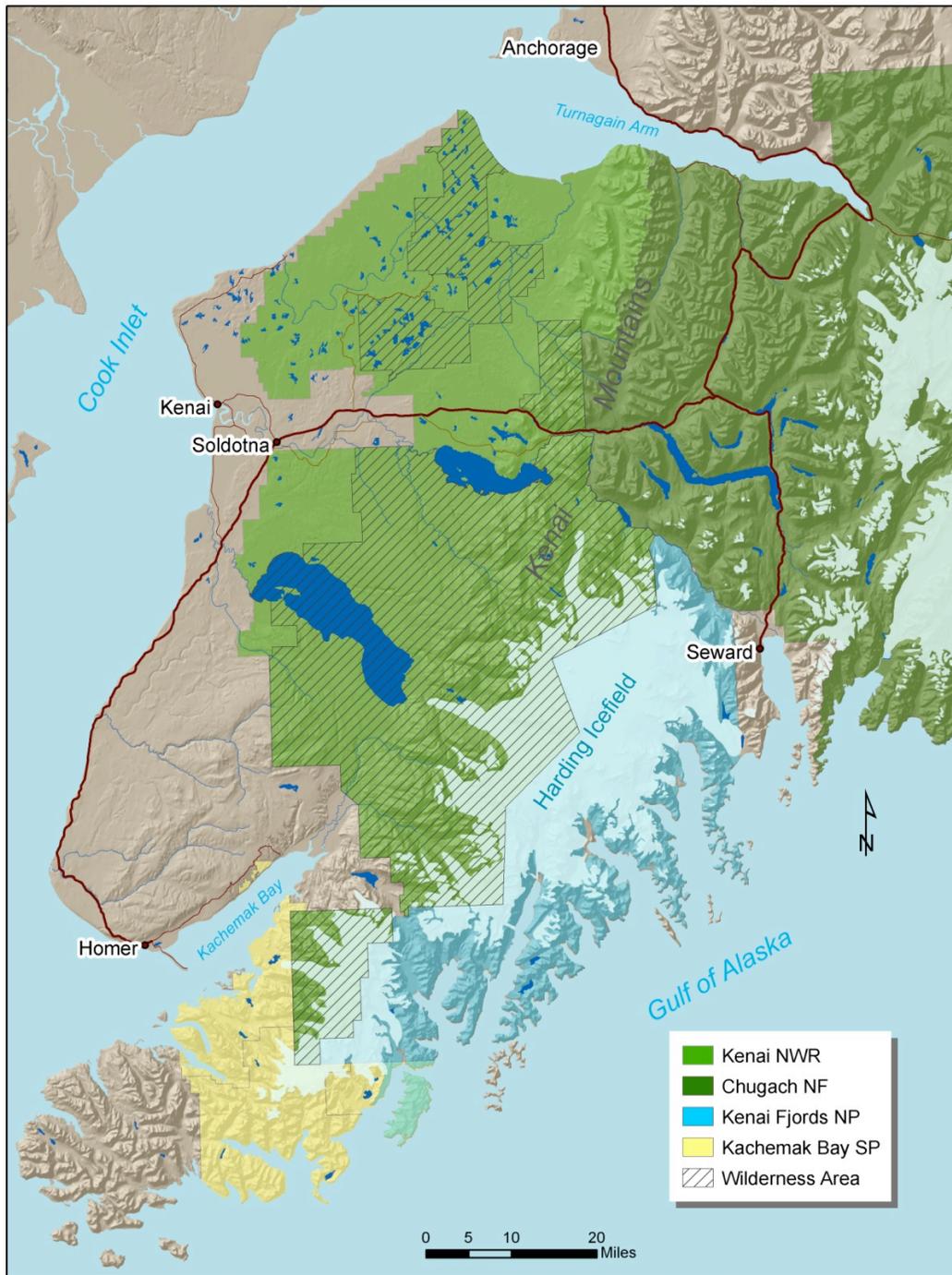


Invasive Plant Management on Kenai National Wildlife Refuge



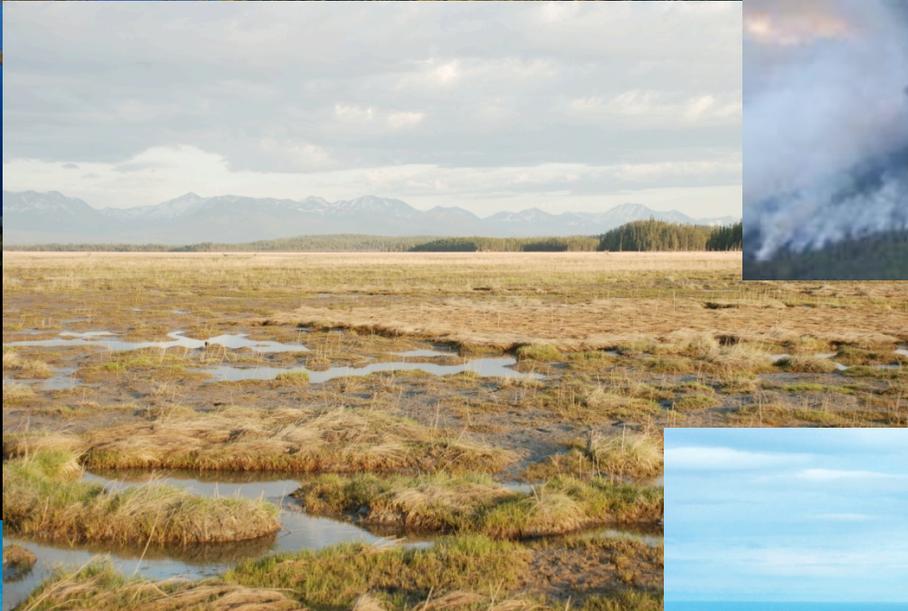
**John Morton, Toby Burke, Todd Eskelin & Dawn Magness
Kenai National Wildlife Refuge**





REFUGE MANDATES

- conserve fish & wildlife populations and habitats in their *natural diversity*
- ensure *water quality and necessary water quantity*
- leave [it] *unimpaired* for future use and enjoyment as wilderness
- ensure that the *biological integrity, diversity, and environmental health* of the System are maintained

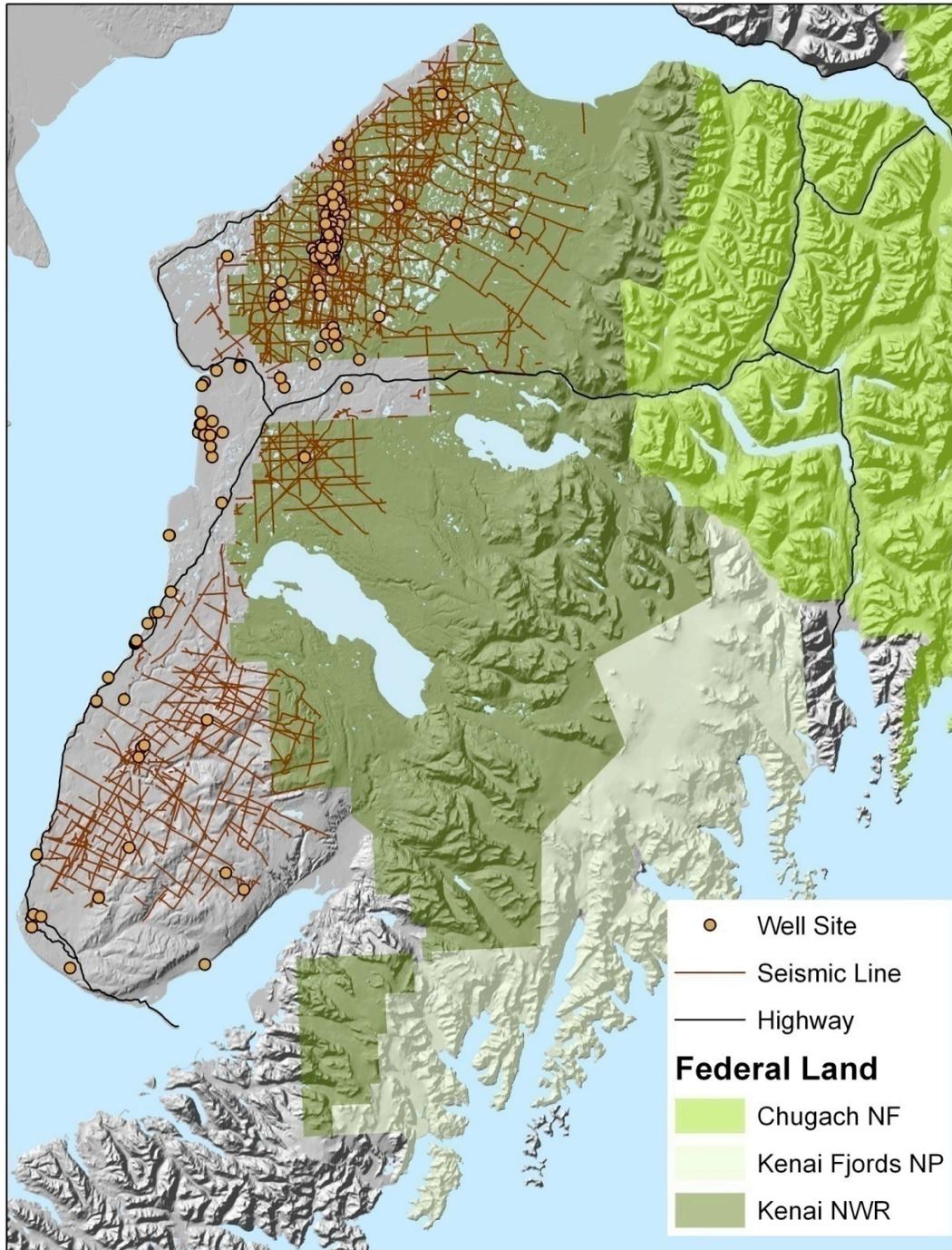


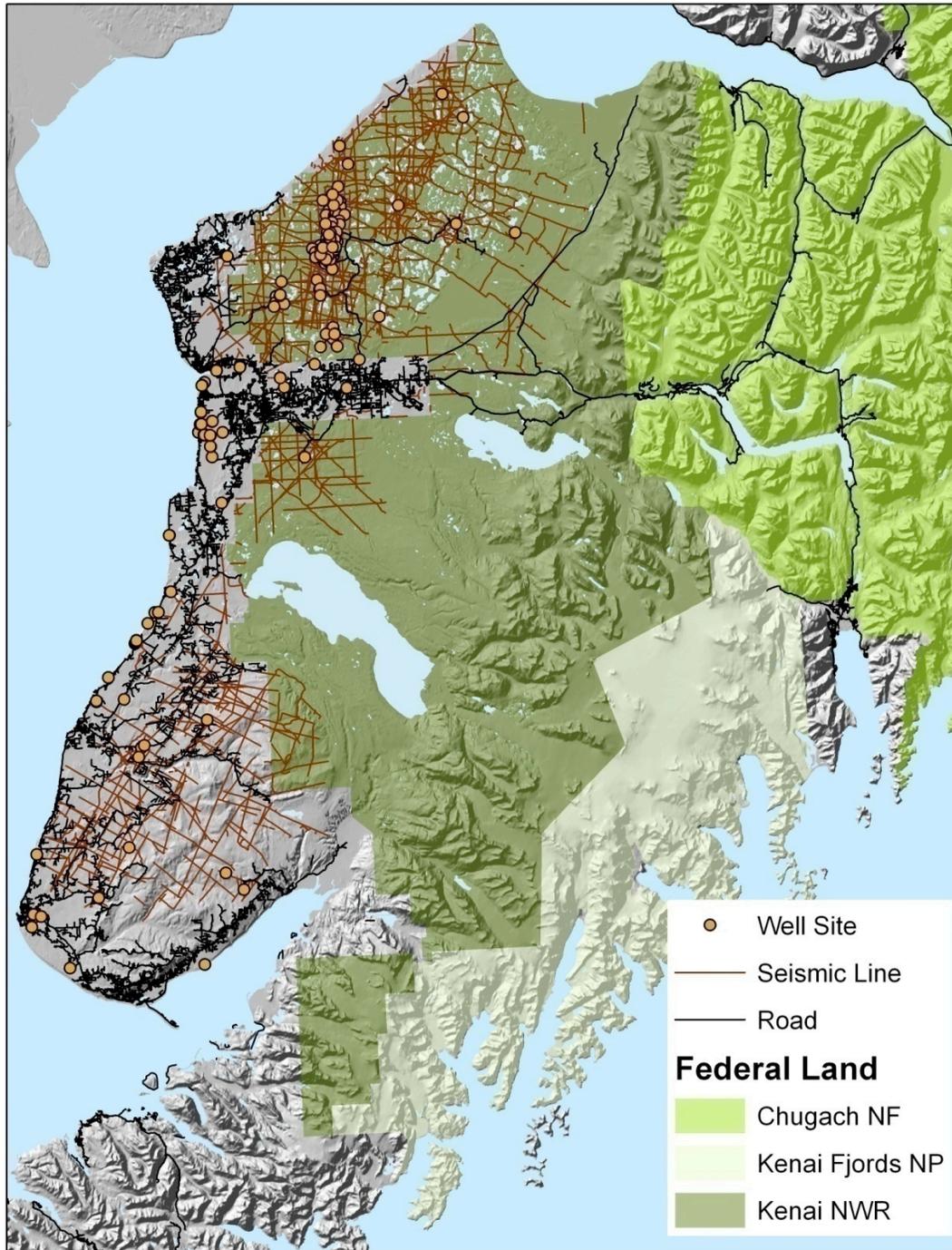
3230B

6/14/2004 9:36am

Commercial oil and gas extraction

- ✓ 13,252 acres of active leases
- ✓ 104 oil & gas pads, 188 wells
- ✓ >90 buildings
- ✓ 71 miles of pipelines
- ✓ 94 miles of roads
- ✓ >1,800 miles of seismic lines

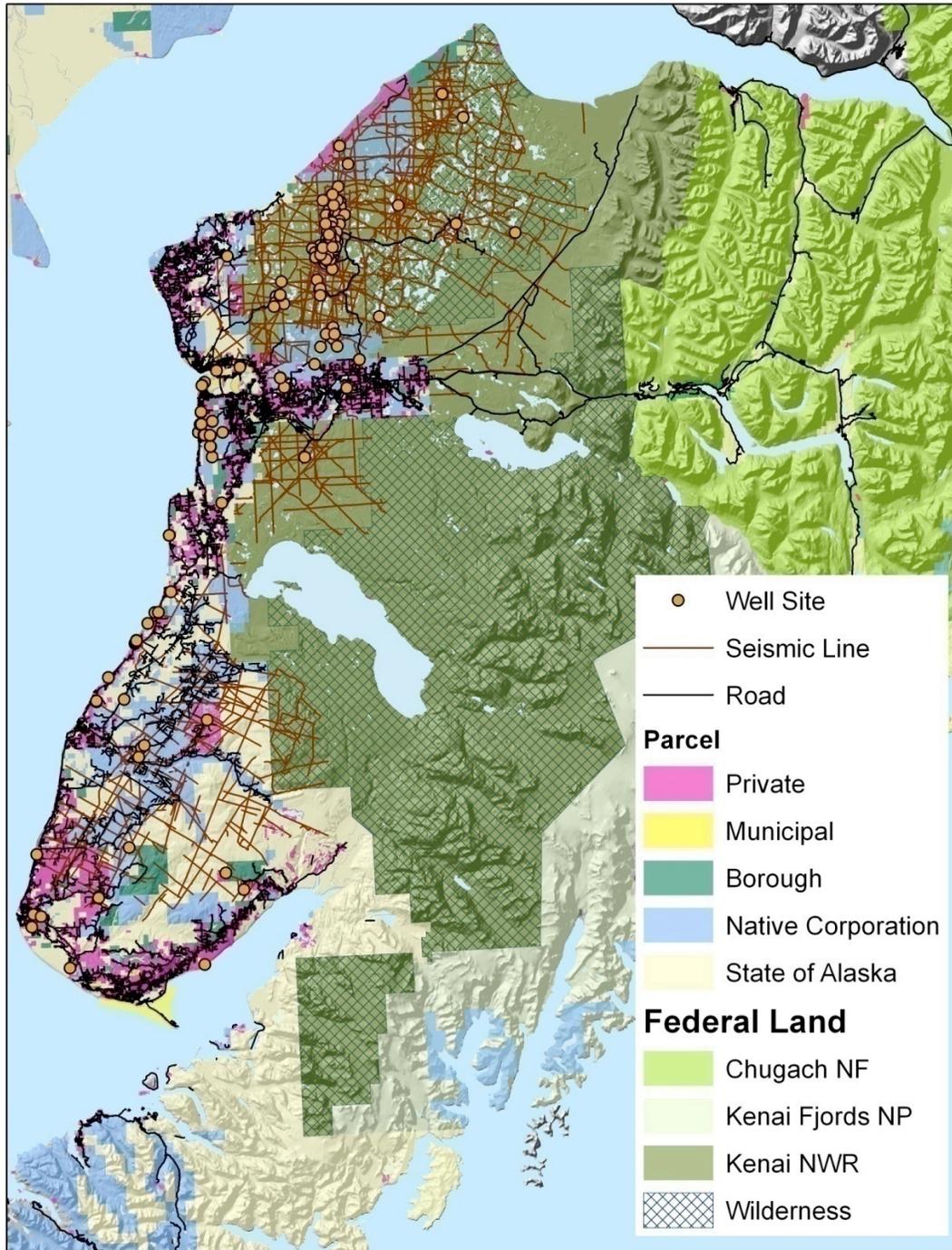




Roads

- ✓ 3,016 miles of road, crossing anadromous streams at 381 locales
- ✓ >1 million vehicles on 22 miles of Sterling Highway that bisects KENWR
 - = 2 vehicles/minute/day
 - = 250 moose-vehicle collisions/yr





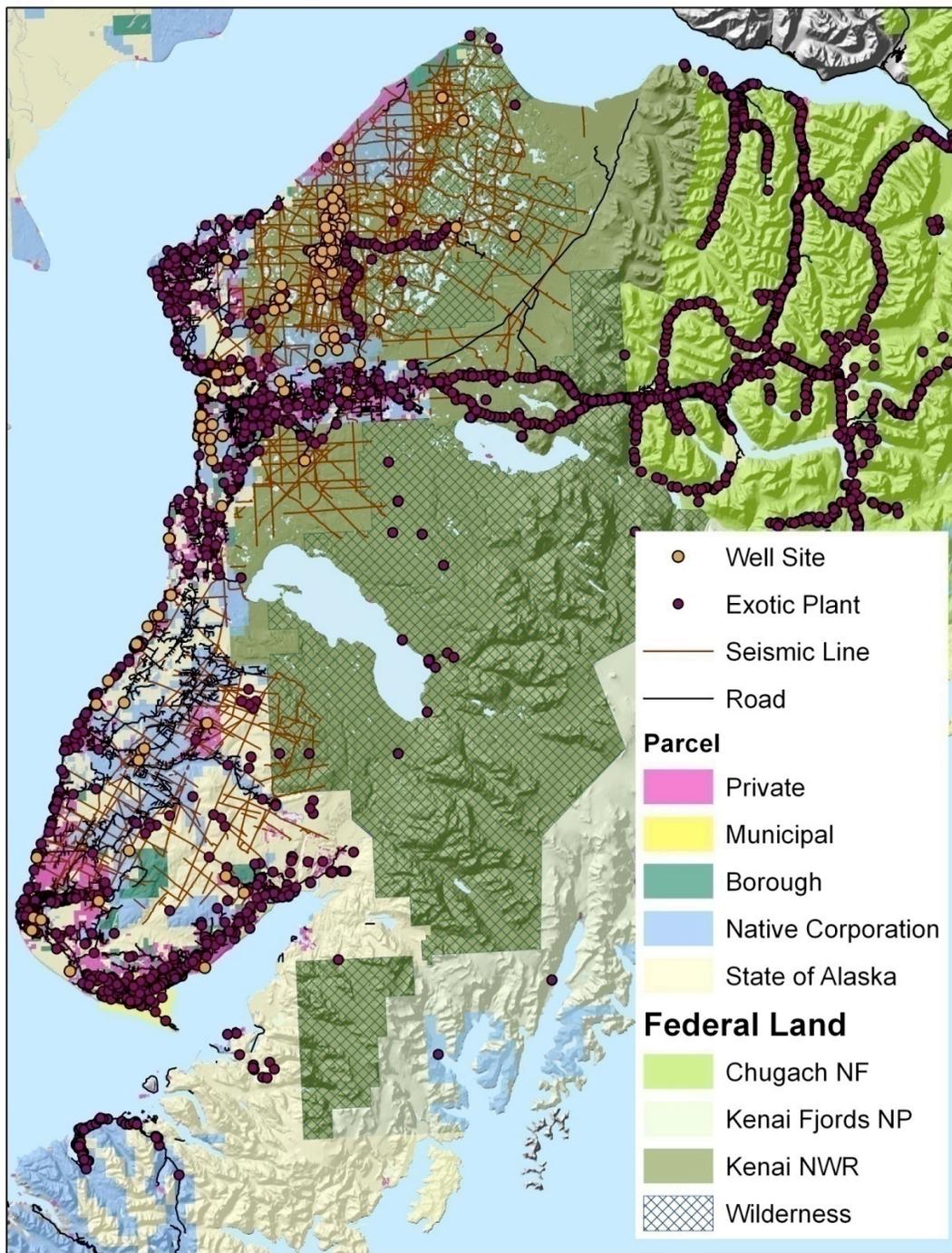
Rapid parcelization of non-Federal lands

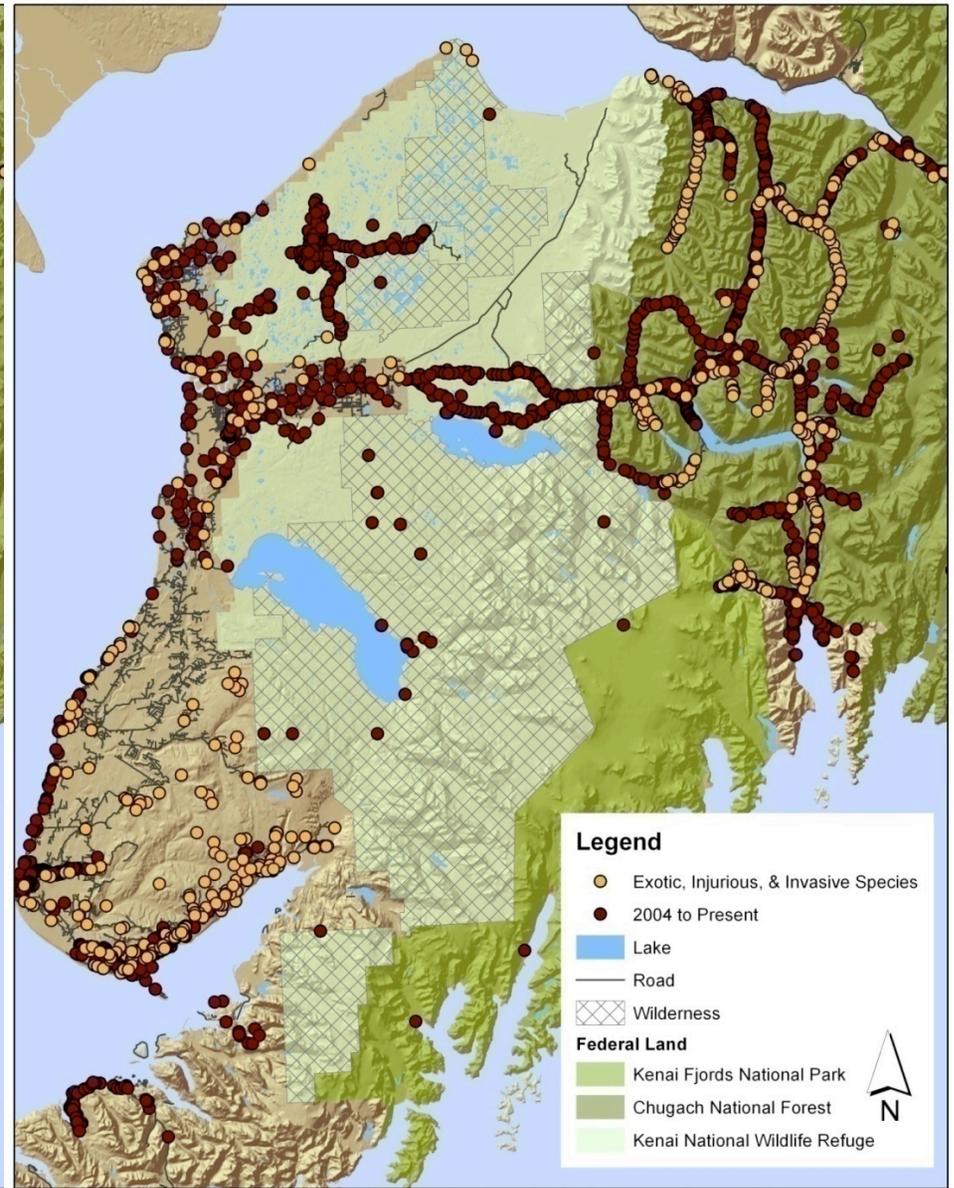
- ✓ ~53,000 people in Kenai Peninsula Borough
- ✓ 238,800 acres of private lands divided into 55,000 parcels
- ✓ 2.2% human population growth
= 1,000 new residents/year
= 1.5 housing units/day
- ✓ 37 miles of Wilderness along 175 miles wildland-urban interface



Rapid spread of exotic & invasive plants

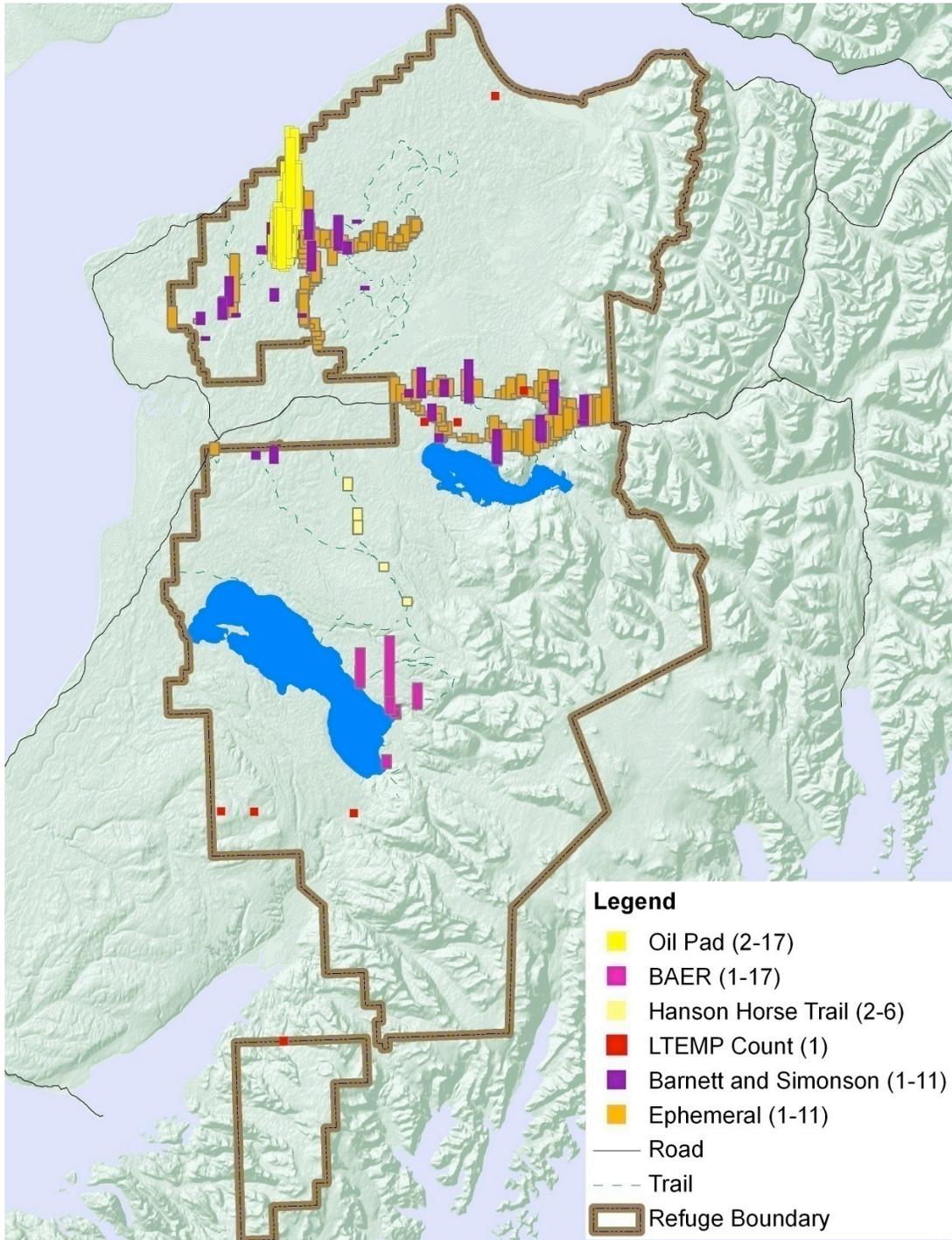
- ✓ 110 species on Kenai Peninsula!
- ✓ 71 species on KENWR
- ✓ Reed canary grass, hawkweeds, white sweet clover





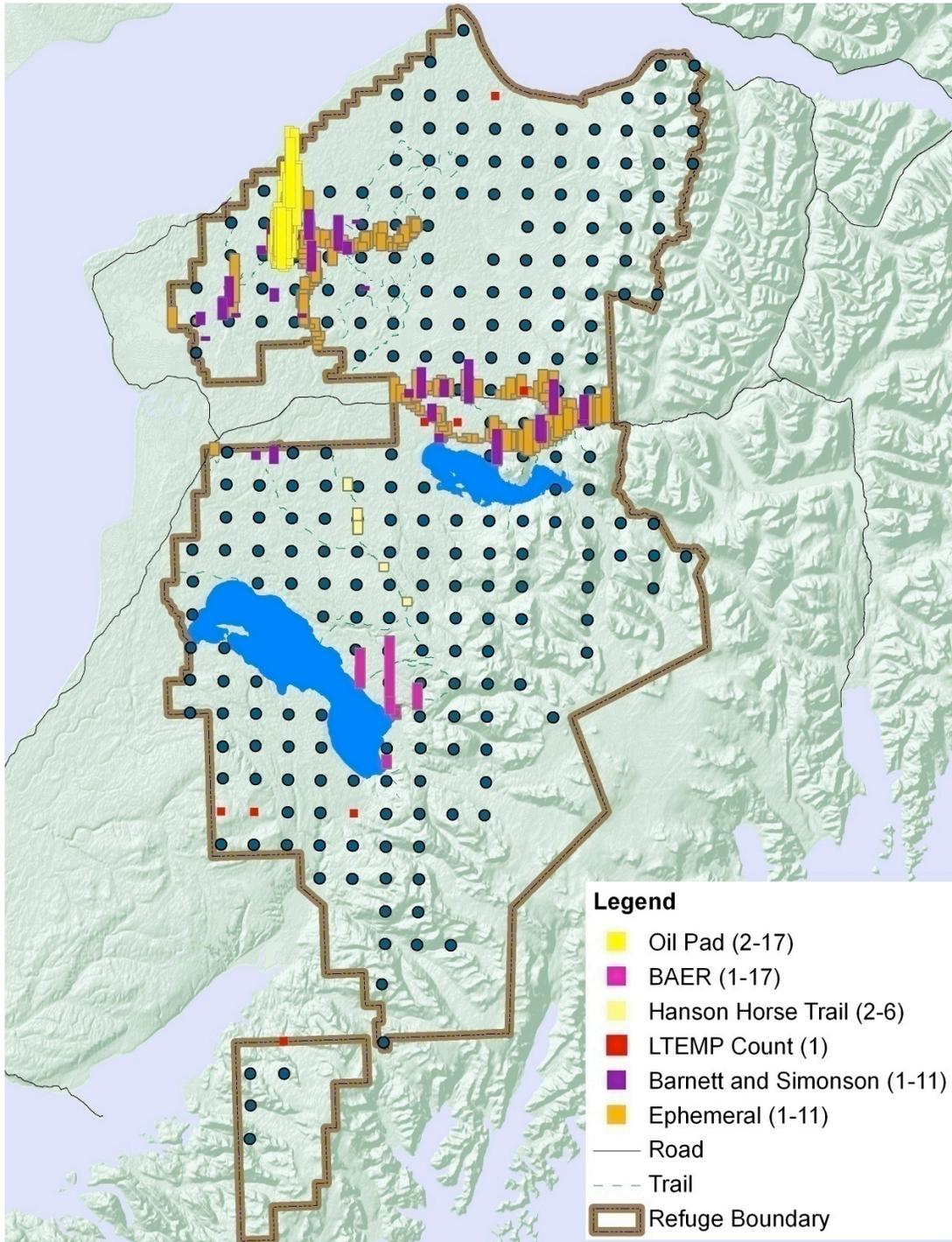
2004 (60 species)

2010 (110 species)



Where exotics occur on KENWR

LTEMP 2004 & 06
 Slemmons 2005
 Glacier Ck Fire 2005 & 06
 Hanson Horse Trail 2006
 Barnett & Simonson 200
 Swanson Oil Field 2007 & 09



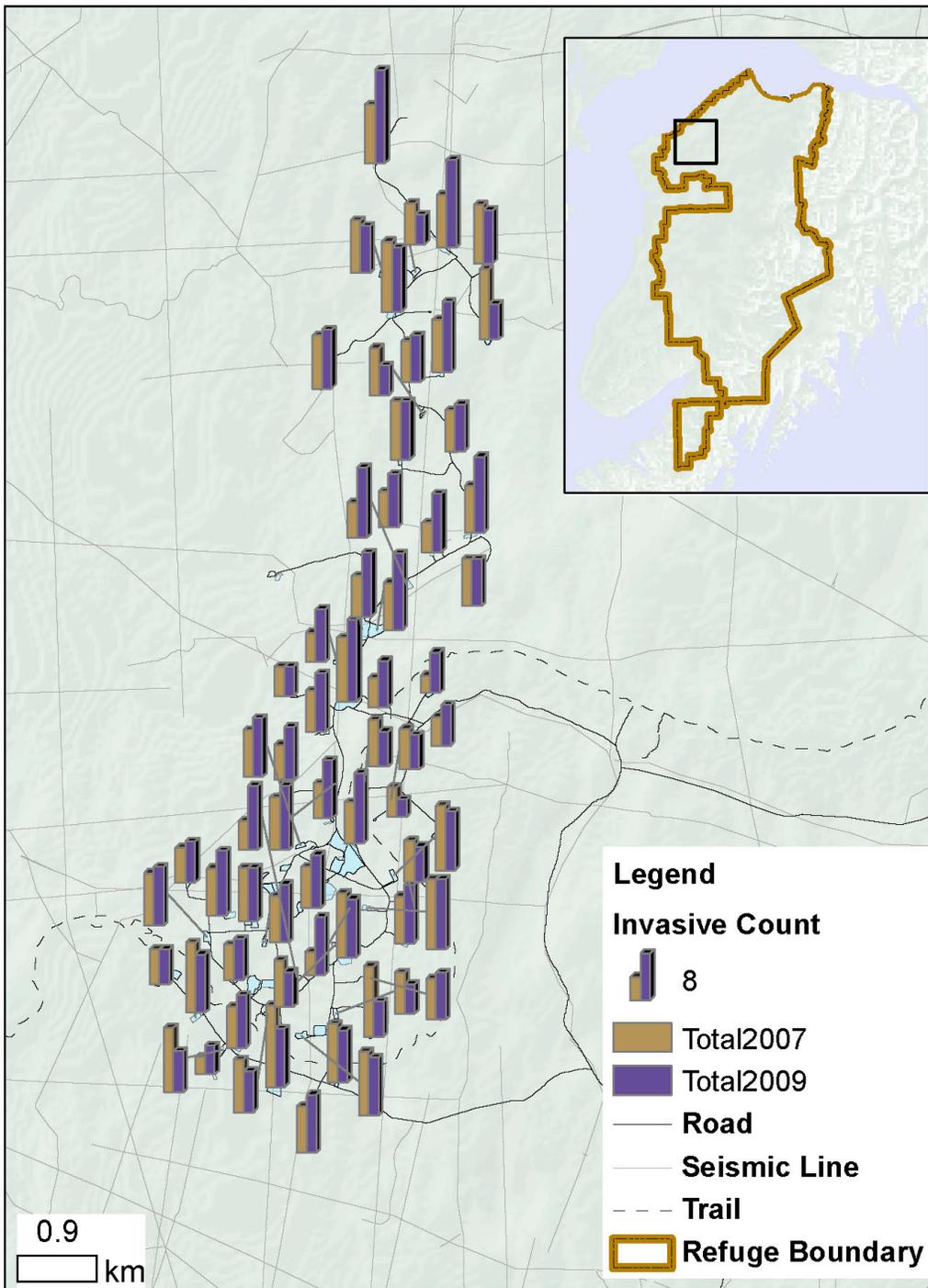
Where exotics do **NOT** occur

LTEMP 2004 & 06
 Slemmons 2005
 Hanson Horse Trail 2006
 Barnett & Simonson 2007
 Swanson Oil Field 2007 & 09

2007 & 2009

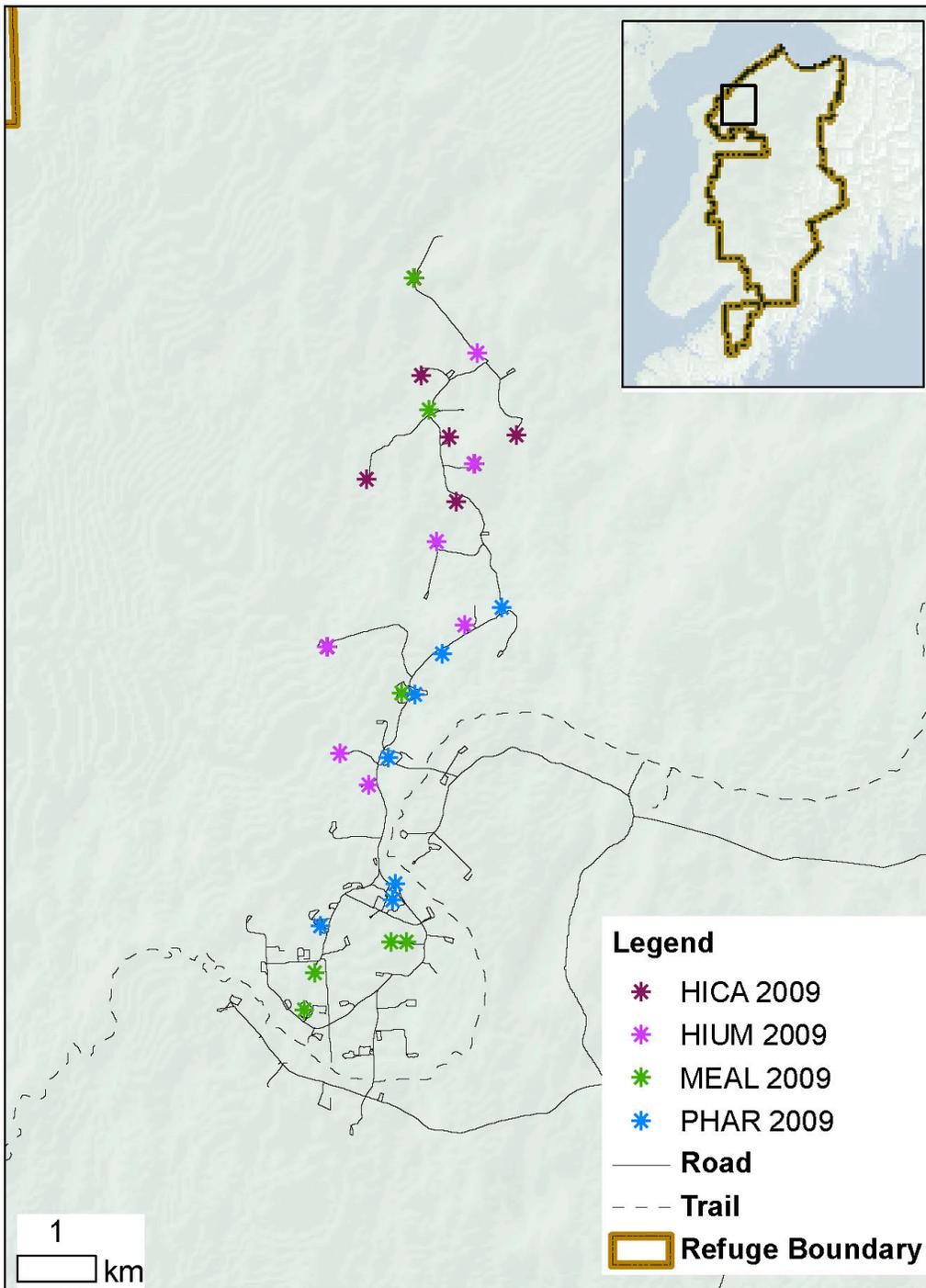
Swanson Oil & Gas Field

8,000 acres leased
60+ well pads
43 miles of roads
62 acres of buildings
large compressor plant
12 acres of gravel & sand pits



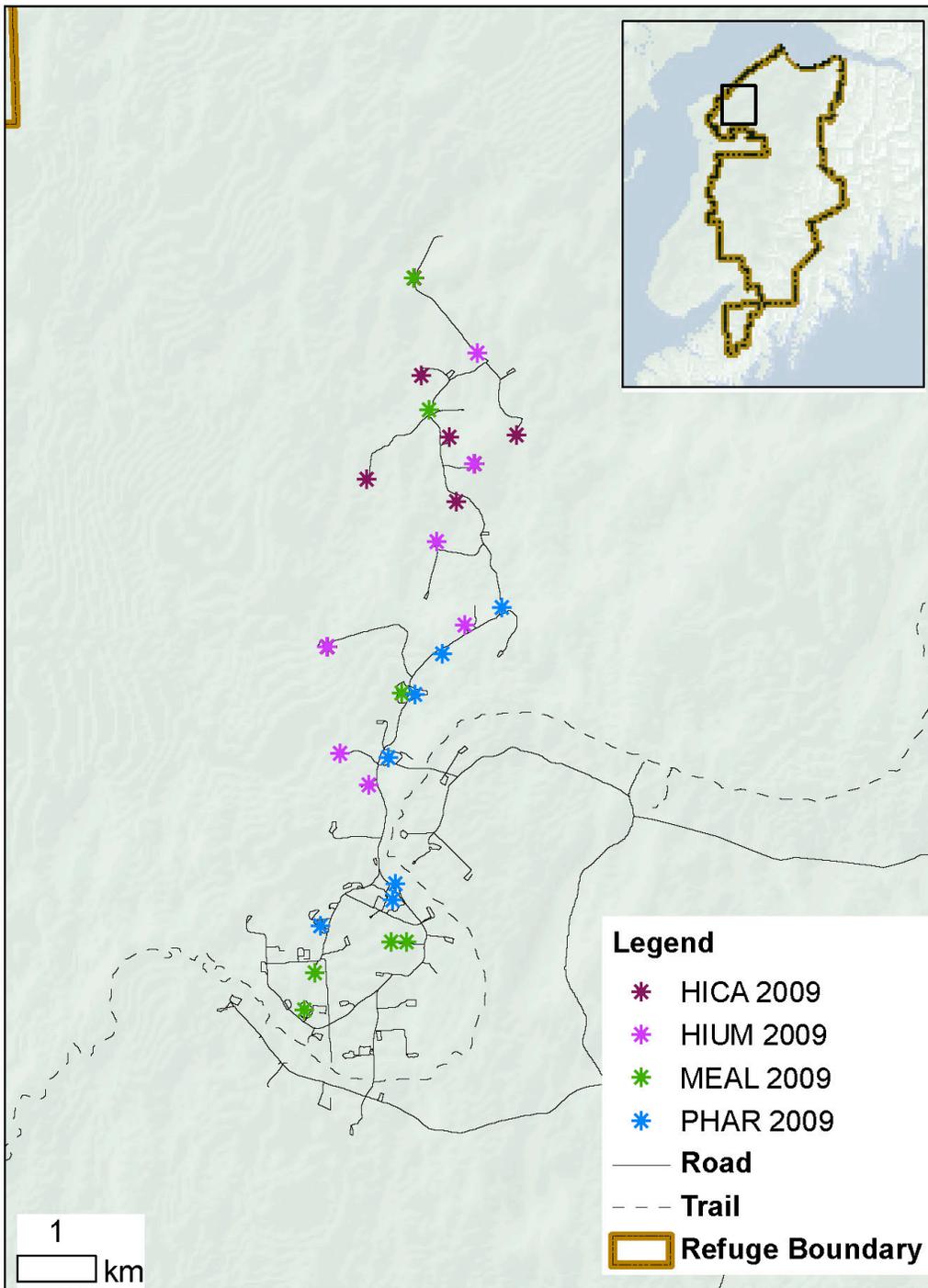
Invasive species of concern in Swanson Oil Field

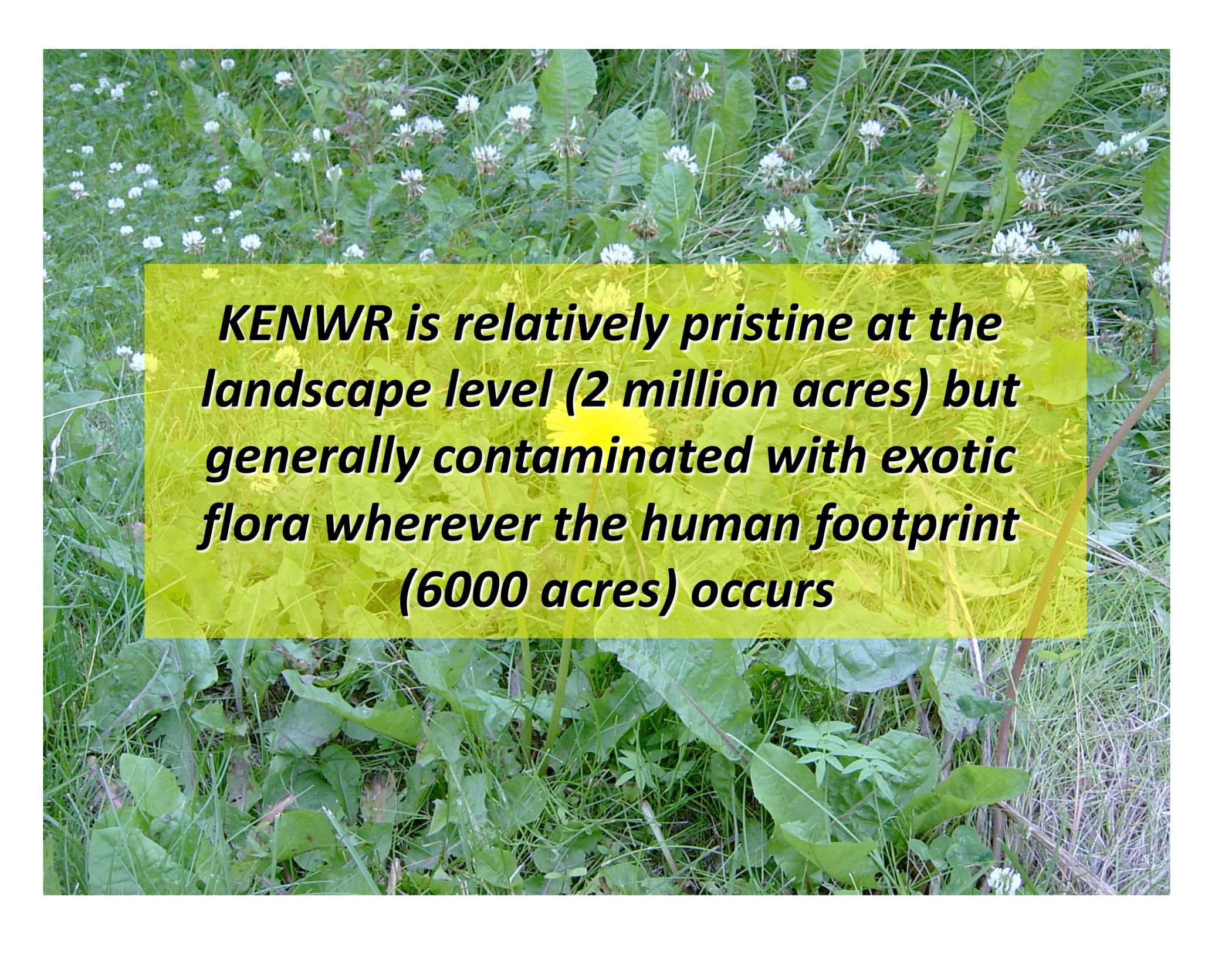
Hieracium caespitosum
Hieracium umbellatum
Melilotus alba
Phalaris arundinacea



Invasive species of concern in Swanson Oil Field

Hieracium caespitosum
Hieracium umbellatum
Melilotus alba
Phalaris arundinacea

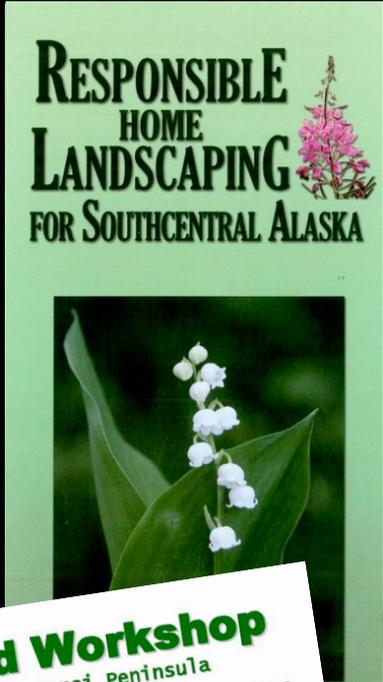
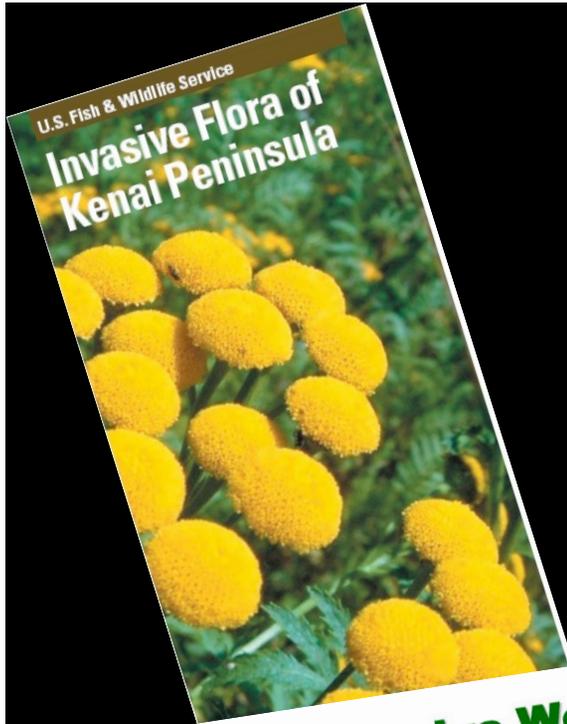


A photograph of a field with green grass and white flowers, overlaid with a yellow text box. The text box contains the following text:

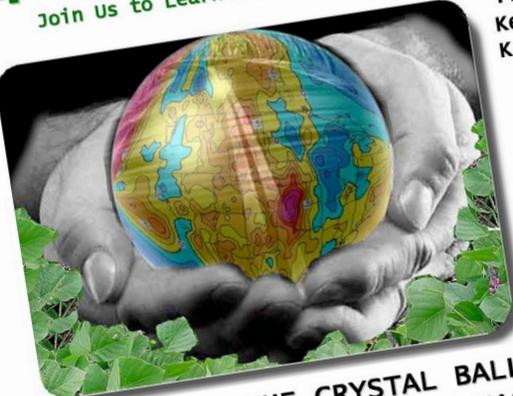
KENWR is relatively pristine at the landscape level (2 million acres) but generally contaminated with exotic flora wherever the human footprint (6000 acres) occurs

So how are we “fixing”
these problems?





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 Stemmoms - Homer Soil and Water Conservation District
- 11:30 Gino Graziano - Alaska Association of Conservation Districts
- IPM Samuel Terpstra - 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 Jahus - 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



07.22.2006



KENAI PENINSULA COOPERATIVE WEED MANAGEMENT AREA

[Home](#) ▶

[About the Kenai Peninsula CWMA](#) ▶

[Events Calendar](#) ▶

[Invasive Species](#) ▶

[Educational Materials](#) ▶

[Programs & Projects](#) ▶

[Publications & Minutes](#) ▶

[Photo Gallery](#) ▶

[Links & Resources](#) ▶

[Partners](#) ▶

[Report Invasive Species](#) ▶

[FAQ](#) ▶

[Contact Us](#) ▶

LEARN ABOUT INVASIVE SPECIES
IN YOUR AREA ▶

EDUCATIONAL
MATERIALS ▶

Welcome to the Kenai Peninsula CWMA

The Kenai Peninsula Cooperative Weed Management Area (KP-CWMA) is a volunteer organization dedicated to prevent the introduction and manage the spread of non-native, invasive weeds across the Kenai Peninsula. KP-CWMA is composed of various non-profits, tribal organizations, and governmental agencies.

Created in 2003, KP-CWMA and its many partners are leading efforts to manage invasives in public and private lands across the Kenai Peninsula. Through our partners hard work, several species have been eradicated from the Kenai Peninsula and numerous acres of critical fish and wildlife habitats have been protected. But the fight must go on!

To better manage invasive across the Kenai Peninsula, KP-CWMA is actively recruiting volunteers and partner agencies! Use this website and learn more about all the exciting opportunities to educate youth, protect our invaluable natural resources, and prevent the spread of invasives across the Kenai Peninsula.

For more information feel free to contact the Homer Soil and Water Conservation District at 235-8177 ext. 5.



KP-CWMA Youth Crew pulling invasive white sweetclover on the Resurrection River, Seward.

Invasive of the Month



Perennial Sowthistle
Sonchus arvensis
Sunflower family

Events Calendar

October 2010						
S	M	T	W	T	F	S
26	27	28	29	30	01	02
03	04	05	06	07	08	09
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	01	02	03	04	05	06

[Year View](#)

[Suggest and Event for our Calendar](#)

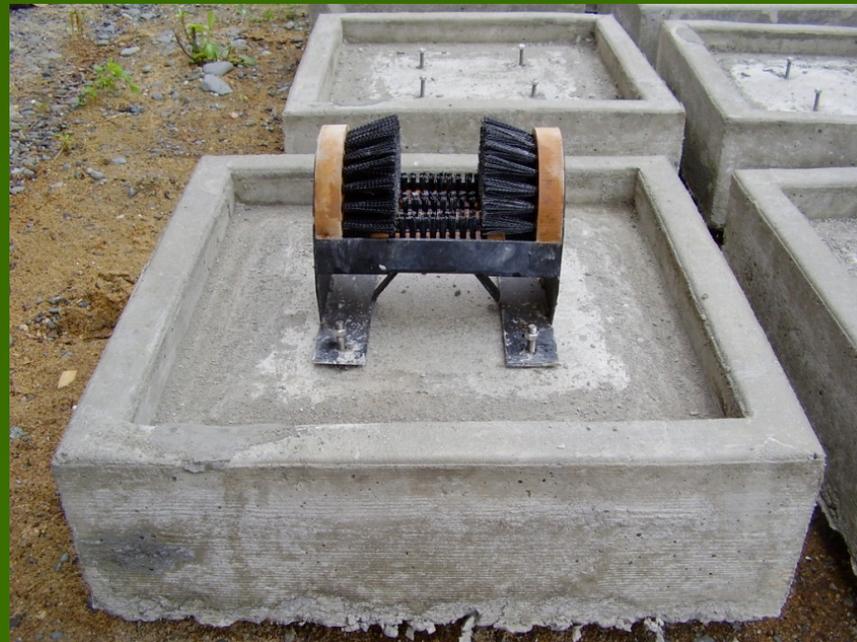


Boot brushes

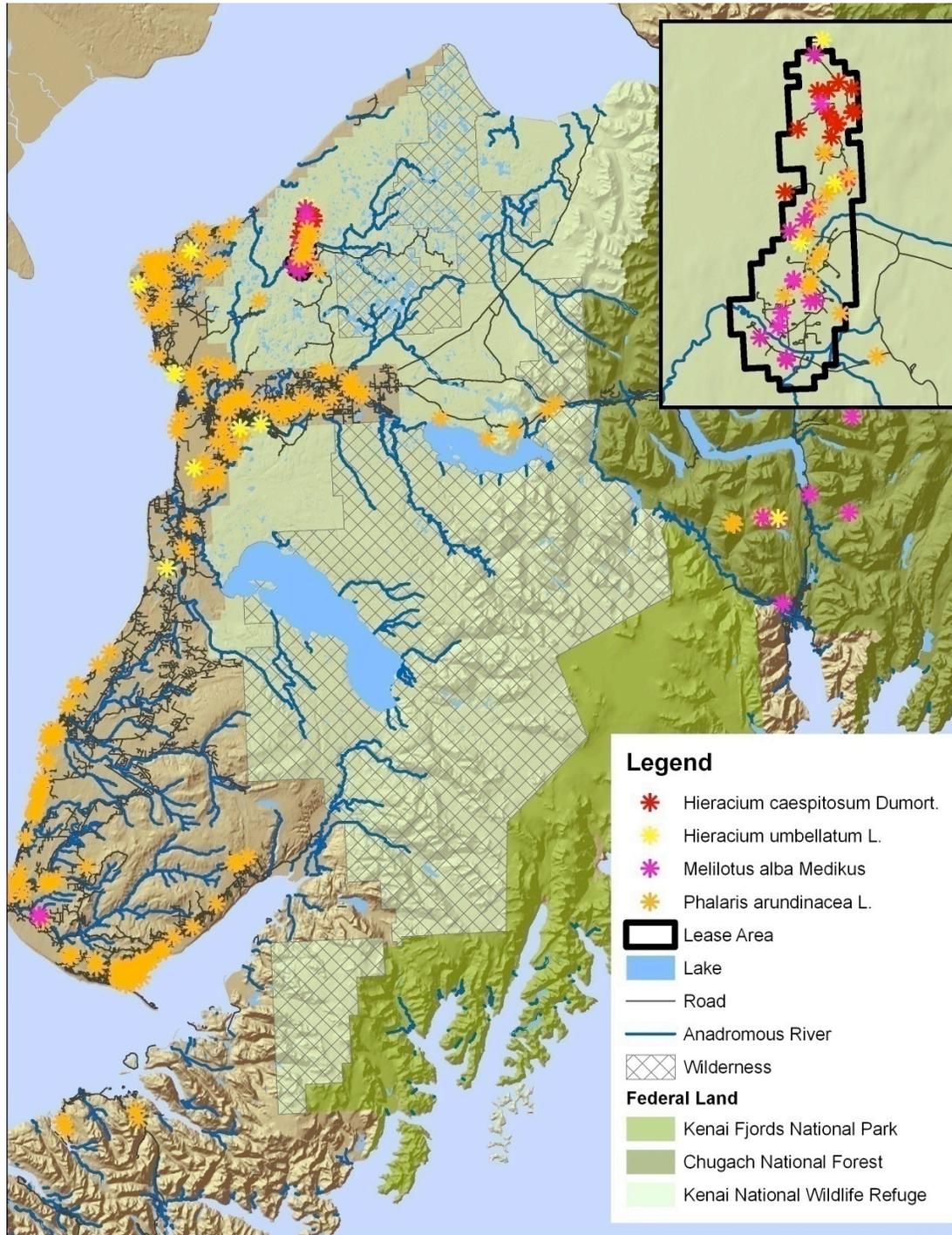


Weed-Free Trail

By using this boot brush before hiking the trail you remove invasive and exotic weed seeds that could harm native plants and wildlife.



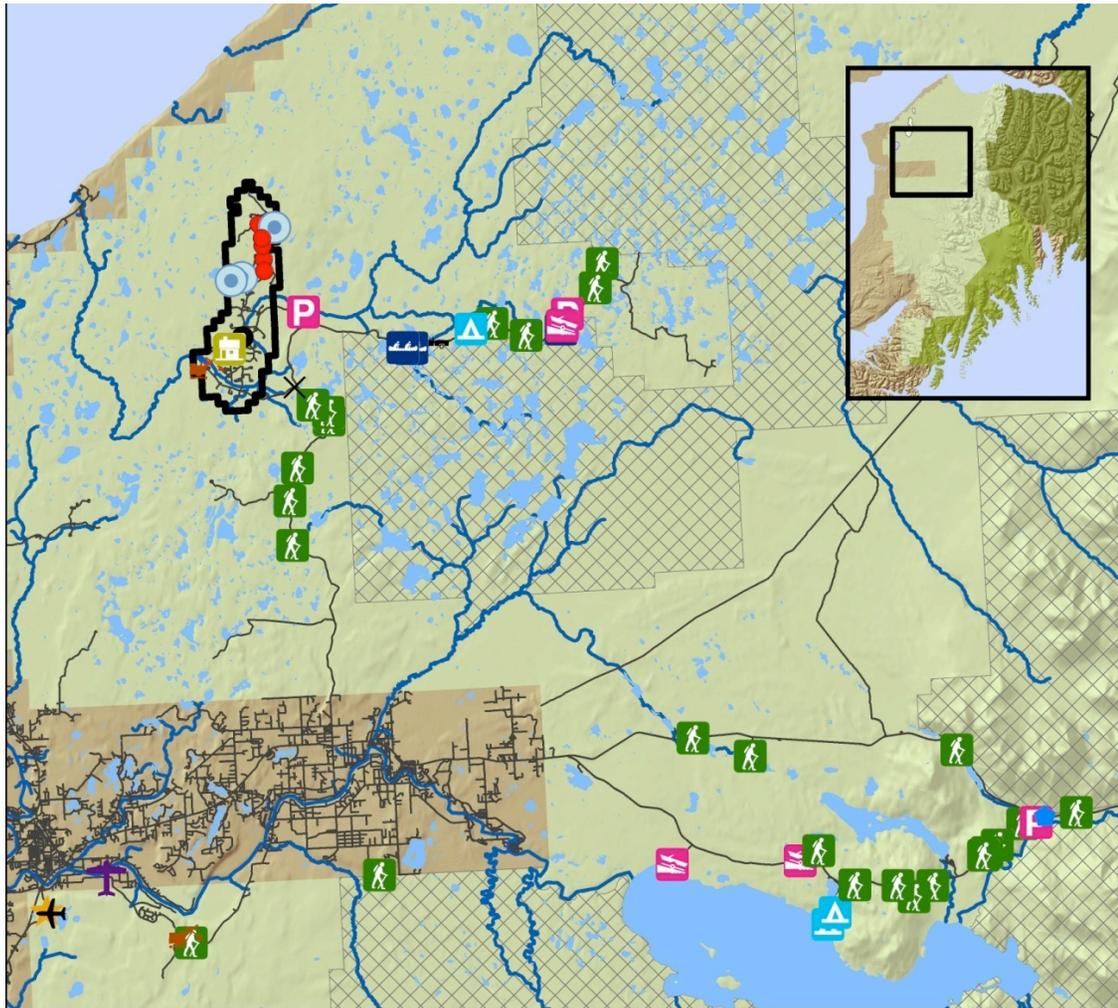




Species-specific targets

Hieracium caespitosum
Hieracium umbellatum
Melilotus alba
Phalaris arundinacea





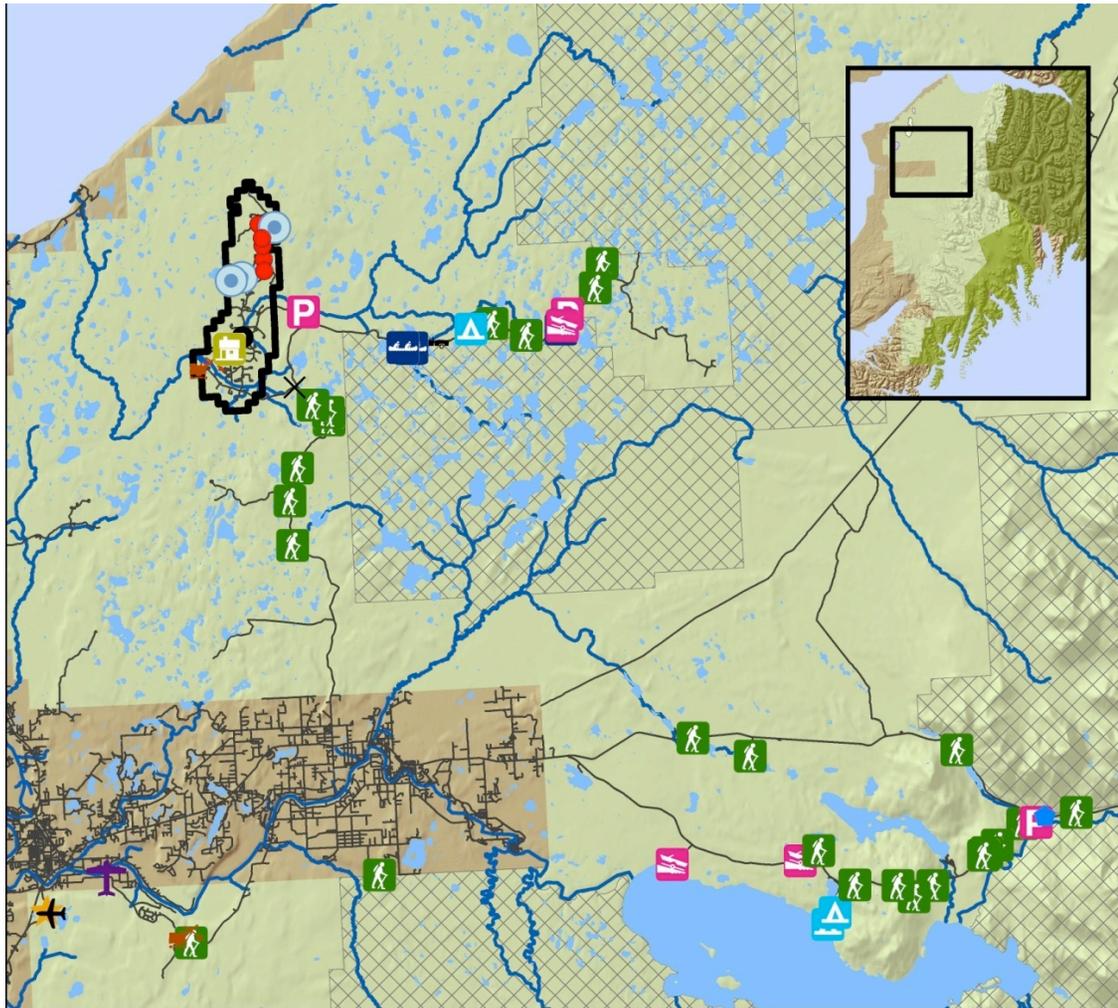
Legend

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
○ Conoe Parking	🅑 Parking	🌊 Well Pad	Federal Land
			🌿 Kenai Fjords National Park
			🌲 Chugach National Forest
			🌱 Kenai National Wildlife Refuge

Spatially-explicit targets

29 trail heads
 6 boat launches
 2 horse trails
 Soldotna hangar
 float plane launch
 equipment/facilities yard
 Swanson Oil Field





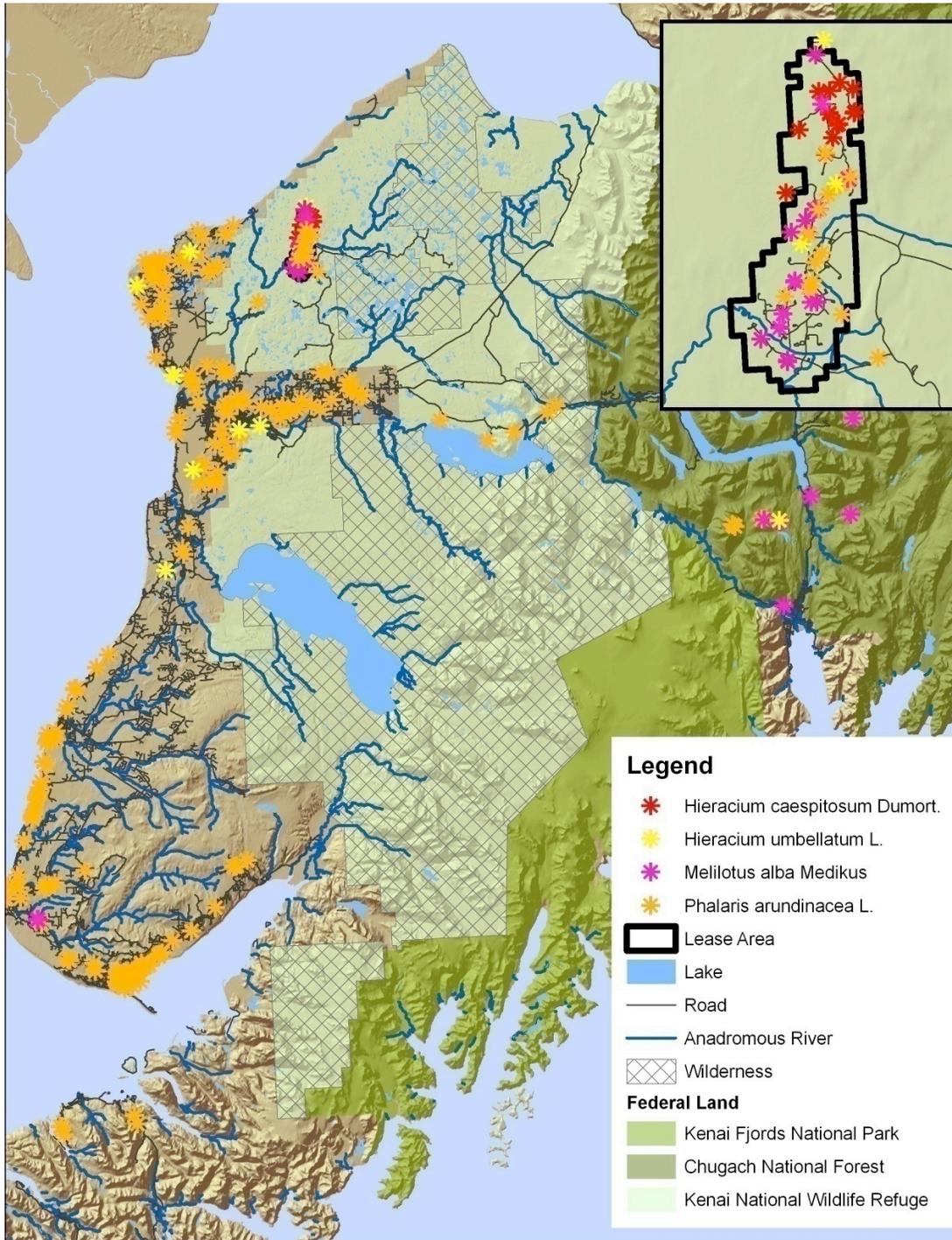
Legend

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
○ Conoe Parking	P Parking	🌊 Well Pad	Federal Land
			■ Kenai Fjords National Park
			■ Chugach National Forest
			■ Kenai National Wildlife Refuge

Herbicides used

26 gal glyphosate
 3.5 gal Transline (2009)
 0.5 gal Milestone (2010)

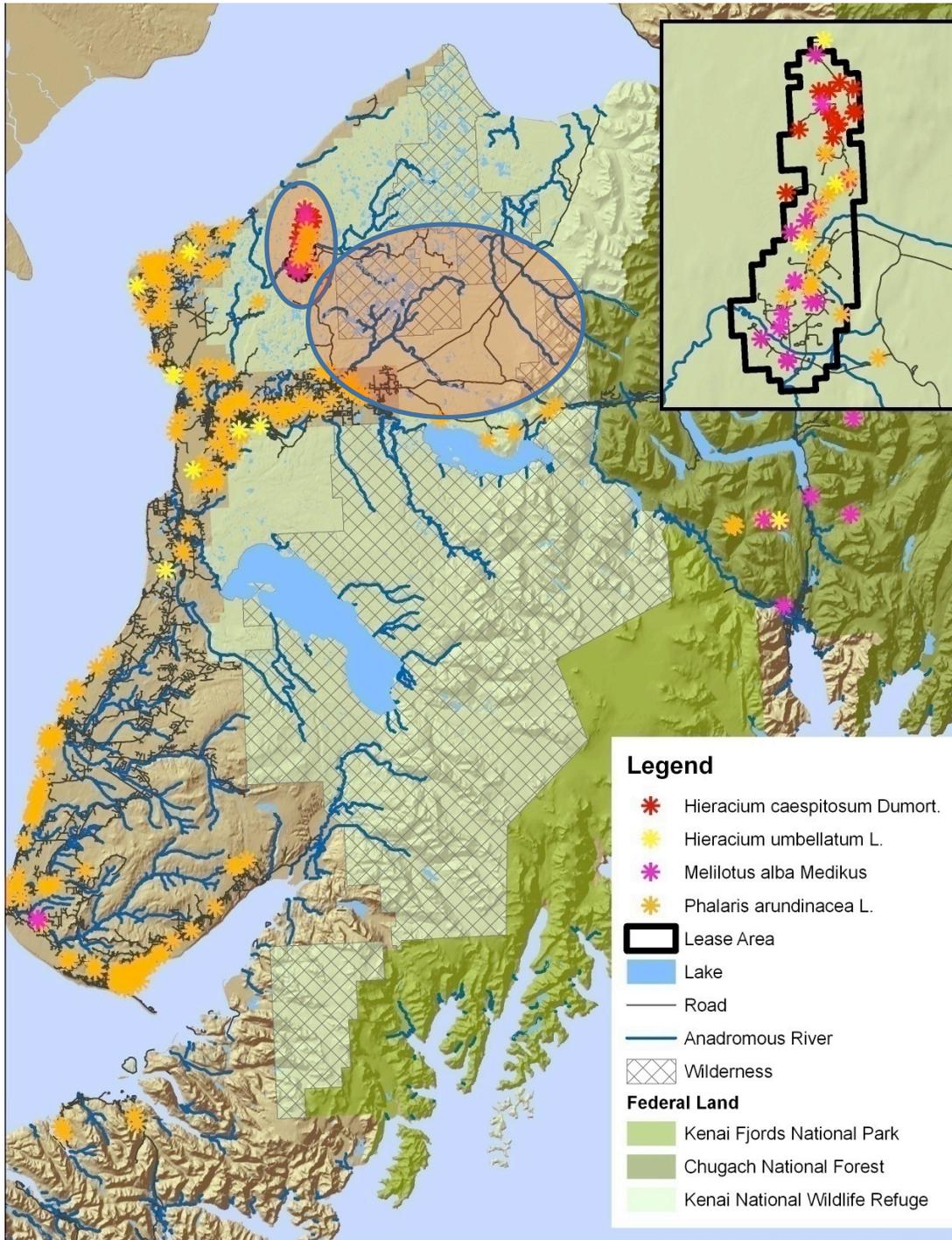




Off-refuge lands

Federal lands =
4.37million acres (73%)

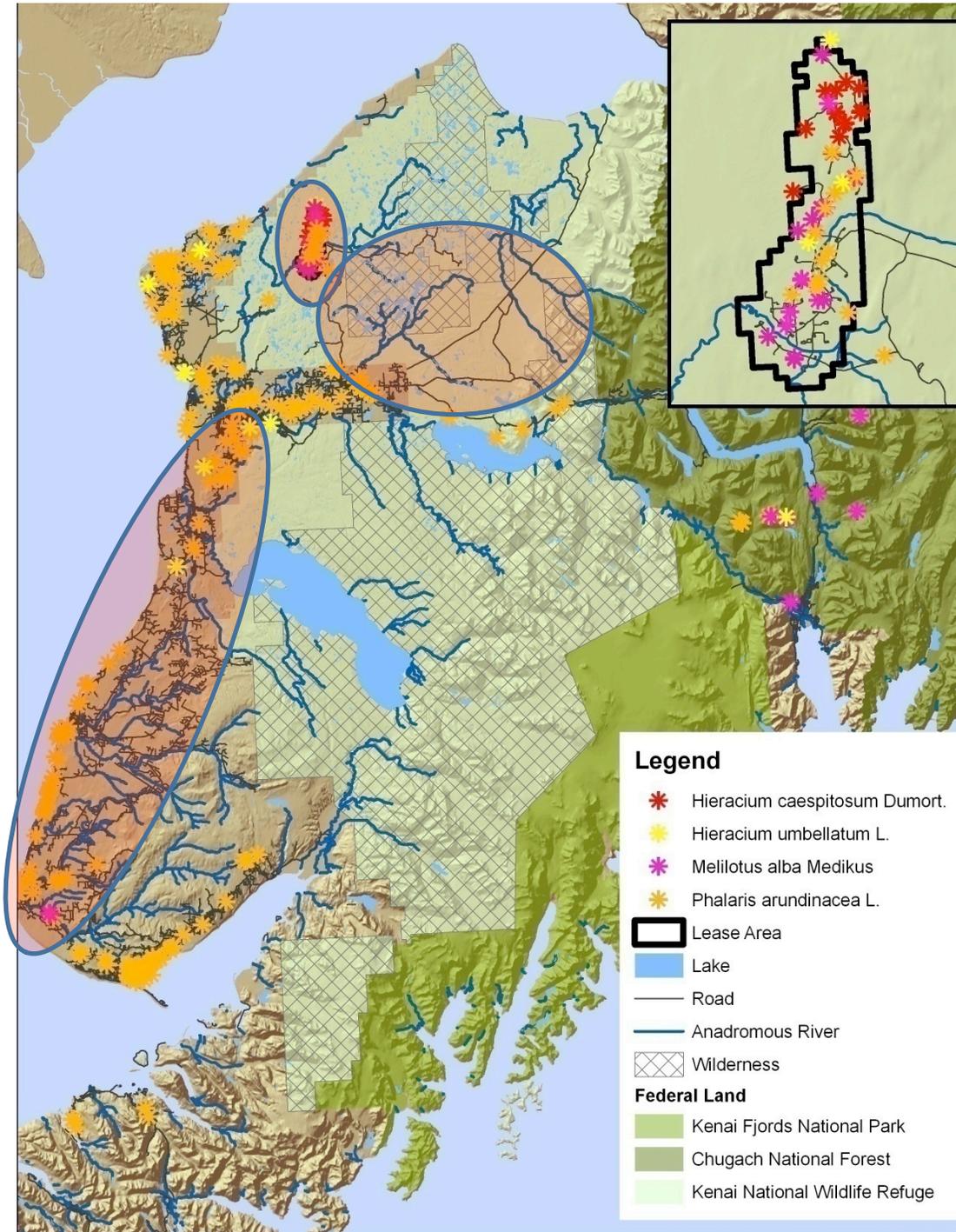
Nonfederal lands = 1.65
million acres (27%)



Off-refuge lands

Federal lands =
4.37million acres (73%)

Nonfederal lands = 1.65
million acres (27%)



Off-refuge lands

Federal lands =
4.37million acres (73%)

Nonfederal lands = 1.65
million acres (27%)



Roads not only impact watershed continuity but make streams vectors for invasives!

- ✓ 3,016 miles of road
- ✓ Intersect anadromous streams at 381 locales





Lots of culverts

Culverts (bridges, arches, box culverts, culverts) = **519**

No culvert = **25**

Need repair = **15**



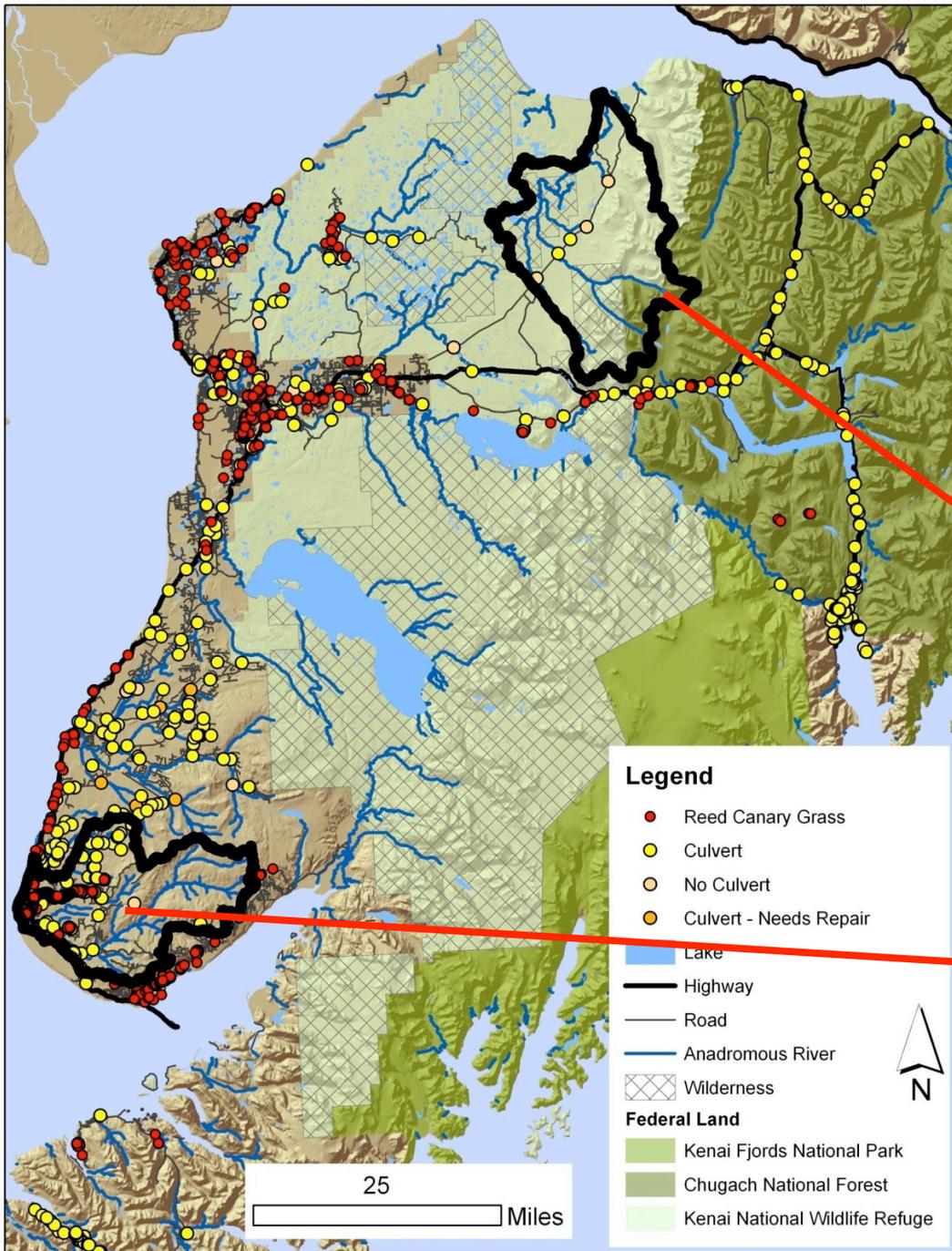


Reed canary grass threatens almost every stream on the Kenai!

735 locations in AKEPIC
11 anadromous streams

Anchor River
Beaver Creek
Bishop Creek
Chakok River
Deep Dreek
Kenai River
North Forth Anchor River
Slikok Creek
Stariski River
Swanson River



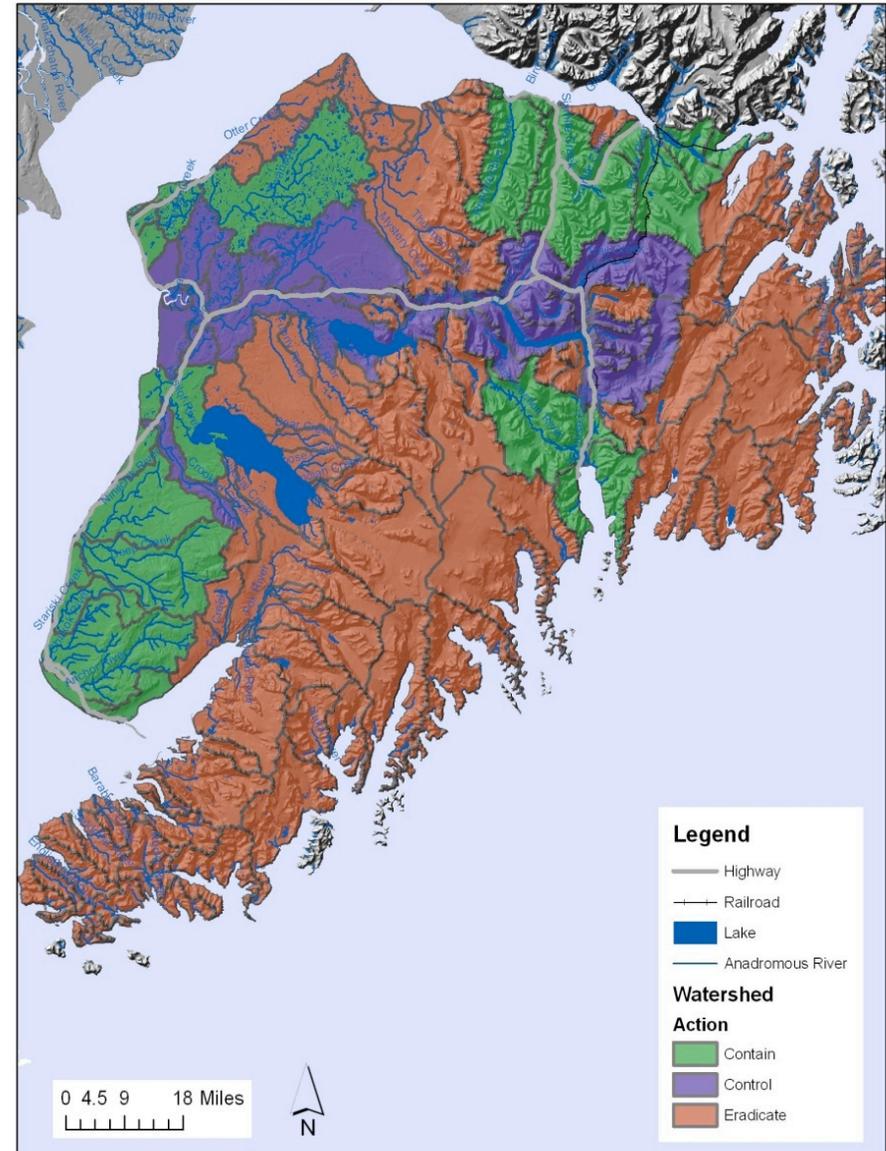
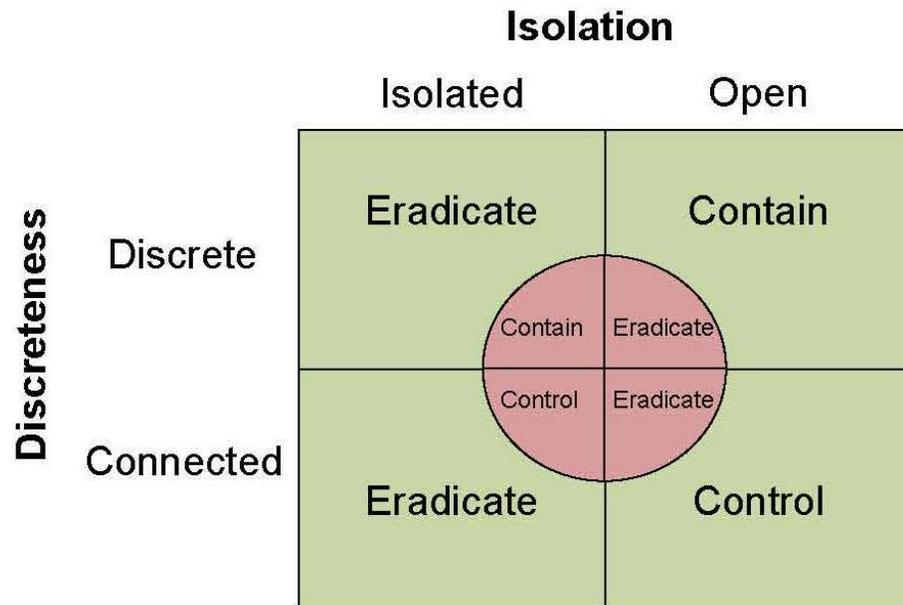


**Time to cut
our losses?**

Chickaloon River

Anchor River

Landscape approach: Managing reed canary grass on 127 watersheds



Lessons Learned



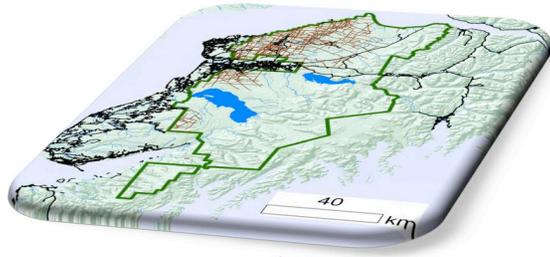
Herbicides should be used sooner than later to...

- ✓ Eradicate incipient populations of new species
- ✓ Eradicate geographically-isolated populations
- ✓ Keep areas of access clean
- ✓ Do the permitting process **NOW**

List of priority species are OK but spatially-explicit strategies are needed

- ✓ Consider isolated watersheds to protect
- ✓ Consider vectors and bottle necks

When do we stop using chemicals?



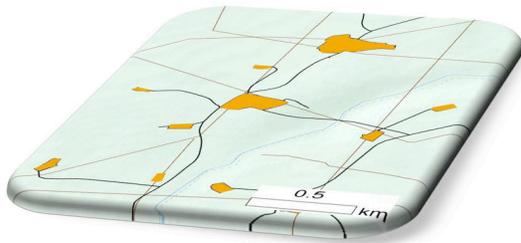
Refuge-wide

n = 255



Human footprint

n = 74



Project-specific

n = 62



Questions????