records): 100% no sign of picking.

**Cultivation Status:** No noted cultivation.

**Atlassers Notes:**

Only 2 plants (NJH93081501); Total of about 50 plants (NJH93082601); About 500 plants (NJH93100301).

Lots of dead skeletons (AGRY1032809); Mostly growing from burnt stumps (fire about 4 years ago) (NJH93062401); 12 plants: 9 killed and 3 regenerating from rootstock (NJH93091401).

Confined to rocky outcrops (AGRY0070709, SGAY1032903); Only on steep West slope and on East cliffs (NJH93082601); Along ridge edges (East, South and West) at about

720 m altitude (NJH93100301); On south-facing slopes only (SGAY1032803); Cliffs covered with very big plants (VCHY0051205).

Many half leaves - cropped by cattle or horses? (NJH93081501).

**Confusing Species:** Add.

Records of identification queries = 2

**Variation and Taxonomy:** No variation known. This species was atlased as it was regarded as a "honorary Protea", and to see if it replaced *Protea nitida* as some people suggested.

**Distribution:** Add.

INCLUDEPICTURE

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