King County GIS and Urban Forestry

Dennis Higgins

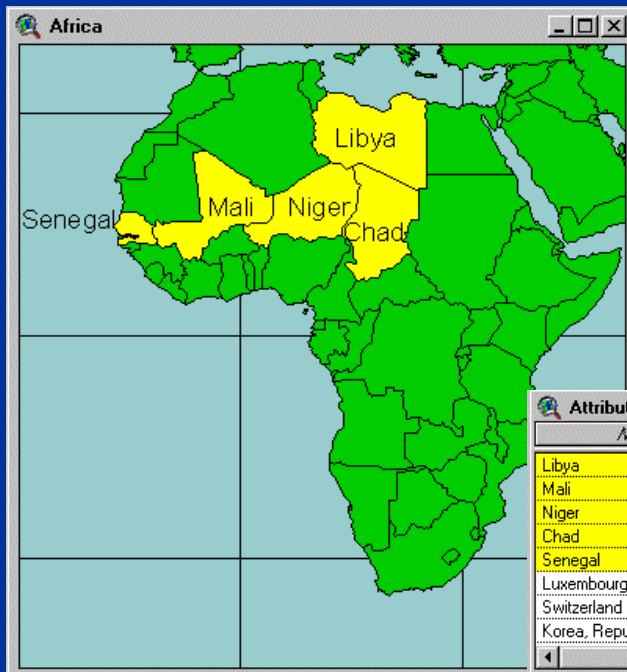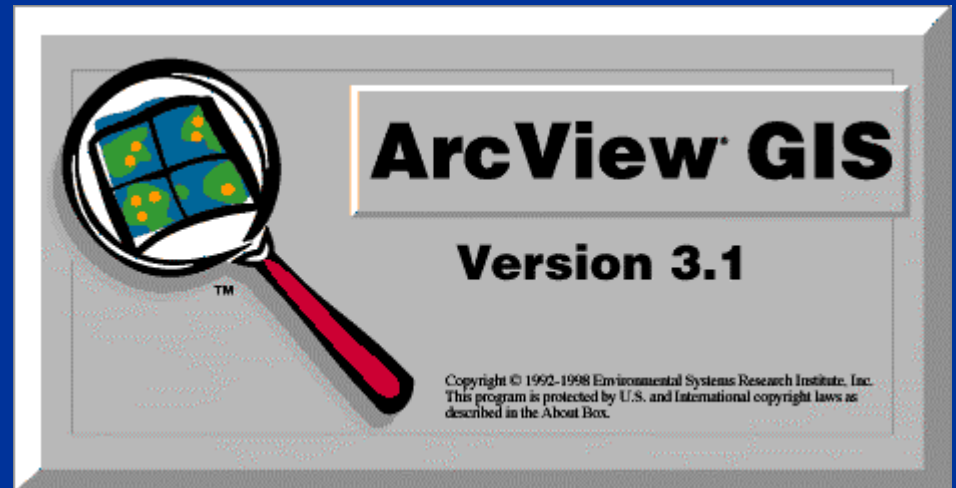**King County GIS Center**

Introduction

- Basics of Geographic Information Systems (GIS)

- A look at GIS in King County Government

- Benefits of GIS to Urban Forestry

- Examples of King County GIS use in Forestry and Urban Forestry

Basics of GIS

- Integration of maps, data, software tools, and people
- Spatial analysis
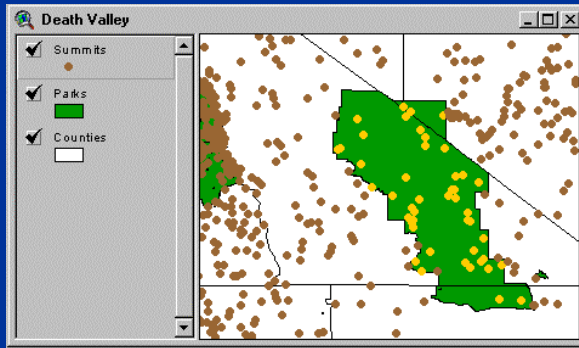- Modeling tools

GIS: Maps, Data, Software, and People

Spatial Analysis Tools
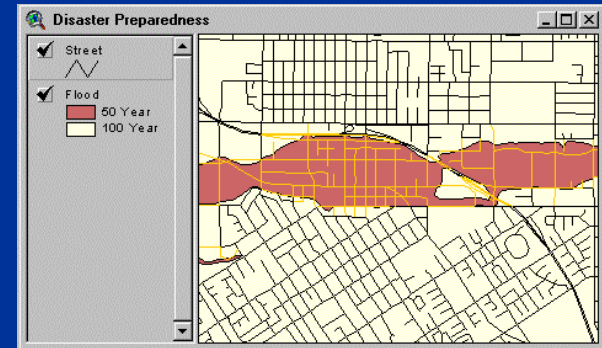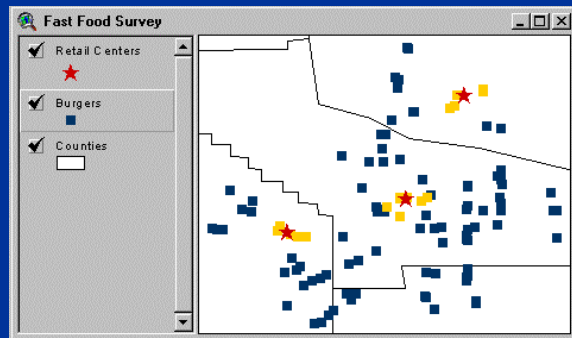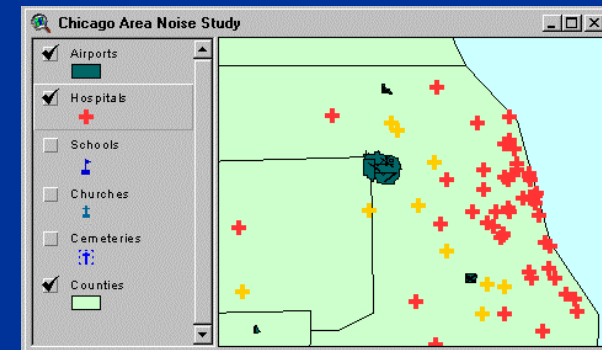
Modeling Tools

•**Orthographic Photography**
•**Land Cover Analyses**
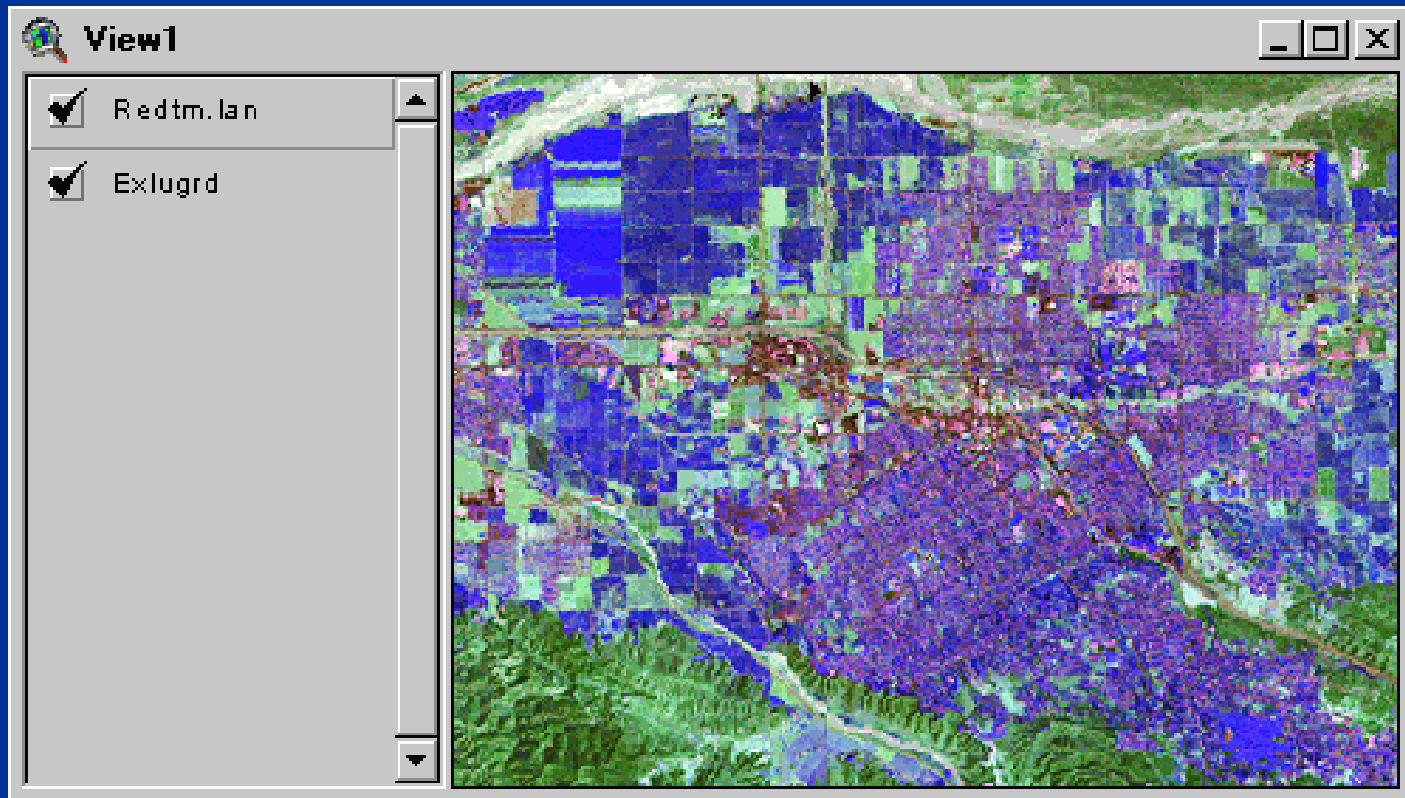
King County GIS Organization

- Many agencies performing GIS work (Assessor, Records and Elections, Parks, Transit, others)

- King County GIS Center - data development, applications, client services

King County GIS Organization

KC Assessor
Maintains:
1. Parcel Data
2. Parcel Annotation

DES
Maintains:
1. Election Districts
2. Voter Precincts

DDES
Maintains:
1. Comp Plan Zones
2. Land Use Zones
3. Hazard Zones
4. Wetlands

Posts Newly Maintained Data
Access all GIS Data

Posts Newly Maintained Data
Access all GIS Data

Posts Newly Maintained Data
Access all GIS Data

KCGIS Data Warehouse (Managed by KCGIS Center)

KCGIS Center DNRP GIS Unit
Maintains:
1. Hydrography
2. Sampling Sites
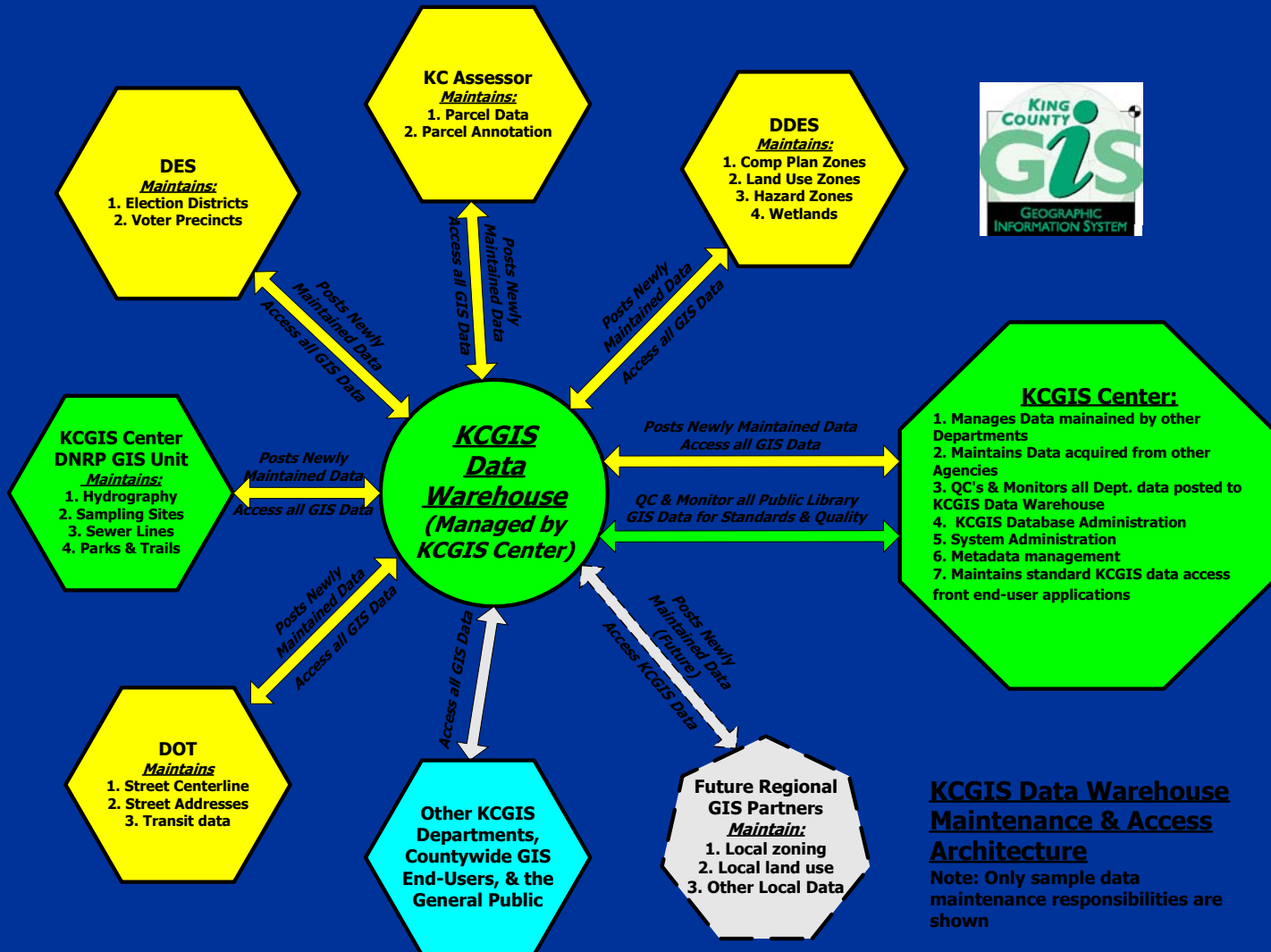3. Sewer Lines
4. Parks & Trails

Posts Newly Maintained Data
Access all GIS Data

Posts Newly Maintained Data
Access all GIS Data

KCGIS Center:
1. Manages Data mainained by other Departments
2. Maintains Data acquired from other Agencies
3. QC's & Monitors all Dept. data posted to KCGIS Data Warehouse
4. KCGIS Database Administration
5. System Administration
6. Metadata management
7. Maintains standard KCGIS data access front end-user applications

Posts Newly Maintained Data
Access all GIS Data

QC & Monitor all Public Library GIS Data for Standards & Quality

DOT
Maintains
1. Street Centerline
2. Street Addresses
3. Transit data

Other KCGIS Departments, Countywide GIS End-Users, & the General Public

Access all GIS Data

Future Regional GIS Partners
Maintain:
1. Local zoning
2. Local land use
3. Other Local Data

Posts Newly Maintained Data (Future)
Access KCGIS Data

KCGIS Data Warehouse Maintenance & Access Architecture
Note: Only sample data maintenance responsibilities are shown

King County GIS Center - Data Development

King County GIS Capital Project:

- **Assessor's Parcel Map Conversion (1995-1999)**
- **Street Addressing Layer Creation (2000)**
- **Data Warehouse Implementation**

Census Data Tiger File Conflation

King County GIS Center-Applications

King County GIS Center - Client Services

Proxy GIS Agency for smaller K.C. users
of GIS
i.e.: Sheriff, Human Services
Custom cartography for internal and
external clients
Fee for service arrangement

Sample projects:
- Kirkland Parks Atlas
- King County Regional Trails Brochure
- City of Tukwila GIS Needs Assessment

Benefits of GIS to Urban Forestry

- Establish and apply performance metrics and benchmarks for urban forest management
  - establish a monitoring system with verifiable indicators of progress toward achieving urban forestry management objectives
  - Track cost-effectiveness of management practices
  - Compare cost of in-house versus contracted urban forestry services
  - Review urban forestry staff functions, roles and responsibilities toward achievement of management efficiencies

(Source: Cascadia Consulting Group: "A City Among the Trees: A Strategic Plan for Seattle's Urban Forest" - K. Drury, R. Victurine, S. Brace, K. Wolf, A. Wagar)

GIS Applications in King County Parks

- Park Site and Facility Information database - GPS points and all parks facilities (buildings to bollards)

- ParkView: ArcView customization allowing quick park map creation

- Significant Tree database - designed, done for 2 parks; not done system-wide

CityGreen

- ArcView Extension for inventorying trees and canopy

- Input: aerial photos and field surveys

- Calculates estimated environmental and economic benefits of trees

- King County Parks is investigating implementation

Wildlife Habitat Value Analysis - 1993

- Combined Sensitive Areas, Satellite Land Cover Analysis, and Parcel size/ownership info. To assign Wildlife Habitat Values

- Identified parcels were flagged for future development regulations

- Proposed development must include a "wildlife network" - a corridor for wildlife to move through the property

Wildlife Habitat Value Analysis - Methodology

- K.C. Sensitive Areas Ordinance Inventoried Wetlands and Streams with their regulatory buffers

- SPOT 1991 Satellite image of W. K.C., classified for land cover by Loren Siebert, UW Remote Sensing Lab; land covers assigned habitat classes

Wildlife Habitat Value Analysis - Methodology (cont.)

- Parcels - rated by parcel size
- Parcels - dissolved on ownership - rated by contiguous ownership size
- All layers rasterized
- Combined using Arc/Info - GRID
- Raster data matrixed and assigned Wildlife Habitat Value
- Parcels averaged over their total area for final Wildlife Habitat Value

Wildlife Network
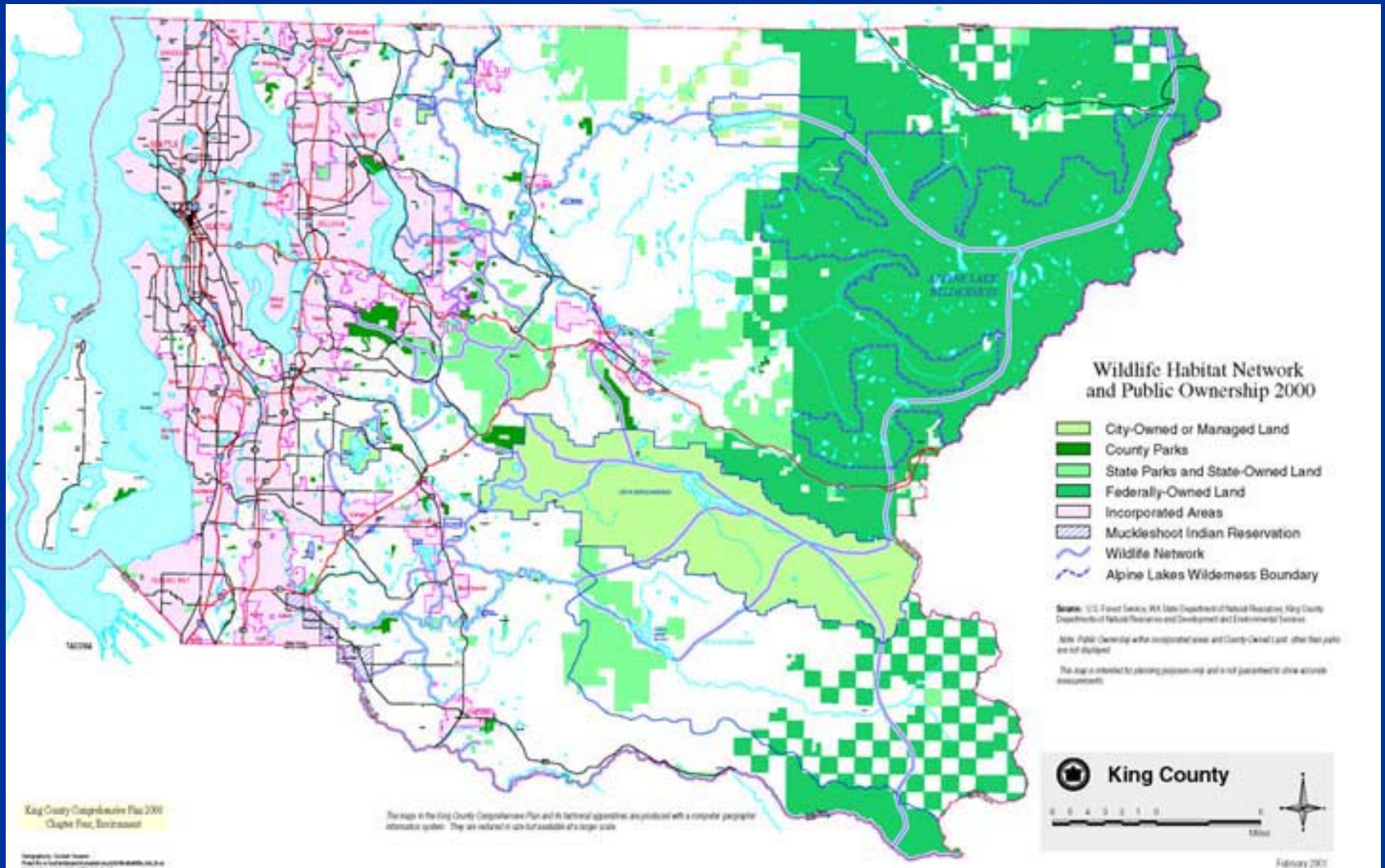
Satellite Image Land Cover Analyses

- 1987 - 1991 Land Cover Change Report
- 1995 Land Cover Classification
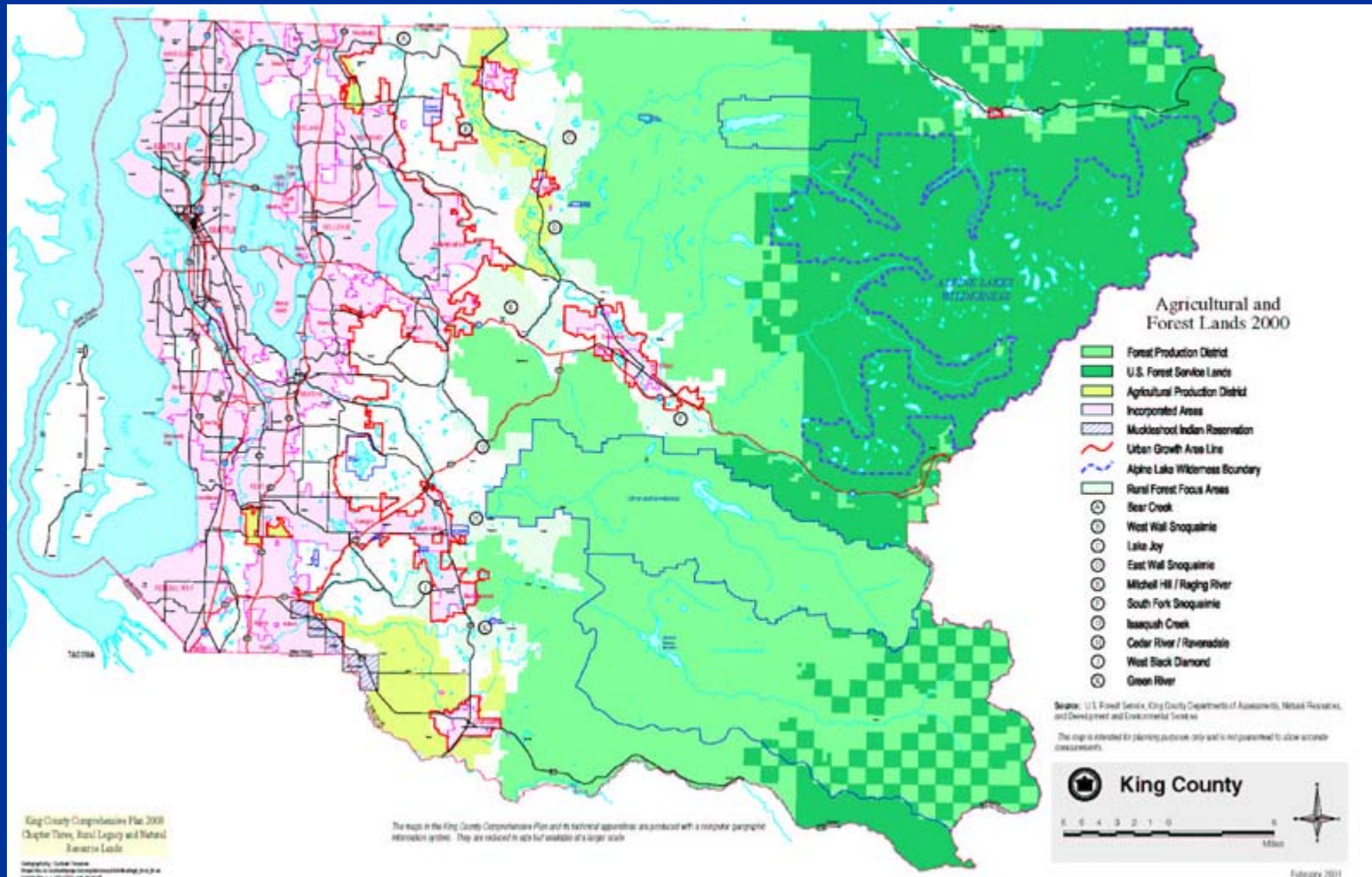- ESA Tri-County Effort

1987 - 1991 Land Cover Change Report

- Performed by Loren Siebert of UW RSAL

- Limited to urban western King Co.

- Identified a 9.46% reduction in forest/shrub and grass/field areas in W. K.C. over a four-year period

1995 Land Cover Classification

- Performed by Chris Pyle, King County Water and Land Resources Division

- Focus on the rural areas of K.C.

- Determined that 68% of rural area of K.C. is forested

- Helped in delineation of Rural Forest Focus Areas

Rural Forest Focus Areas

ESA Land Cover Analysis (2000 -)

- Part of the ESA Tri-County Effort
- Satellite Image acquired in 2000
- Marshall and Associates selected to perform Land Cover classification and analysis
- Focus on impervious surfaces, tree canopy, water bodies, and agricultural lands
- Delivery expected throughout 2002

Forest Stewardship Plans

- Part of the timber land taxation program and the Public Benefit Rating System (PBRS)

- Create easements to preserve current use of land

- Allow property owners to reduce property taxes

Forest Stewardship Plans (cont.)

Peterson et al PBRS App. - E00CT033LF

Forest Stewardship Plans (cont.)

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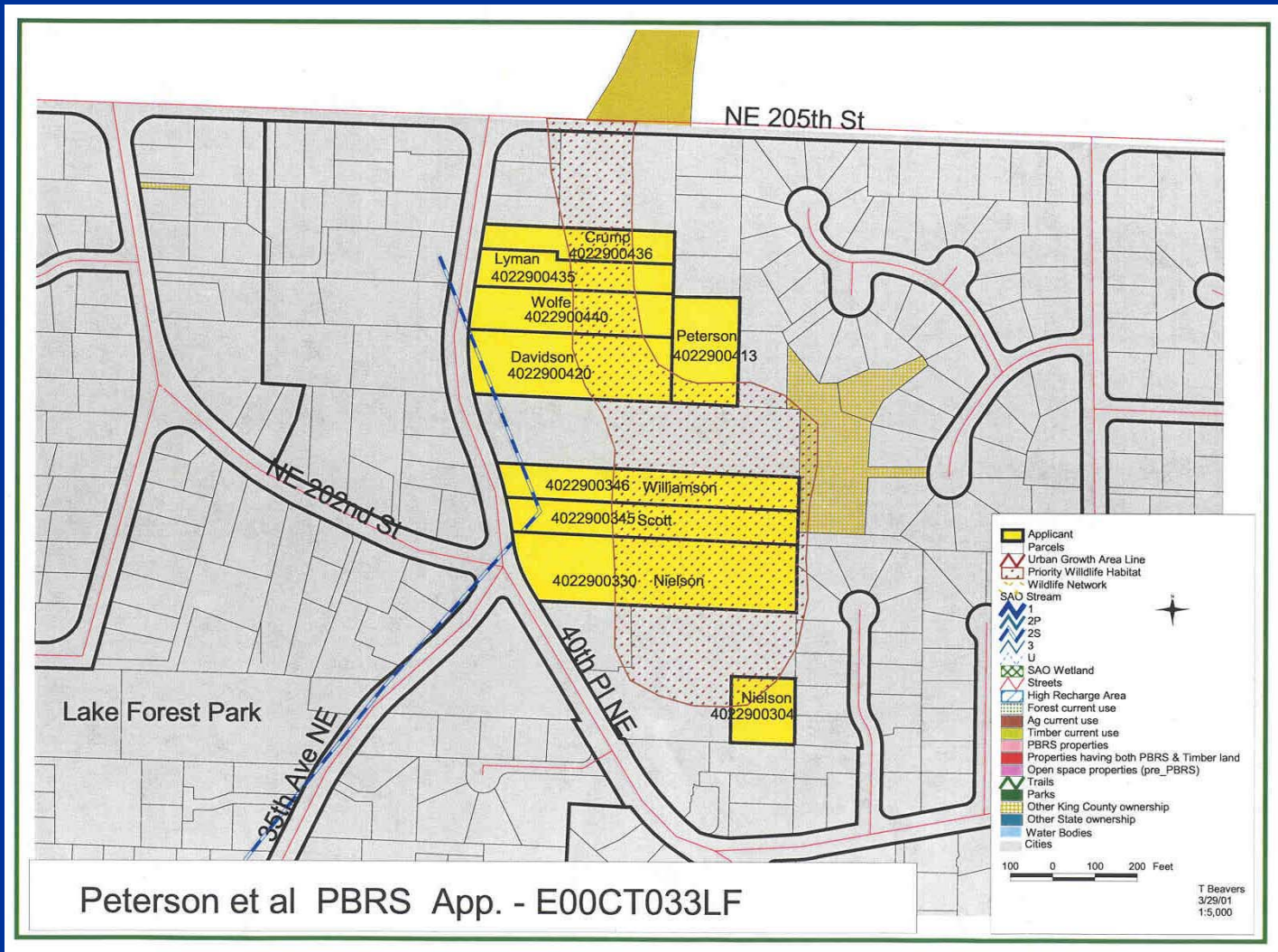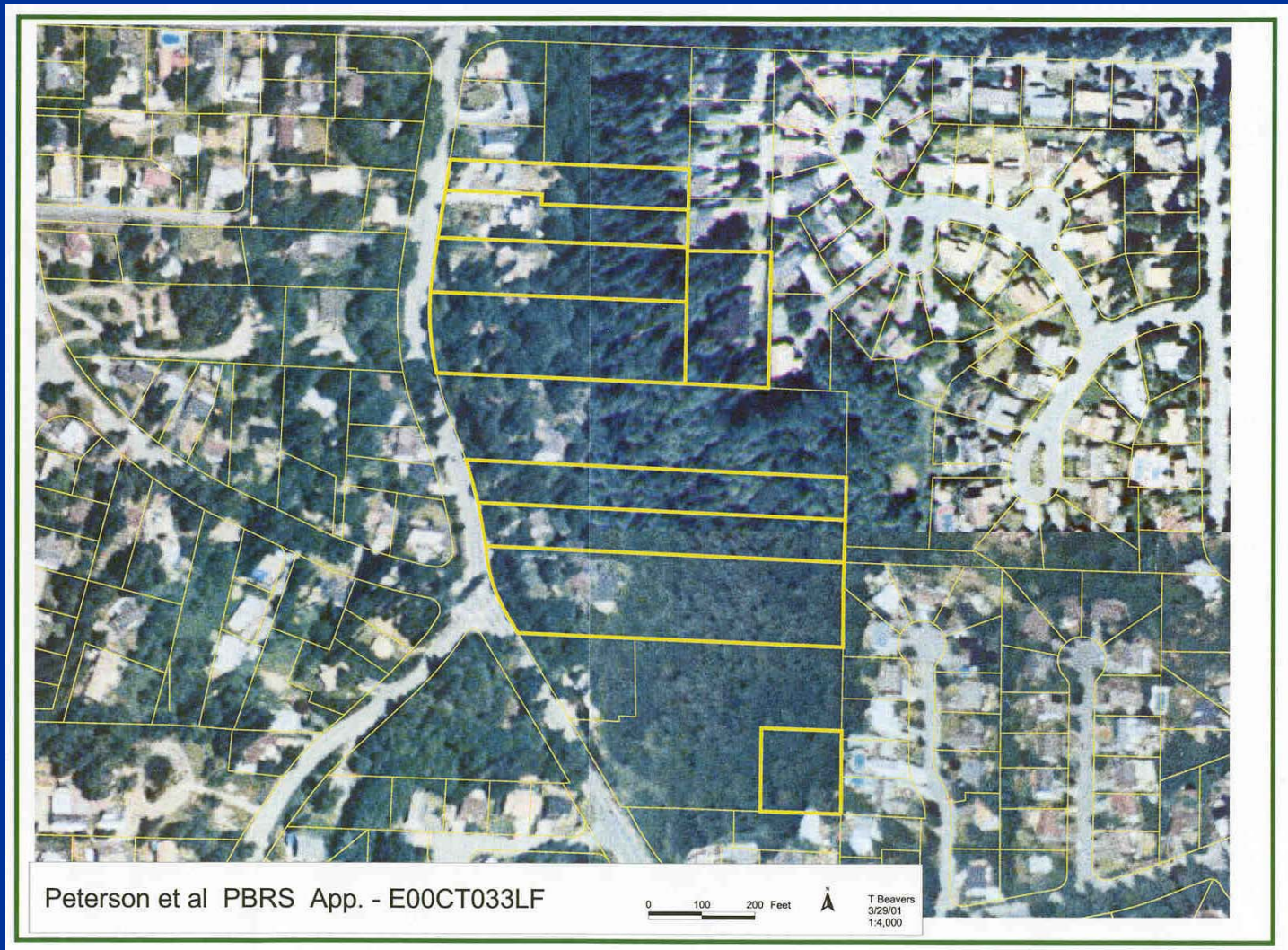
Forest Stewardship Plans (cont.)

- 8 owners of 9 parcels teamed together to get PBRS status

- 10.8 acres total - 6.6 granted PBRS status: for stream buffers, wildlife habitat, scenic resource, open space, and public lands buffers

- Tax savings of $4,500 annually

Contacts

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