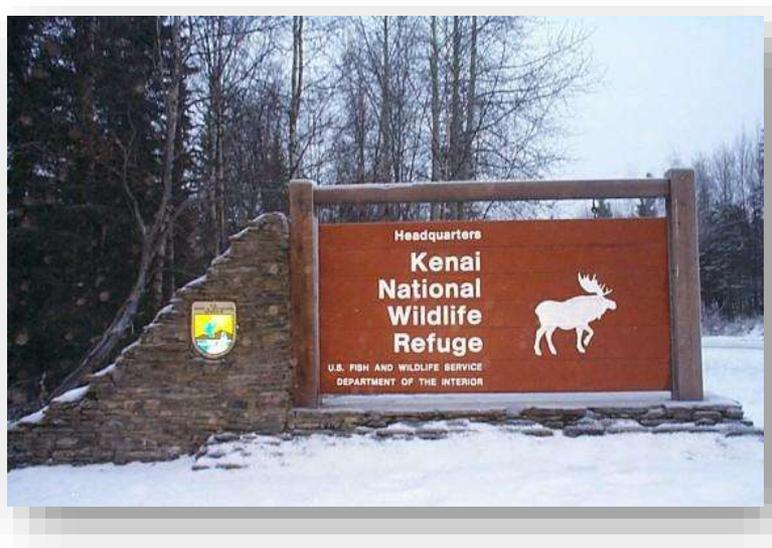
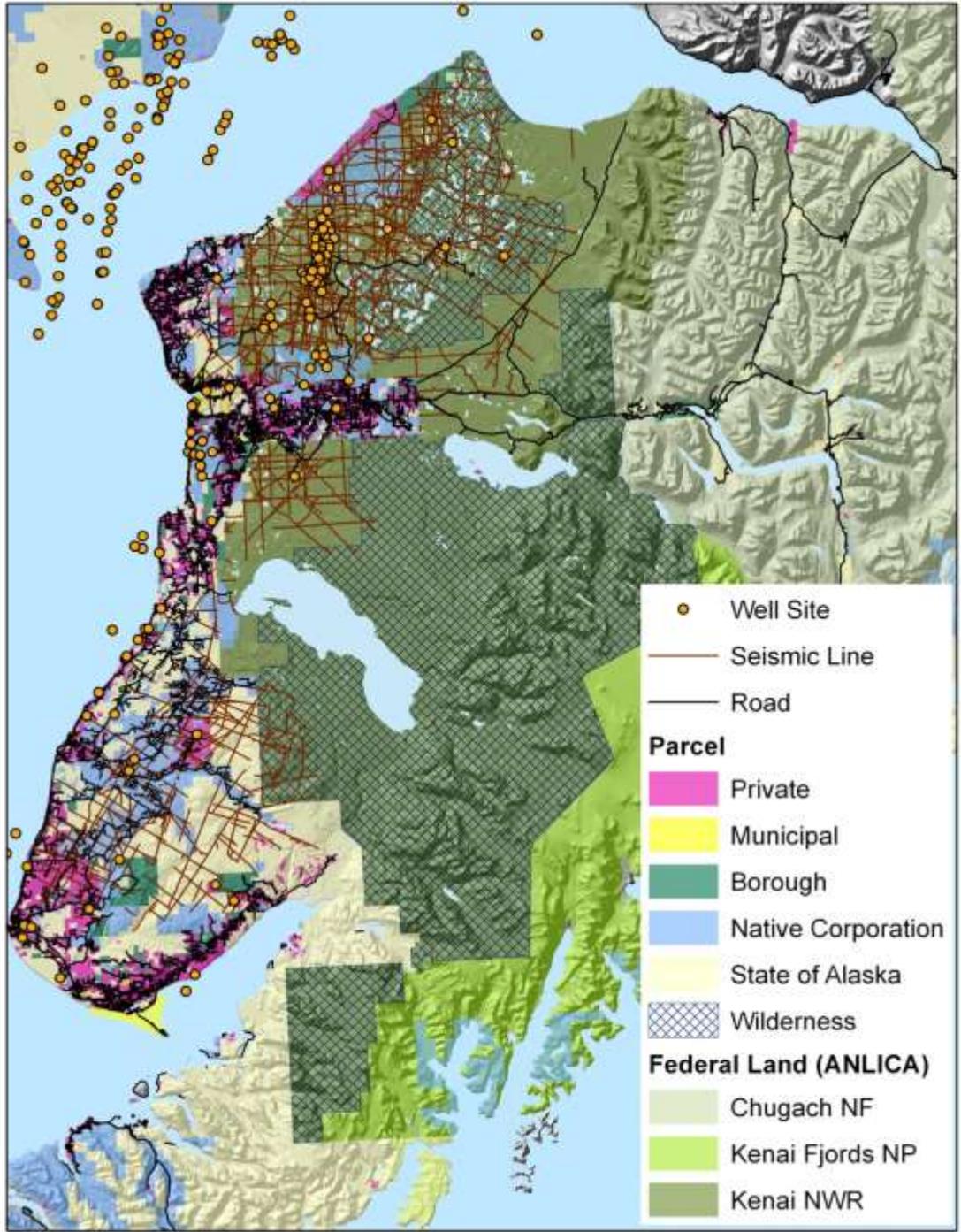


Integrated Pest Management on Kenai National Wildlife Refuge



John Morton
Kenai National Wildlife Refuge

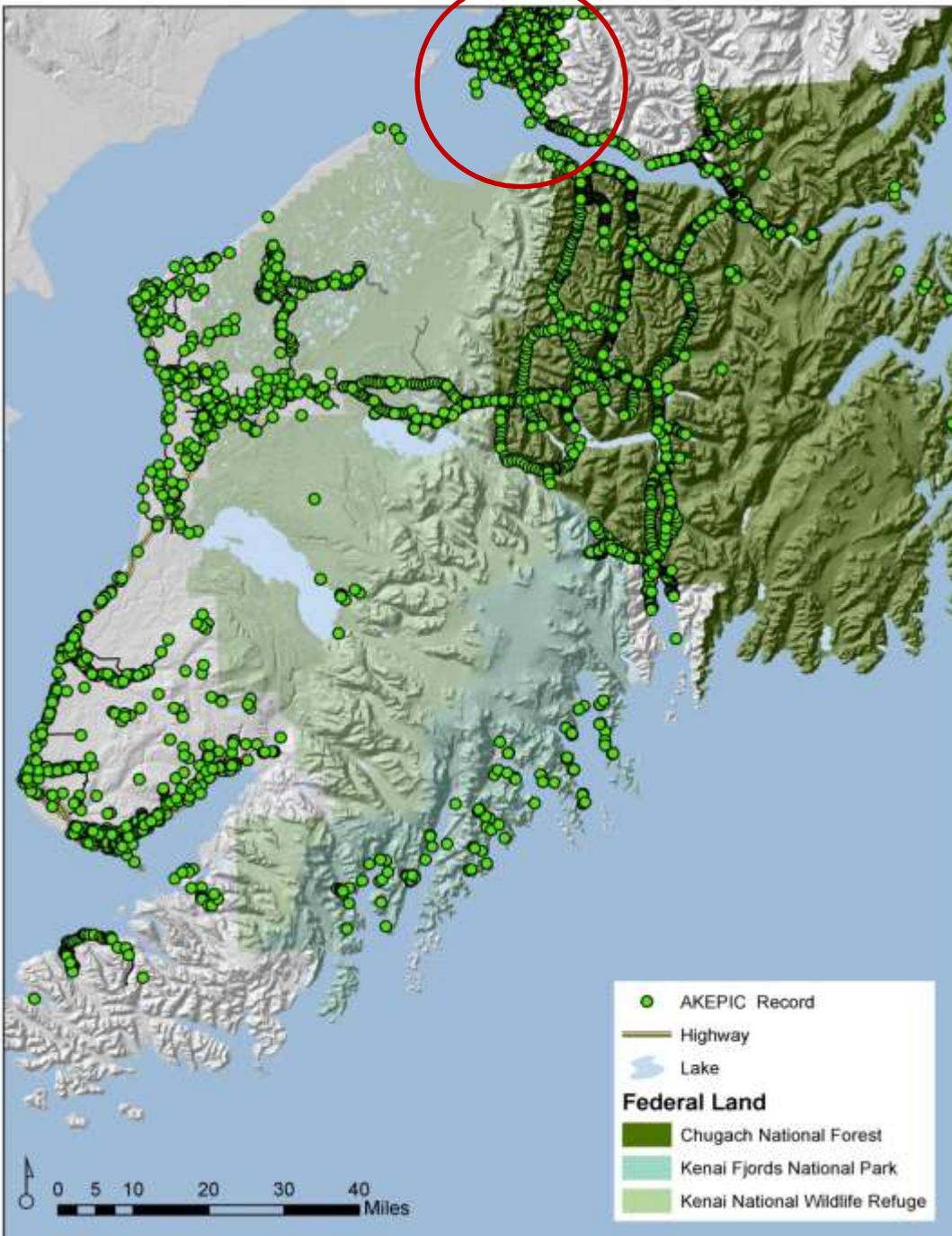




- ✓ **1,800+ miles of seismic lines**
- ✓ **3,016 miles of road, crossing anadromous streams at 381 locales**
- ✓ **1.4 million vehicles per year on the Sterling Highway**
- ✓ **238,800 acres on 55,000 private parcels**
- ✓ **2.2% human population growth**
 = 1,000 new residents/year
 = 1.5 housing units/day
- ✓ **175 miles wildland-urban interface**

Invasive plants on Kenai Peninsula

- ✓ 115 exotic plant species
- ✓ 27,772 records since 2002 mostly associated with roads
- ✓ 50+ new species poised to invade from Anchorage



REFUGE MANDATES

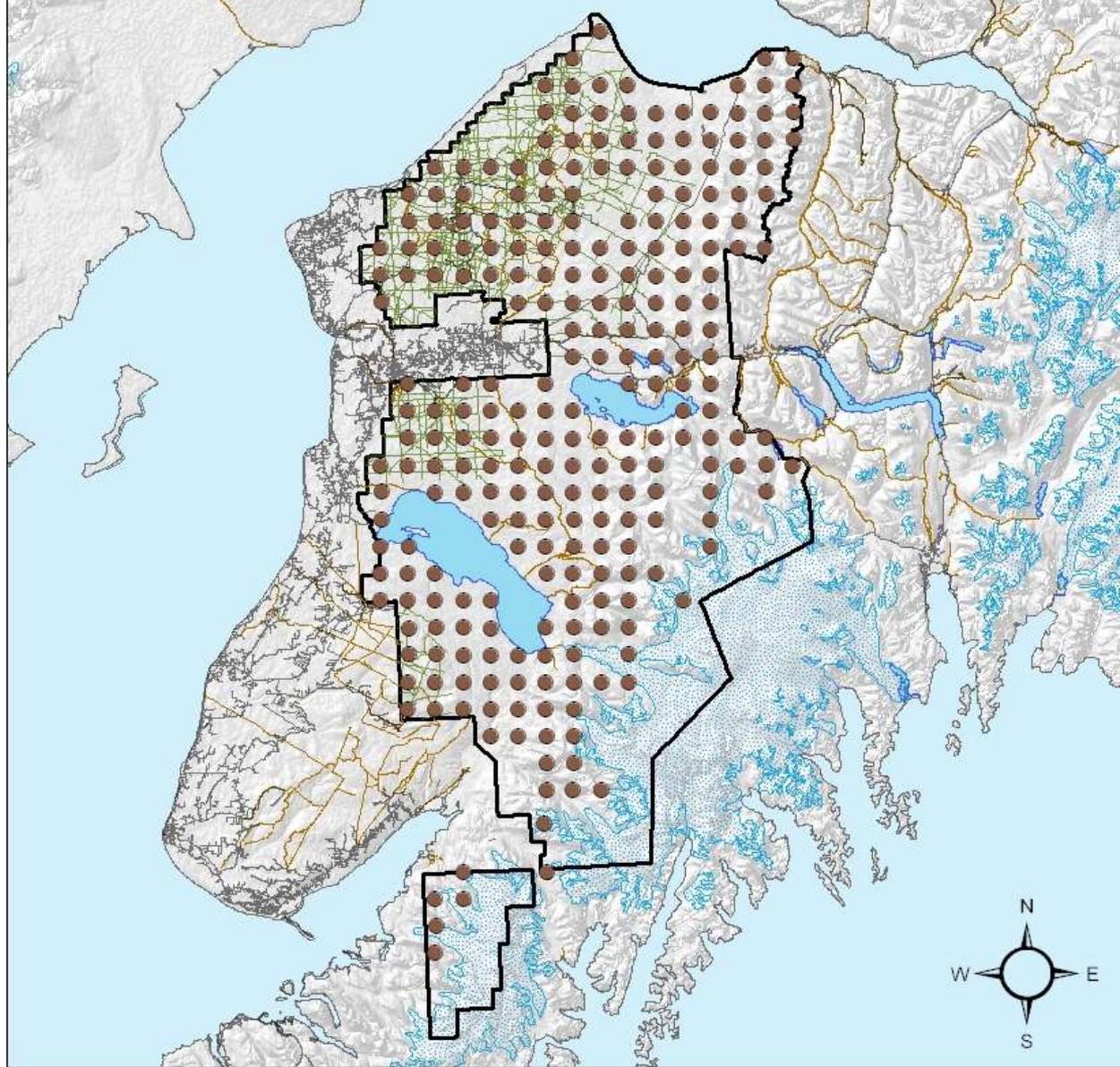


- ✓ ANILCA: conserve fish & wildlife populations and habitats in their *natural diversity*
- ✓ Wilderness Act: leave [it] *unimpaired* for future use and enjoyment as wilderness
- ✓ NWRS Improvement Act: ensure that the *biological integrity, diversity, and environmental health* of the System are maintained

Kenai Refuge is still relatively pristine at the landscape scale (2 million acres)

255 permanent systematically-distributed plots across 2 million acres

<3% contaminated with 3 exotic plant species



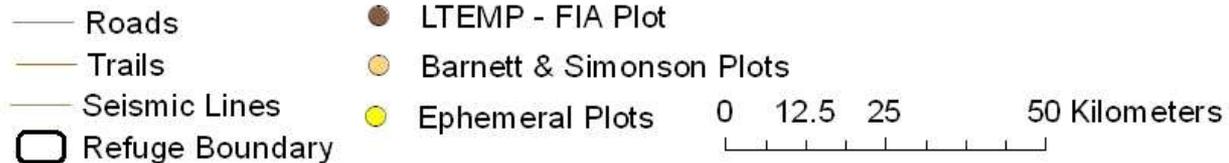
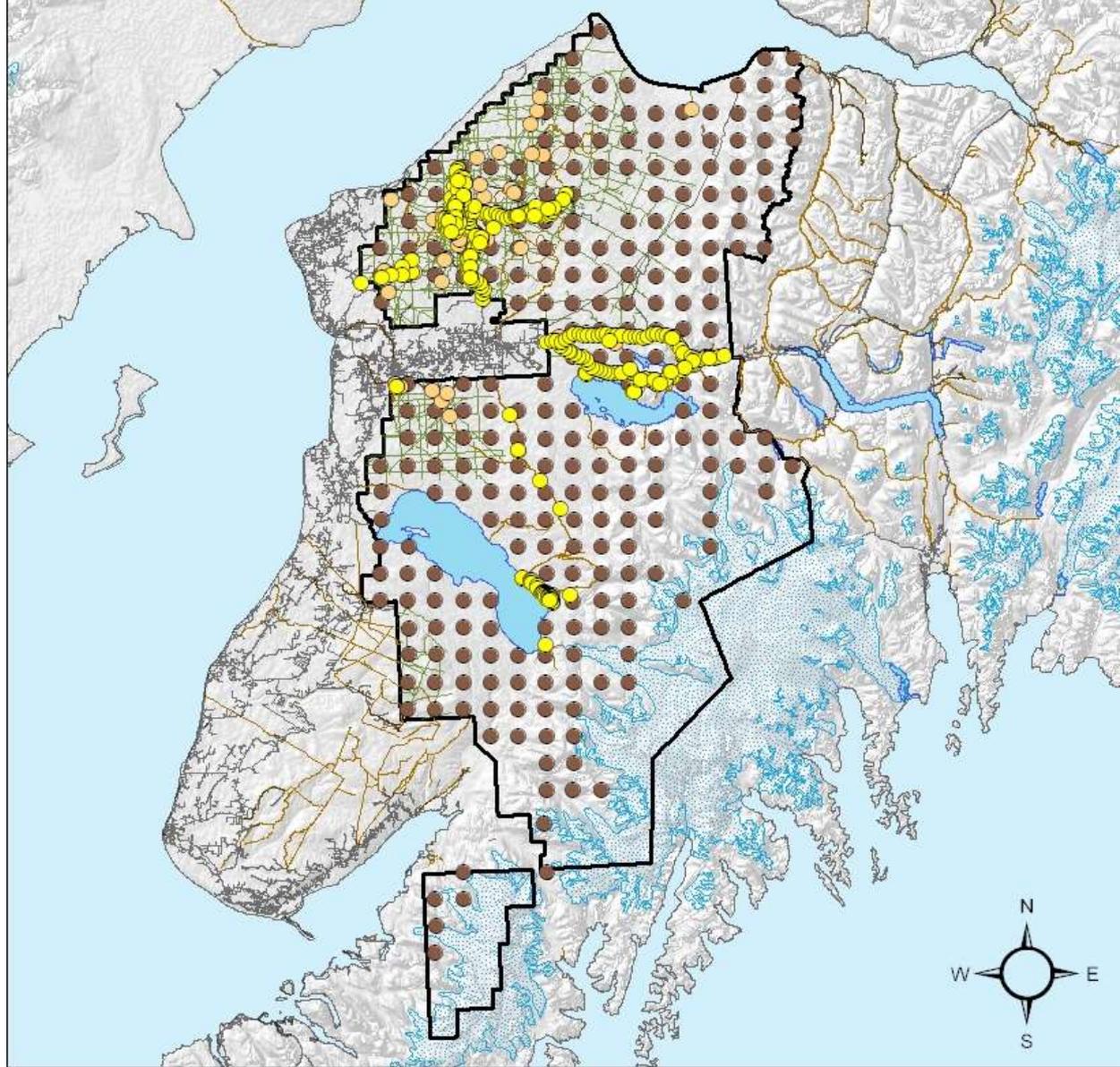
- Roads
- Trails
- Seismic Lines
- Refuge Boundary
- LTEMP - FIA Plot

0 12.5 25 50 Kilometers

**But is infested
wherever the human
footprint occurs
(7,000 acres)**

- ✓ Slemmons 2005
- ✓ BAER 2005,06
- ✓ Hanson Horse Trail 2006
- ✓ Swanson Oil Field 2007 & 09

**~84% infested with
62 exotic plant species**

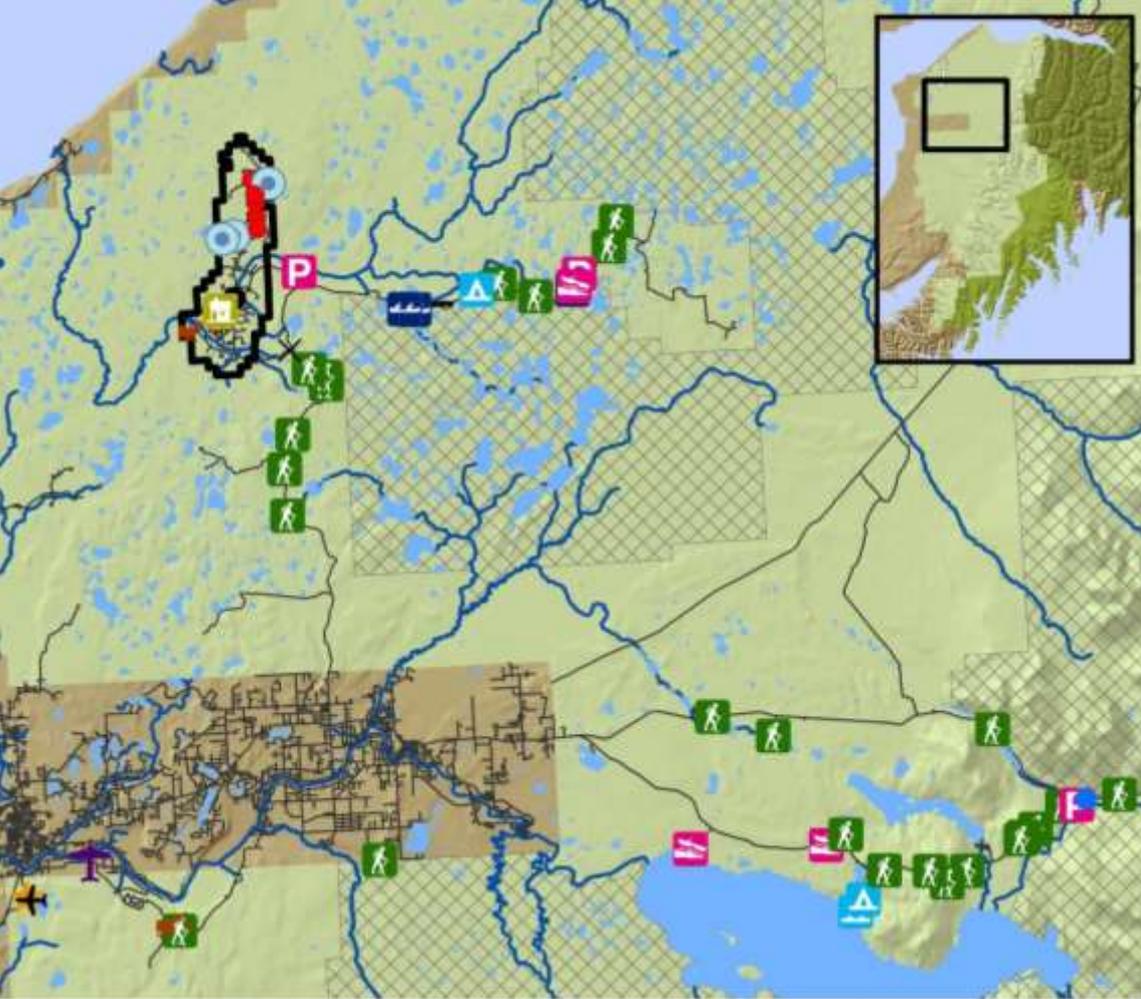


IPM goal is to keep interior of Kenai Refuge weed free

- ✓ Target access points
- ✓ Target species that are peninsula-wide priorities or do not yet occur on the refuge
- ✓ Work with Hilcorp to manage 14,000-acres leased lands
- ✓ Work with AK-DOT to manage highway construction and maintenance
- ✓ Work outside refuge through CWMA
- ✓ Use weed-free certified gravel and other best management practices
- ✓ Research
- ✓ Outreach



Spatially-explicit targets (all species)



- ✓ 29 trail heads
- ✓ 6 boat launches
- ✓ 2 horse trails
- ✓ Soldotna hangar
- ✓ float plane launch
- ✓ Refuge facilities yard

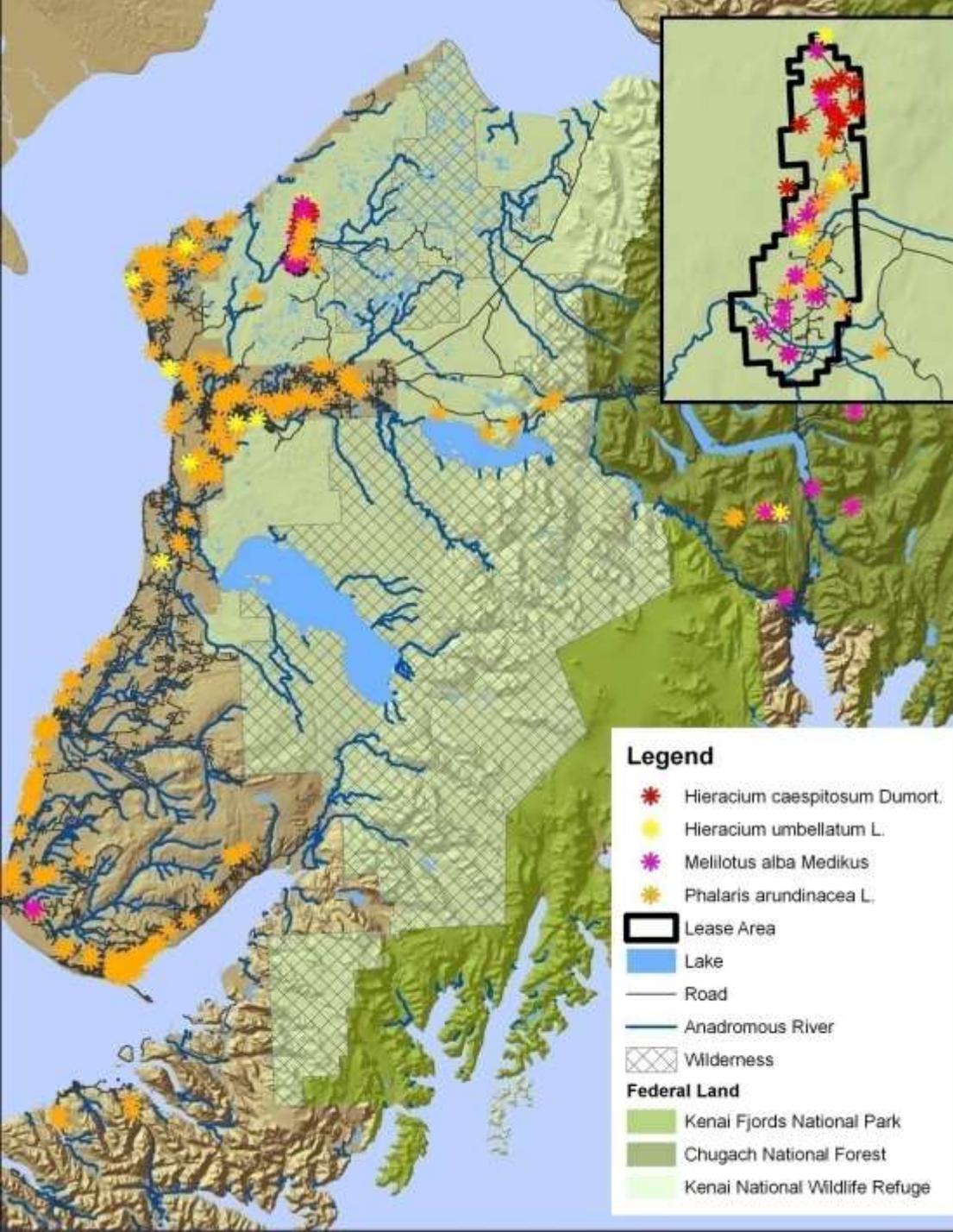
Legend

| | | | | |
|----------------------------|-------------------|---------------------------|---------------------------------|---------------------------|
| Herbicide Treatment | ✈ Floatplane Area | ● Pipeline | ▭ Lease Area | |
| ✈ Airport | ✕ Gate | ● Powerline Access | ■ Lake | |
| 🚤 Boat Launch | ⚒ Gravel Pit | 🚚 Pull Off | — Road | |
| 🏕 Campground | ★ Headquarters | 🚶 Trail Parking | — Anadromous River | |
| 🚣 Canoe Parking | 🏠 Housing | 👤 Visitor Contact Station | ▨ Wilderness | Federal Land |
| ⦿ Conoe Parking | 🅑 Parking | ⊙ Well Pad | ■ Kenai Fjords National Park | ■ Chugach National Forest |
| | | | ■ Kenai National Wildlife Refug | |



Species-specific targets

- ✓ Bird vetch
- ✓ White sweet clover
- ✓ Reed canary grass
- ✓ *Hieracium* spp.
- ✓ Elodea





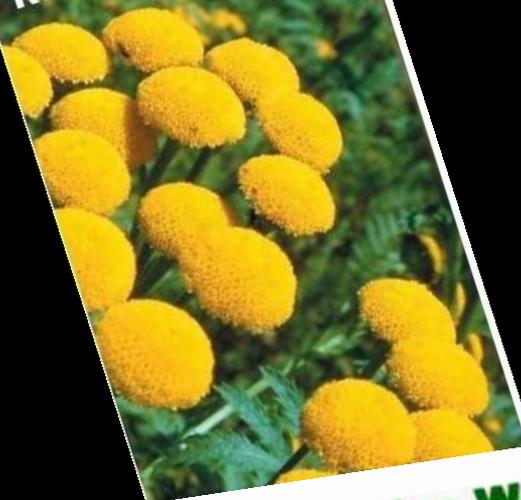






U.S. Fish & Wildlife Service

Invasive Flora of Kenai Peninsula



RESPONSIBLE HOME LANDSCAPING FOR SOUTHCENTRAL ALASKA



DANDELION SUNDAY

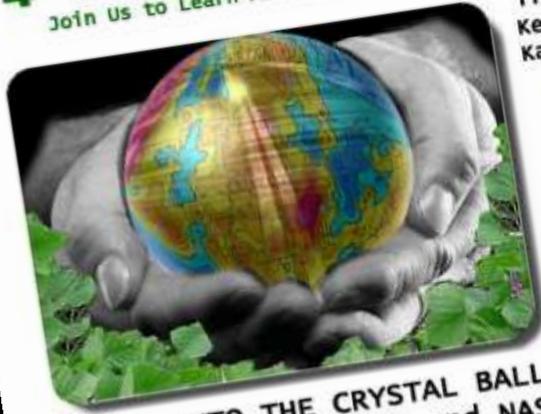
Sunday, June 4
Kenai National Wildlife Refuge
Headquarters in Soldotna 1-4 PM

FREE ICE CREAM SUNDAY

for everyone who brings a full of dandelions

4th Annual Invasive Weed Workshop

Join us to Learn About ALIEN Plants INVADING the Kenai Peninsula
Thursday May 18th, 2006
Kenai Peninsula College - Kachemak Bay Campus in Homer



Gazing INTO THE CRYSTAL BALL:
US Geological Survey and NASA
Predict Biological Invasions

6PM - Presented by: Sara Simonson
National Institute of Invasive Species Science

- 10:30 AM Janice Chumley - Kenai Peninsula-Cooperative Weed Management Area
- Caleb Stemmmons - Homer Soil and Water Conservation District
- 11:30 Glenn Graziano - Alaska Association of Conservation Districts
- 1PM Samuel Terpestra - Kenai Peninsula-Cooperative Weed Management Area
- 1:20 John Morton - Kenai National Wildlife Refuge
- 2:00 Irina Lapina - Alaska Natural Heritage Program
- 2:45 CWMA TAC Meeting
- 4:00 Chris McKee - Chugach National Forest
- 4:15 Carla Stanley - Friends of Alaska Refuges
- 4:30 Break
- 5:00 Tom Johns - UAF Cooperative Extension Service
- 6:00 Keynote speaker - Sara Simonson

SPONSORED BY: Homer SWCD, Alaska Association of Conservation Districts and USFS - State and Private Forestry

October 31, 2012 | 4:16 pm

PENINSULA CLARION

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Aquarium plant threatens Peninsula waterways

Posted: September 22, 2012 - 2:02pm | Updated: September 24, 2012 - 9:28am

By Libby Bella

Kenai National Wildlife Refuge

Interagency biologists working on northern pike control last week in Captain Cook State Recreation Area noticed fragments of a bright green, whorled-leaf aquatic plant washed up on the shore near a boat launch. This unusual plant was identified as a species of Elodea, likely *Elodea canadensis*, the Canadian waterweed. Elodea is known from several locations in Alaska including Fairbanks, Anchorage, and Cordova...and now Stormy Lake on the Kenai Peninsula. This is the first aquatic freshwater

Back | Next

Photo by C. Bella, Kenai National Wildlife Refuge near Zedekia's house. Photo shot in 2012. We don't want to see this when our boats are launched.

Kenai Refuge Special Use / ROW Permit Stipulations

- ✓ ...prevent introduction of invasive species and any treatments required
- ✓ ...implement site-specific pre-construction monitoring and mitigation plan for invasives
- ✓ ...use gravel source certified as weed-free
- ✓ ...power/high-pressure wash or steam-clean all potential seed transport surfaces (wheeled/tracked equipment, helicopter skids and boots of work crews)



Certified Weed-Free Program

- ✓ Certified weed-free **forage** for pack livestock on refuge
- ✓ Certified weed-free **gravel** (580,000 cubic yards!) on the MP 58-79 Sterling Highway project that bisects refuge
- ✓ Certified weed-free **soil** for bank restoration, pad remediation and other projects on refuge



Early Detection Rapid Response



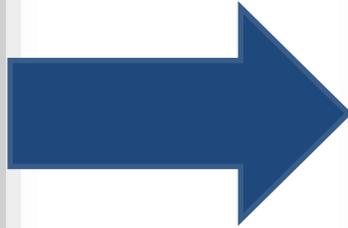
Sports Lake (May 2017)

Sports Lake (Feb 2017)

Exotic plants eradicated from Kenai Refuge

| | |
|-------------------------------------|------------------------|
| Achillea ptarmica | sneezeweed |
| Asperugo procumbens | German madwort |
| Betula pendula var. dalecarlica | European white birch |
| Cytisus scoparius | Scotch broom |
| Elodea spp. | Hybrid waterweed |
| Melilotus officinalis | (yellow) sweetclover |
| Polygonum convolvulus | black bindweed |
| Senecio integerrimus var. exaltatus | Columbia ragwort |
| Sonchus arvensis | field sowthistle |
| Sorbaria sorbifolia | false spirea |
| Tanacetum vulgare | common tansy |
| Typha latifolia | broadleaf cattail |
| Viburnum opulus var. americanum | American cranberrybush |





Questions??