# BLACK KATY CHITON

## TAXONOMY

**Scientific name:** *Katharina tunicata* (Wood, 1815)
**Common name:** Black Katy chiton, Black leather chiton, Black chiton, Leather chiton
**Family**: Mopaliidae
**Genus Size:** One species (monotypic).

## DESCRIPTION

**Basic description:** A large black chiton.

**General description:**
Body consists of eight protective plates, firmly embedded in and considerably overlapped by the shiny black, tough, leathery girdle, often with encrusting algae or animals growing on them. Only a small diamond shaped portion of each plate is visible. The undersurface (large foot) is dull orange or yellowish, bordered by a row of gills on each side (O'Clair and O'Clair 1998, Field and Field 1999).

**Length (cm):** 13

**Reproduction:**
Sexual maturity at 35mm in length. Spawns in spring in the southern part of its range; during summer further north (e.g. in June on the outer coast of Vancouver Island, British Columbia). Females broadcast eggs (O'Clair and O'Clair 1998) after nearby males shed their sperm (Barr and Barr 1983). Settlement and metamorphosis can be induced by the encrusting coralline alga, *Lithothamnion* spp. Onset of gonadal growth in fall is triggered by declining water temperatures. Final gamete production in spring requires increasing water temperatures. Adults live to three years in California, perhaps longer in Alaska (O'Clair and O'Clair 1998).

**Ecology:**
Predators include humans, sea urchins, leather stars, Black Oystercatchers (*Haematopus bachmani*), and Glaucous-winged Gulls (*Larus glaucescens*; O'Clair and O'Clair 1998).

**Food:**
A moving grazer, diet varies regionally; eats many kinds of brown and red algae, including kelps, as well as sea lettuce (*Ulva*) and encrusting diatoms. Will also eat sponges, tiny barnacles, spirobid polychaetes and bryozoans (O'Clair and O'Clair 1998).

**Habitat:**
Intertidal to 40m (Slieker 2000). Common on rocky shores with heavy wave action (Field and Field 1999, Gallivan and Danforth 1999, Ruesink 2003), usually found on stony or rocky bottoms in the lower middle intertidal zone and the lower intertidal zone (van de Hoek 2002). In Three Saints Bay,

Kodiak Island, Alaska, favored habitats were crevices on vertical rock faces between individuals of barnacle *Balanus cariosus*, inside dead shells and on open rock surfaces (Nybakken 1969). Unlike most other chitons, *K. tunicata* tolerates direct sunlight (Nybakken 1969, O'Clair and O'Clair 1998, Field and Field 1999, van de Hoek 2002).

## STATUS

**Global rank:** G5 (2004-06-26)
**Global rank reasons:**
Global rank reasons currently unavailable.

**State rank:** S5 (2004-06-26)
**State rank reasons:**
Overall population and trends unknown, but apparently locally abundant and widespread. Threats include human harvest and contamination as a result of coastal development and oil spills. Effects of global warming on this species' habitat are unknown, but of concern.

## DISTRIBUTION AND ABUNDANCE

**Range:**
**Global range:**
Occurs from Kamchatka, Russia, through the Aleutian Islands, Alaska, to southern California (O'Clair and O'Clair 1998, Field and Field 1999, Slieker 2000).

**State range:**
Occurs from the Aleutian Islands, east and south throughout Southeast Alaska and Kodiak Island (Baxter 1987).

**Abundance:**
**Global abundance:**
A common inhabitant of middle to lower intertidal zones from Kamchatka, Russia and the Aleutian Islands, Alaska to Southern California (Field and Field 1999, Kozloff 2003).

**State abundance:**
One of the most abundant intertidal chitons in Alaska (N. Foster, pers. comm.).

**Trends:**
**Global trend:**
See State trend comments below.

**State trend:**
On the Kenai Peninsula, *K. tunicata* density and size structure differed among sites and among years (2001 – 2003). At two sites, densities increased over the course of the study, a trend that probably reflected local subsistence users' reluctance to harvest this species due to recent contamination concerns (Ruesink 2003).

## EXISTING PROTECTION

**Global protection:**
Protected under the Coastal Zone Management Act (CZMA) (NOAA 1996).

**State protection:**
Occurs in Kachemak Bay, a National Estuarine Research Reserve, and is protected by the Coastal Zone Management Act (CZMA) (NOAA 1996, Committee on Environment and Public Works 2000a, Alaska Dept. of Natural Resources 2004). The Outer Continental Shelf Lands Act (OCSLA) mandates that development of Outer Continental Shelf resources be balanced with protection of human, marine and coastal environments and any project that could adversely impact the coastal zone is subject to federal consistency requirements under the CZMA (Committee on Environment and Public Works 2000b).

## CHALLENGES

**Global challenges:**
Intertidal zones may be affected by industrial activities, such as timber harvest, oil and gas development, mining, and seafood processing. Coastal development, sewage discharge, harvest of intertidal species for food, and over-visitation resulting in trampling and collecting by beachcombers are also of concern (Tindall 2004). Natural perturbations such as earthquakes and scouring incurred by major storms threaten subtidal and intertidal communities. Though little understood, the effects of global warming will likely result in changes in intertidal community structure and diversity; in California, researchers have already noted a reduction in cold-water species in intertidal communities attributed to warming water temperatures (Tindall 2004).

**State challenges:**
Intertidal zones may be affected by industrial activities such as timber harvest, oil and gas development, mining, and seafood processing. Coastal development, sewage discharge, and over-visitation resulting in trampling and collecting by beachcombers are all of concern (Tindall 2004). Oil spills pose serious threats to slow moving or sessile coastal organisms (e.g. numerous intertidal organisms were killed and/or contaminated as a result of the *Exxon Valdez* oil spill; Varanasi et al. 1993). This species is taken as a subsistence food in numerous coastal communities throughout its range (Barr and Barr 1983, Field and Field 1999). In Bristol Bay, *K. tunicata* was harvested by as many as 100% of households surveyed in Ivanof Bay, 92.6% in Perryville, and 57.1% in Chignik Lake (Fall et al. 1996). In False Pass, Unimak Island, 75% of households harvested chitons (species not specified) for subsistence purposes (Fall et al. 1996). Natural perturbations such as earthquakes and scouring incurred by major storms adversely affect subtidal and intertidal communities. Though little understood, the effects of global warming will likely result in changes in intertidal community structure and diversity; in California, researchers have already noted declines in cold-water species in intertidal communities attributed to warming water temperatures (Tindall 2004).

## RESEARCH AND INVENTORY NEEDS

**Global research needs:**
See State research needs.

**State research needs:**
Effects of subsistence harvest, trampling, and over-visitation on localized populations and community structure needs study. Research needed to examine the influence of size structure of prey and competitor species, algal production and productivity, and predation by sea otters and sea stars. Effects of global warming on species dynamics needs study. Indigenous ecological knowledge needs to be summarized for this species.

**Global inventory needs:**
See State inventory needs.

**State inventory needs:**
An accurate assessment of population status range-wide is needed. Monitoring of localized populations should be initiated to assess long and short-term trends in abundance. Harvest surveys are needed to monitor extent of subsistence harvest on local populations.

## CONSERVATION AND MANAGEMENT NEEDS

**Global conservation and management needs:**
Intertidal areas receiving heavy human traffic should be conserved by restricting and/or monitoring access. Regulations of collections as a result of beachcombing should be developed.

**State conservation and management needs:**
Subsistence harvest should be monitored annually. In areas of high subsistence usage, population surveys are necessary to monitor stocks. Communication and collaboration with communities that use *K. tunicata* as a resource should be improved, and indigenous knowledge incorporated into management and decision making.

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