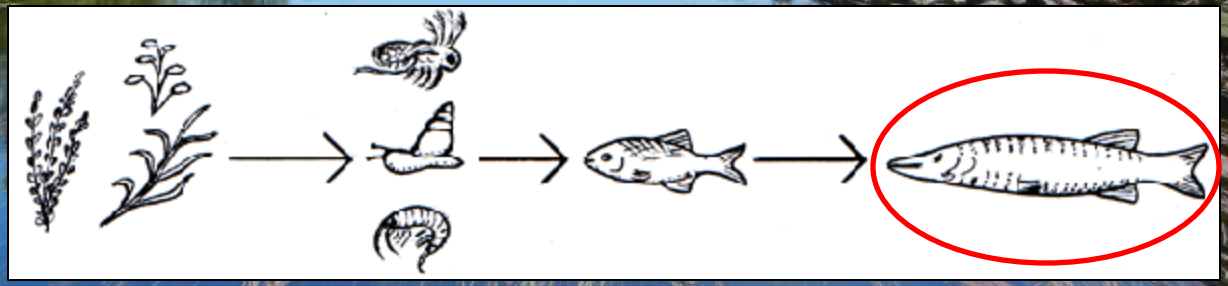
Invasive Northern Pike Control in Southcentral Alaska

Kristine Dunker, Regional Invasive Species Coordinator
Alaska Dept. of Fish and Game, Division of Sport Fish

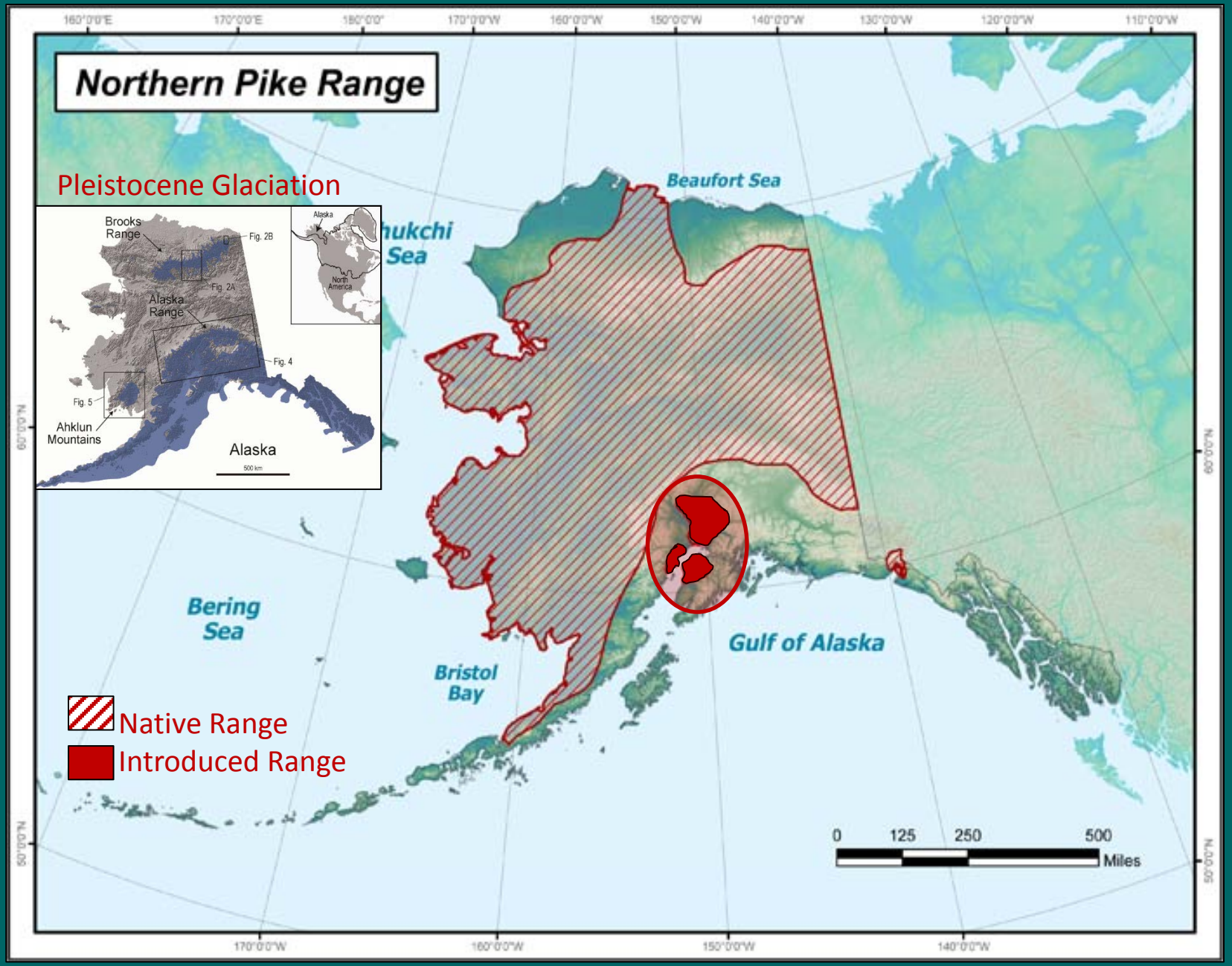


Walleye and Northern Pike:
Boost or Bane to Northwest Fisheries?

By Thomas E. McMahon and David H. Bennett

ABSTRACT

Introductions of nonnative walleye (*Stizostedion vitreum*) and northern pike (*Esox lucius*) have created popular recreational fisheries in many Northwestern waters. Rising demand for expanded angling opportunities for these species, especially walleye, has been met with growing concern about long-term risks associated with the introduction of a top predator. Proposed introductions are often controversial because of potential prey depletions, reductions in salmonid populations, and long-range movements of the species from the point of release. We urge a cautious approach to future introductions of these species in the northwestern United States and outline some approaches for evaluating risks and benefits. Stricter risk assessment procedures for species introductions have been adopted by many states, but illegal introductions of both species are a continuing problem. Greater efforts are needed to educate the public about the risks of illegal transplants, and stronger statutes are necessary to discourage this activity.


Northern Pike Range
Pleistocene Glaciation
Brooks Range
Fig. 2B
Fig. 2A
Alaska Range
Fig. 4
Fig. 5
Ahklun Mountains
Alaska
500 km
Alaska
North America
Beaufort Sea
Chukchi Sea
Bering Sea
Bristol Bay
Gulf of Alaska
Native Range
Introduced Range
0 125 250 500
Miles

Invasive Species

Image credit: theresilientearth.com

Image credit: US Fish and Wildlife Service

Image credit: Columbus Dispatch

Invasive Species: a species that has been introduced to an environment where it is non-native, or alien, and whose introduction causes environmental or economic damage or harm to human health.

Source: IUCN 2015

Pink salmon fry in a pike stomach from Alexander Creek

Pike Suppression:

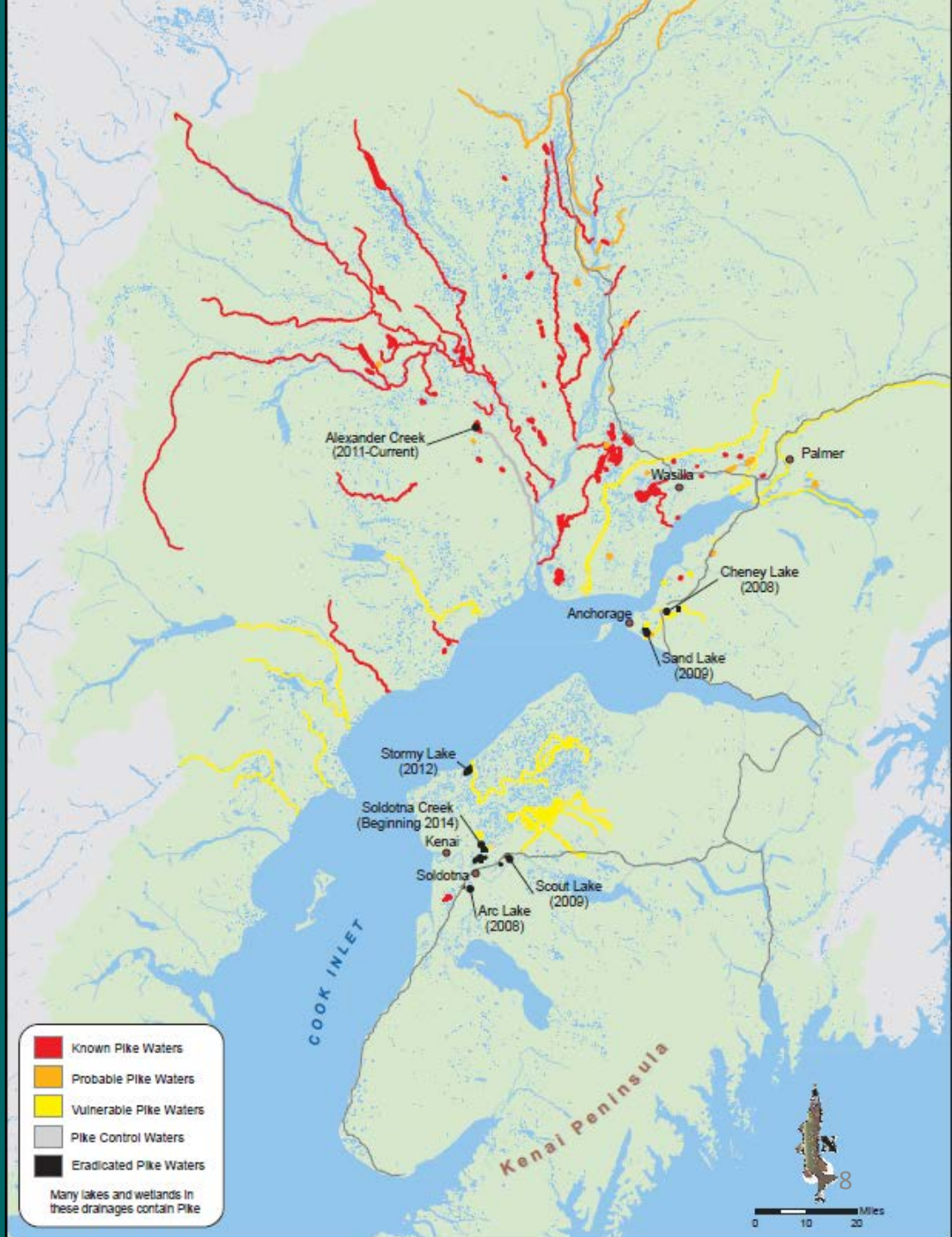
Mat-Su: Alexander Creek

Eradications to Date:

Anchorage: Cheney Lake
Sand Lake
Otter Lake

Yakutat: Village Pond System

Kenai Pen.: Arc Lake
Scout Lake
Stormy Lake
Union Lake
East Mackey Lake
West Mackey Lake
Derks Lake
Sevena Lake
Soldotna Creek
Loon Lake
Tiny Lake
Hall Lake
Warfle's Lake



What is Rotenone?

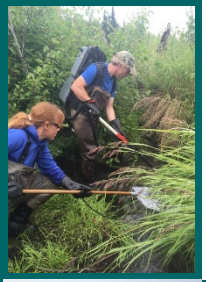
- Extract of tropical “bean family” plants
- Used by indigenous cultures to collect fish
- Used to manage fish in U.S. since 1930s
- Easily absorbed through gill membranes
- Acts by inhibiting cell respiration
- Safe for mammals and birds at fish management concentrations
- Only proven and feasible tool for pike eradication in Southcentral Alaska

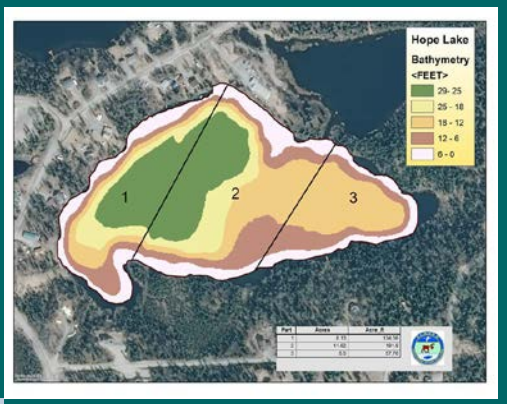
Rotenone Permitting Process

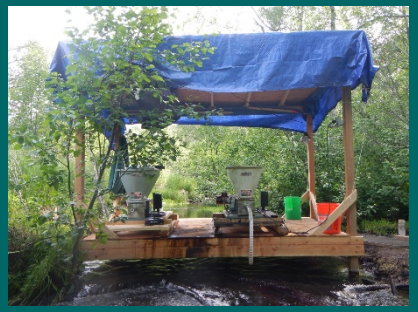
- Public Scoping Process
- Alaska Department of Environmental Conservation: Pesticide Use Permit
  - 30-day public commenting period
- NEPA Process: Environmental Assessment/ FONSI
  - 30-day public commenting period
  - Review and approval done by USFWS
- Alaska Department of Natural Resources: Special Use Permit
- Alaska Department of Fish and Game: Fish Transport Permits
- Alaska Board of Fisheries Approval (AS 16.35.200)

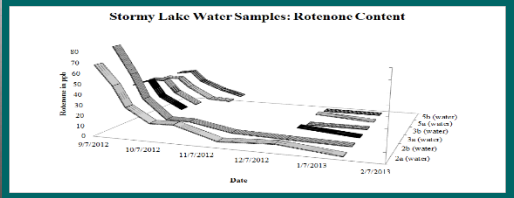
A Rotenone Treatment: Step by Step

- Monitor the physical and biological environment
- Calculate rotenone quantity
- Gillnet pike
- Post signs and stage equipment
- Deploy caged test fish
- Conduct treatment
- Monitor caged test fish
- Deactivation
- Monitor rotenone degradation
- Assess treatment success
- Restore the fishery





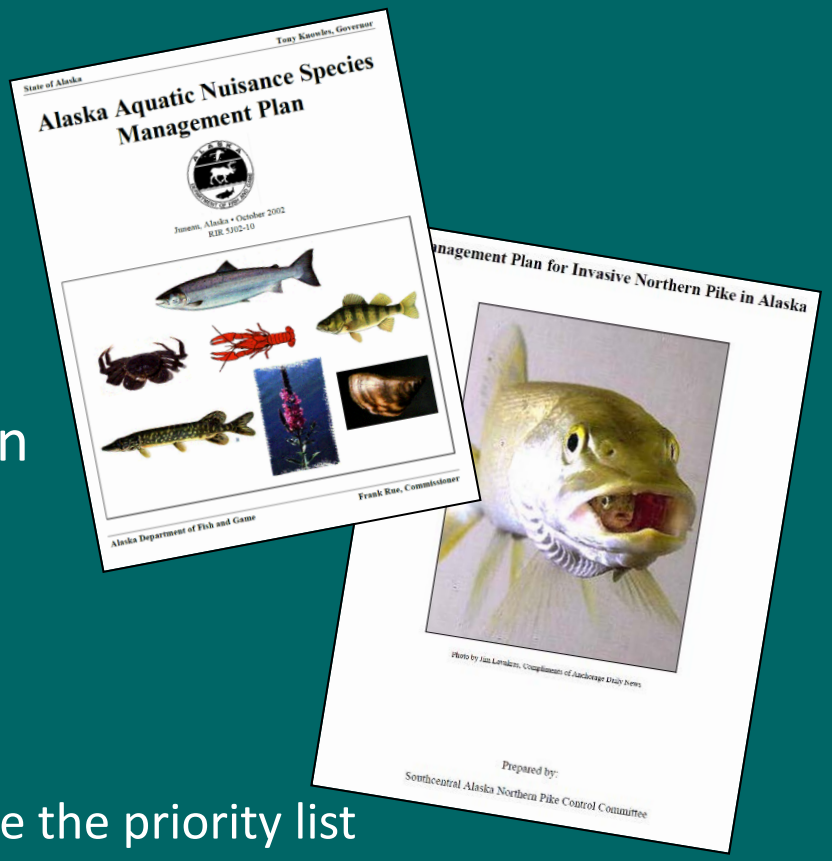




Strategic Planning

Prioritization Process

- Criteria based on:
  - Threats to fisheries
  - Habitat significance
  - Watershed characterization
  - Cultural significance
  - Economic impacts
  - Feasibility



Pike committee meets every two years to update the priority list

⟶ **Prevent Spread**

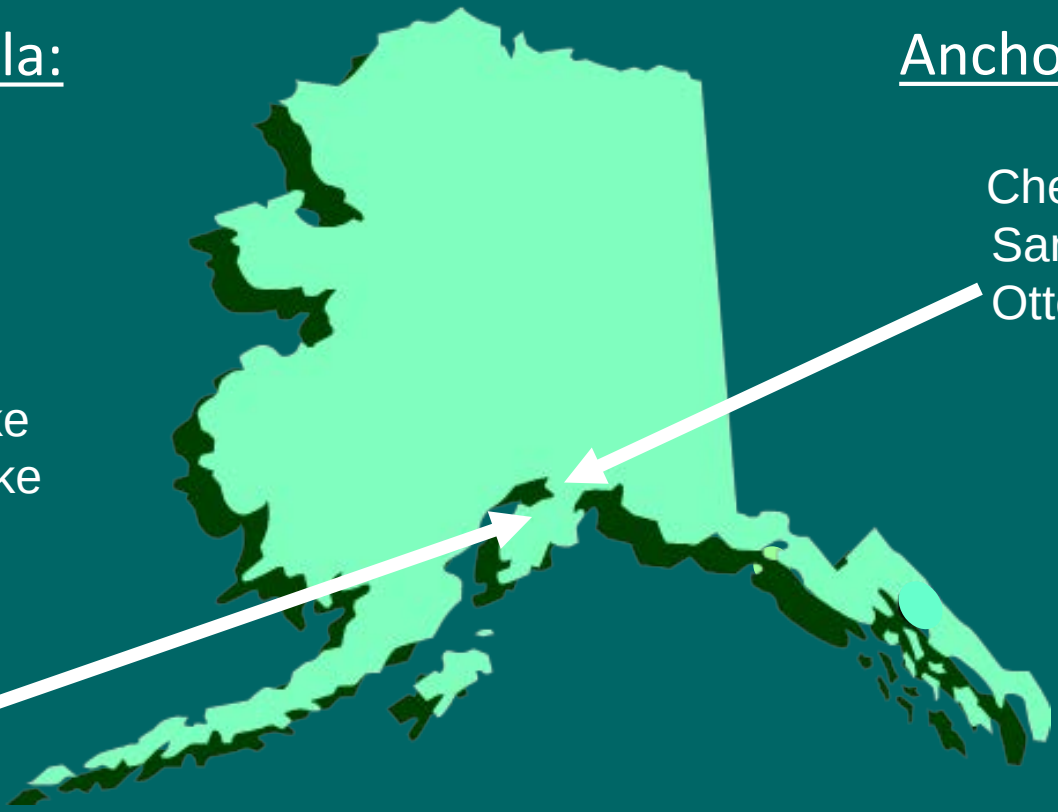
Rotenone Projects (2008-2017)

<u>Kenai Peninsula:</u>

Arc Lake
Scout Lake
Stormy Lake
Union Lake
East Mackey Lake
West Mackey Lake
Derks Lake
Sevena Lake
Loon Lake
Soldotna Creek

<u>Anchorage Area:</u>

Cheney Lake
Sand Lake
Otter Lake



All high priority projects to prevent pike from spreading

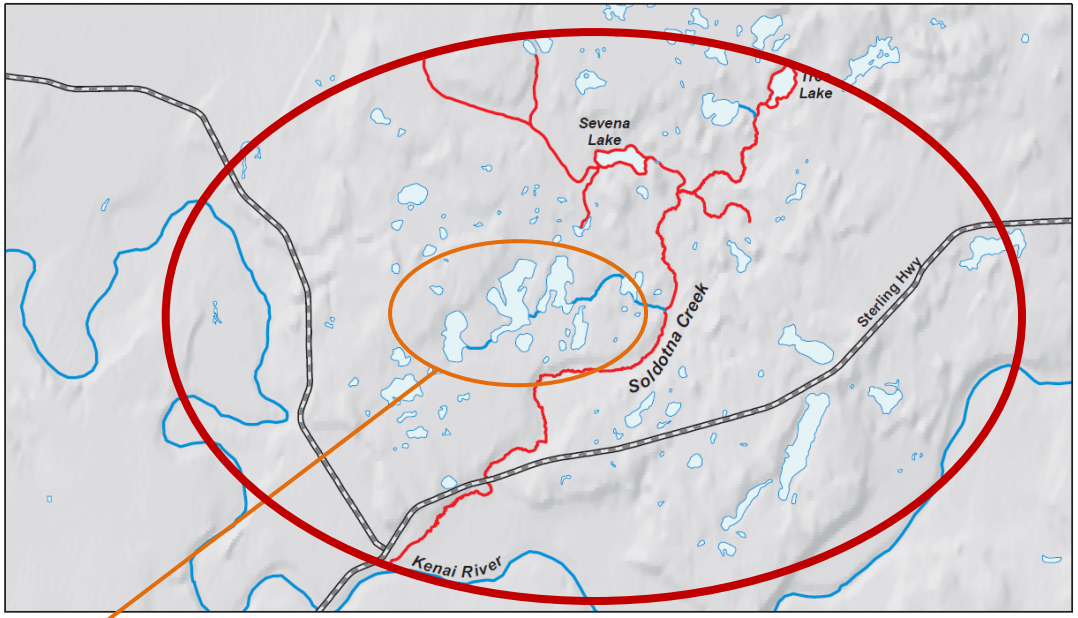
SOLDOTNA CREEK

Soldotna Creek Treatment Areas

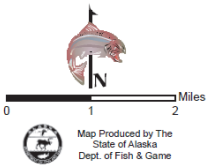
Area 1

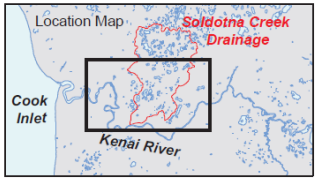
Union Lake, West Mackeys Lake, East Mackeys Lake, Derks Lake

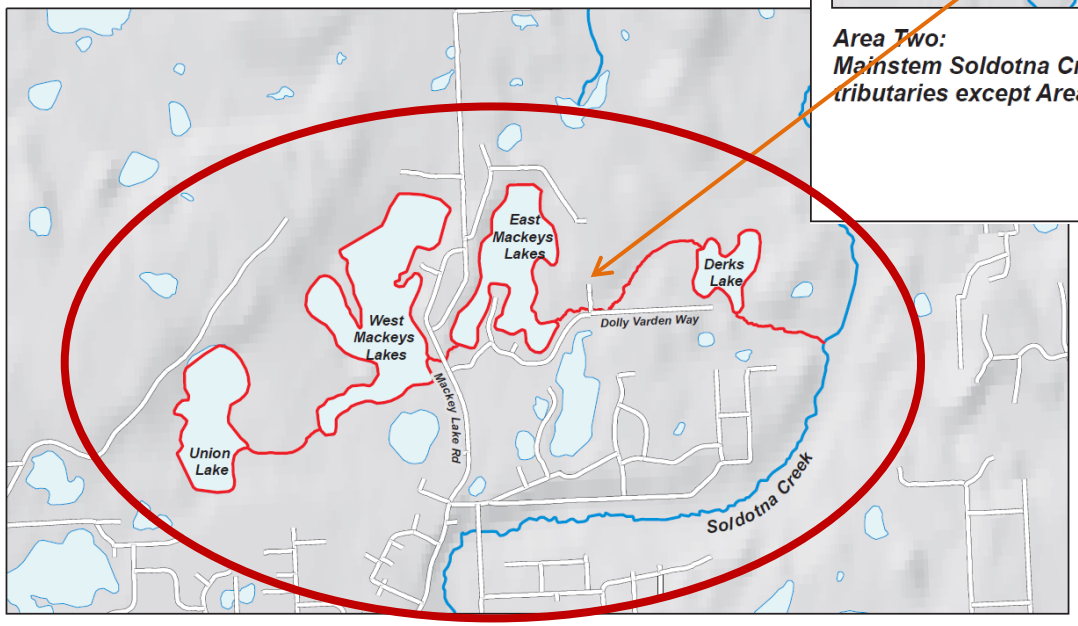
Treatment Timing: 2014



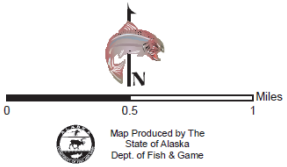
Area Two:
Mainstem Soldotna Creek and all tributaries except Area One

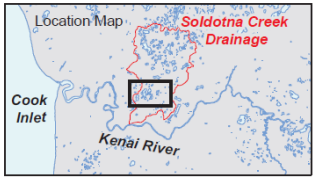


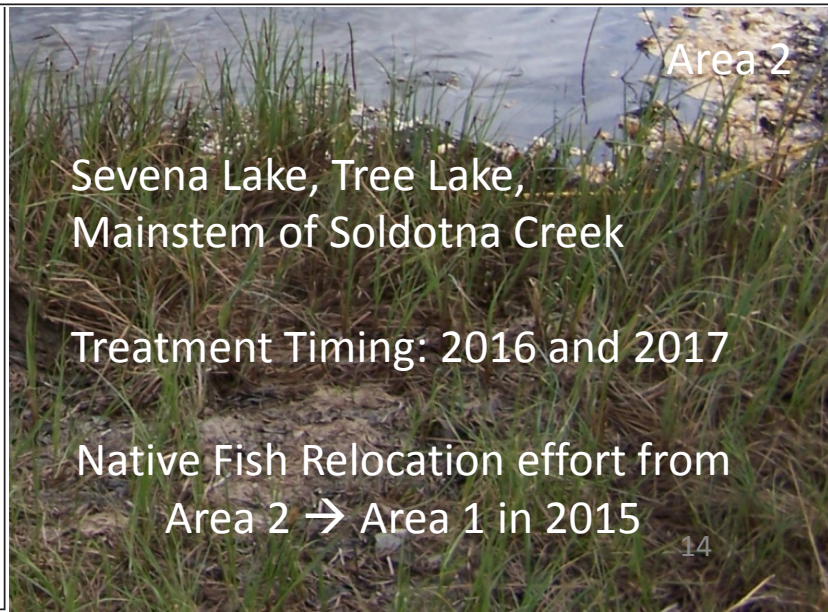




Area One:
Western Branch of the Soldotna Creek Drainage







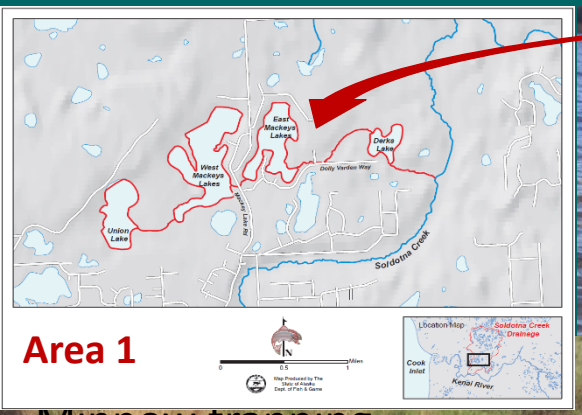

SOLDOTNA CREEK
TREATMENTS
FISH & GAME

Post-Treatment Evaluations



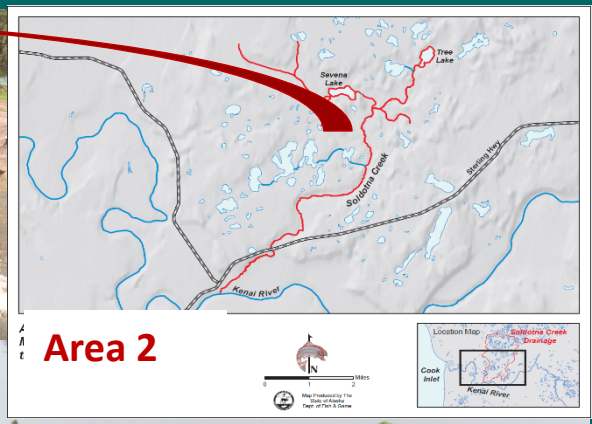


Native Fish Rescue/Restoration 2015-2017



Area 1

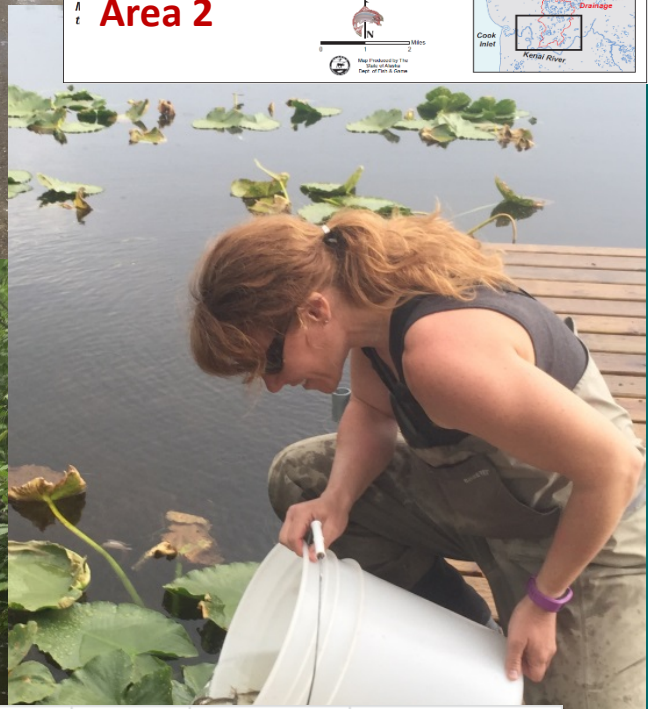
Lake stocking



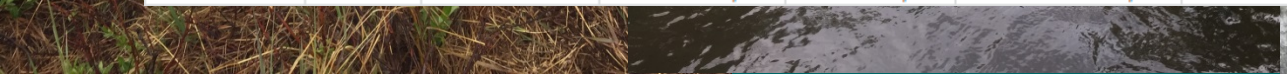
Area 2

Minnow trapping

Electrofishing



Lake	Acres	Years	Rainbow Trout	Dolly Varden	Juv. coho salmon	Stickelback	Sculpin	Grand Total	Salmonids/Acre
Union	84	2015-2017	510	710	9,965	7,095	616	18,896	**133**
W. Mackey	184	2015-2017	1,645	2,027	17,666	11,954	1,461	34,753	**116**
E. Mackey	100	2015-2017	1,149	1,286	10,466	9,465	1,399	23,765	**129**
Derks	37	2015-2017	229	378	8,552	4,336	232	13,727	**248**
Totals	405		3,533	4,401	46,649	32,850	3,708	91,141	

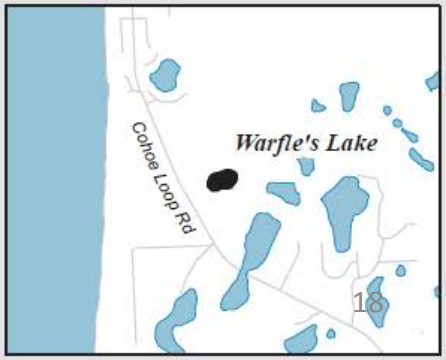


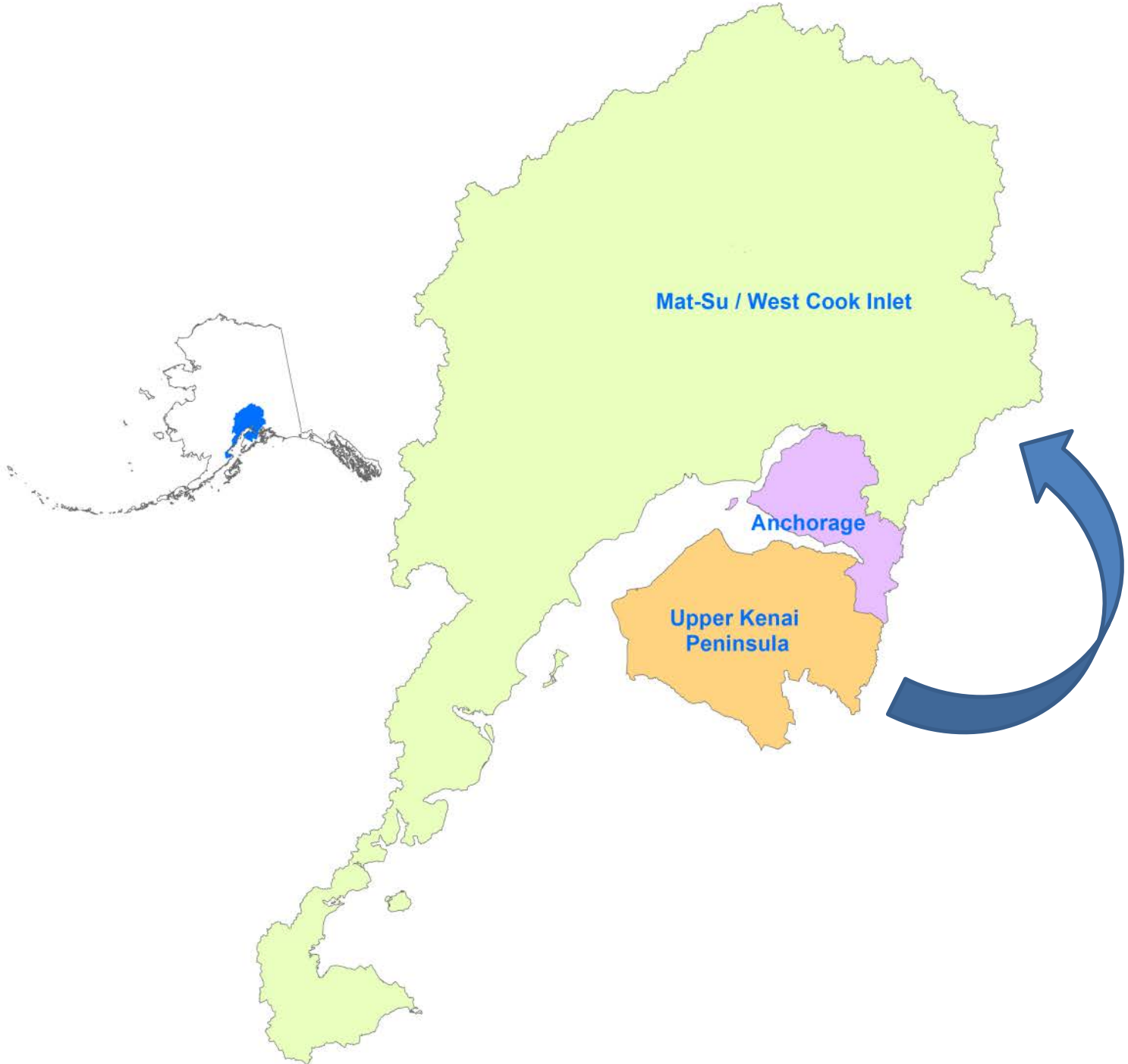
Lake stocking

Current Status of Kenai Peninsula Pike Waters

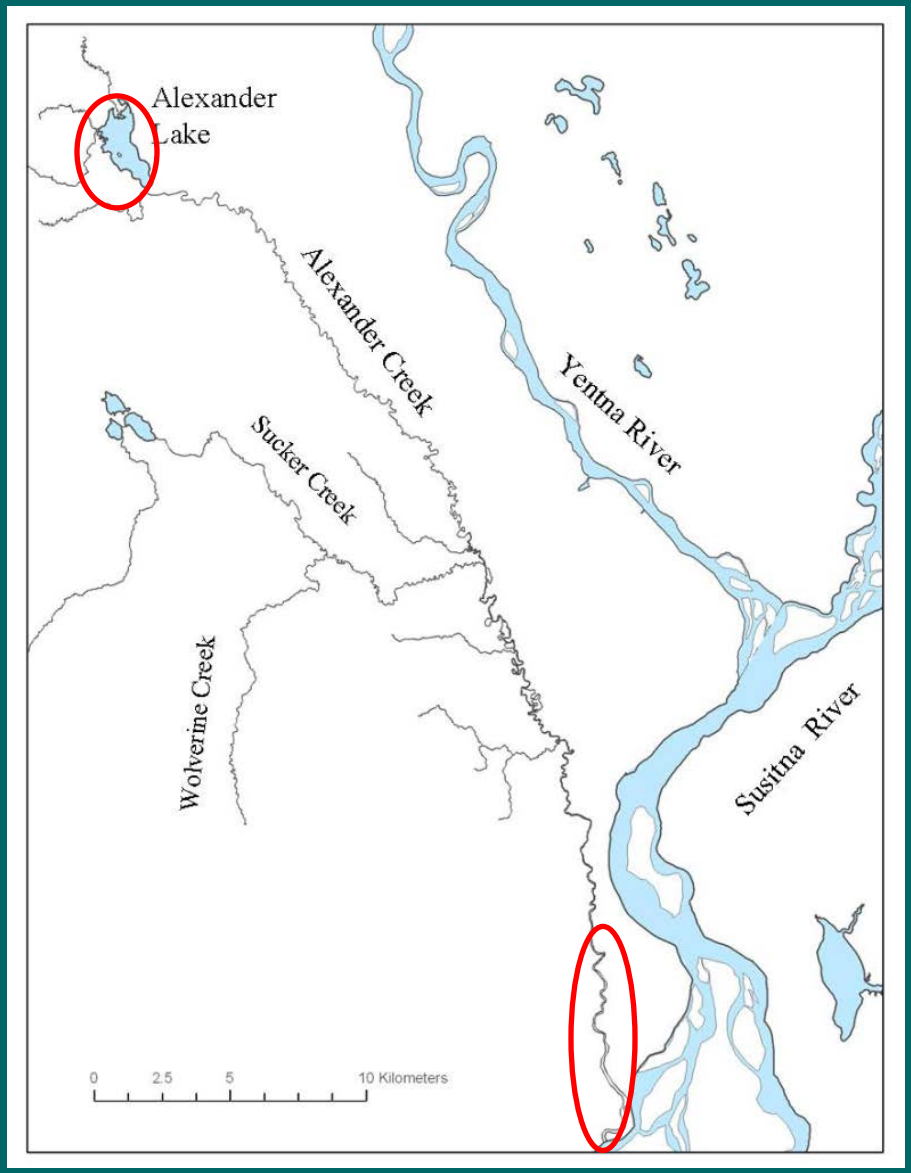
Status of Kenai Peninsula waterbodies where self-sistaining populations of northern pike have occured

- Northern pike population remains present
- Northern pike population eradicated by ADF&G
- Northern pike population disappeared from an unknown cause

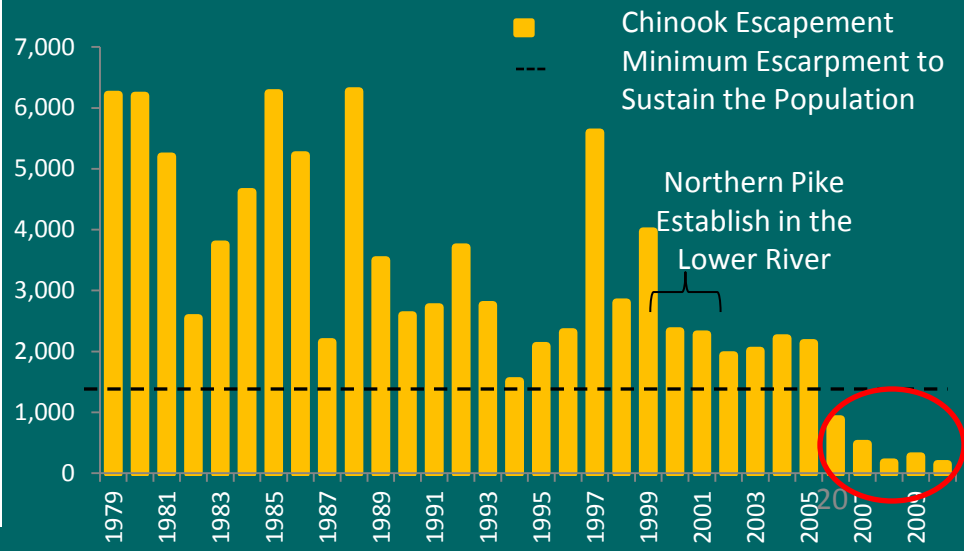



Mat-Su / West Cook Inlet
Anchorage
Upper Kenai
Peninsula

Alexander Creek Pike Suppression



- Susitna River tributary
  - Very productive Chinook salmon fishery prior to 2000
- Pike in the lake for decades
  - Discovered in lower river in late 1990s
- King numbers crashed
  - Other systems were thriving
- All fisheries now closed

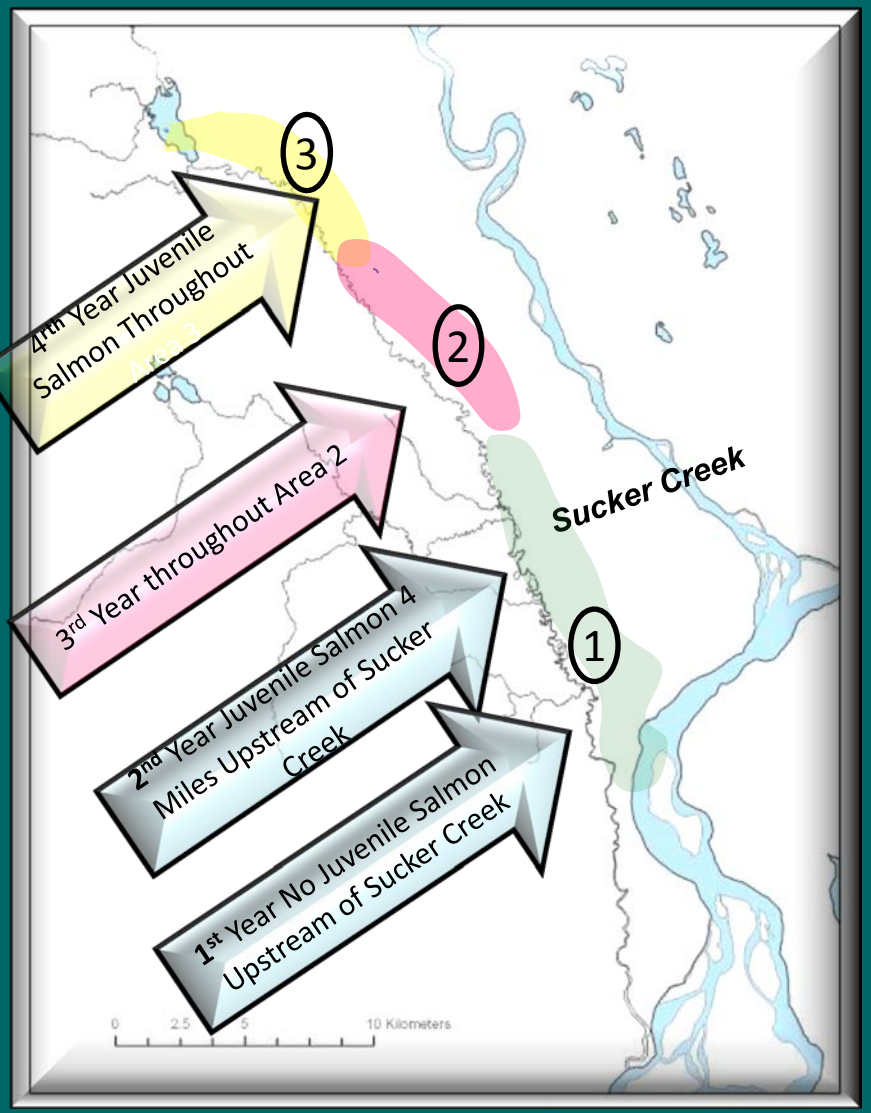


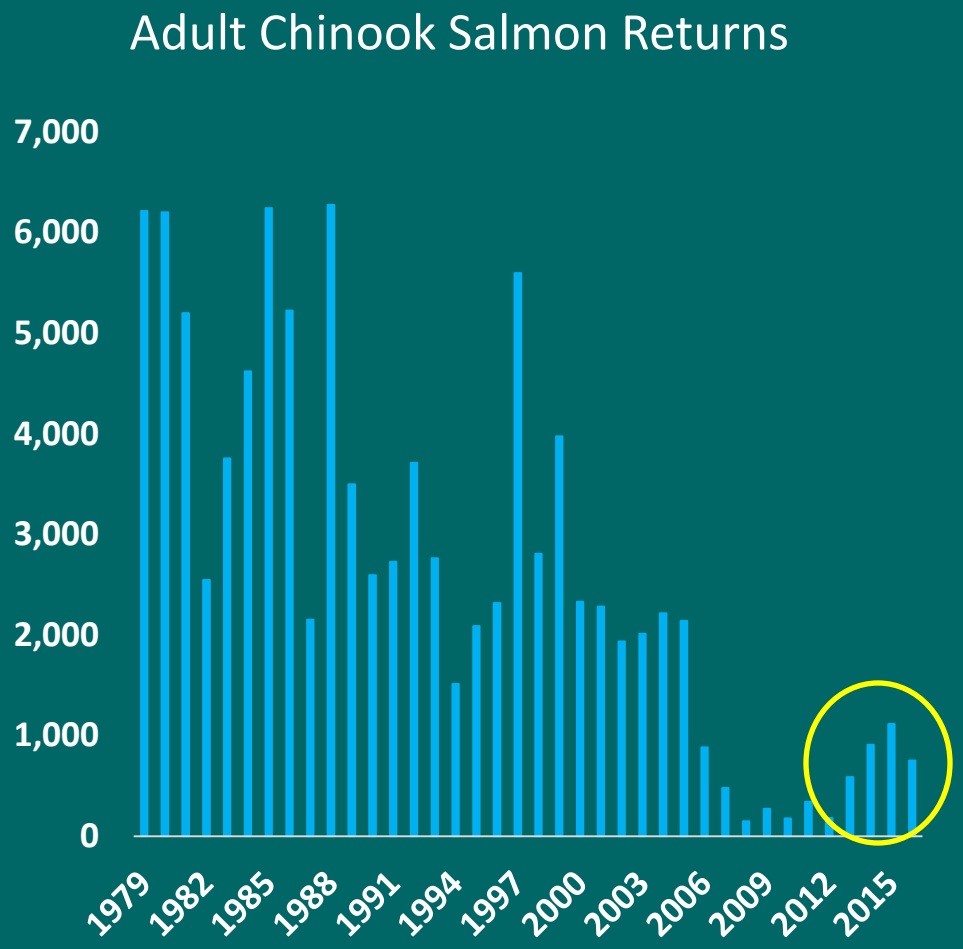
Alexander Creek Pike Suppression

Goal: Drive down pike abundance to allow increased survival of juvenile salmonids

- Reduce pike in side-channel sloughs with gillnets
  - During pike spawning
  - Field crews target ~60 sloughs
  - Annual effort (>19,000 pike removed since 2011)
- Surveys to evaluate juvenile salmonid abundance
  - Minnow trap surveys
  - Pike stomach content analysis

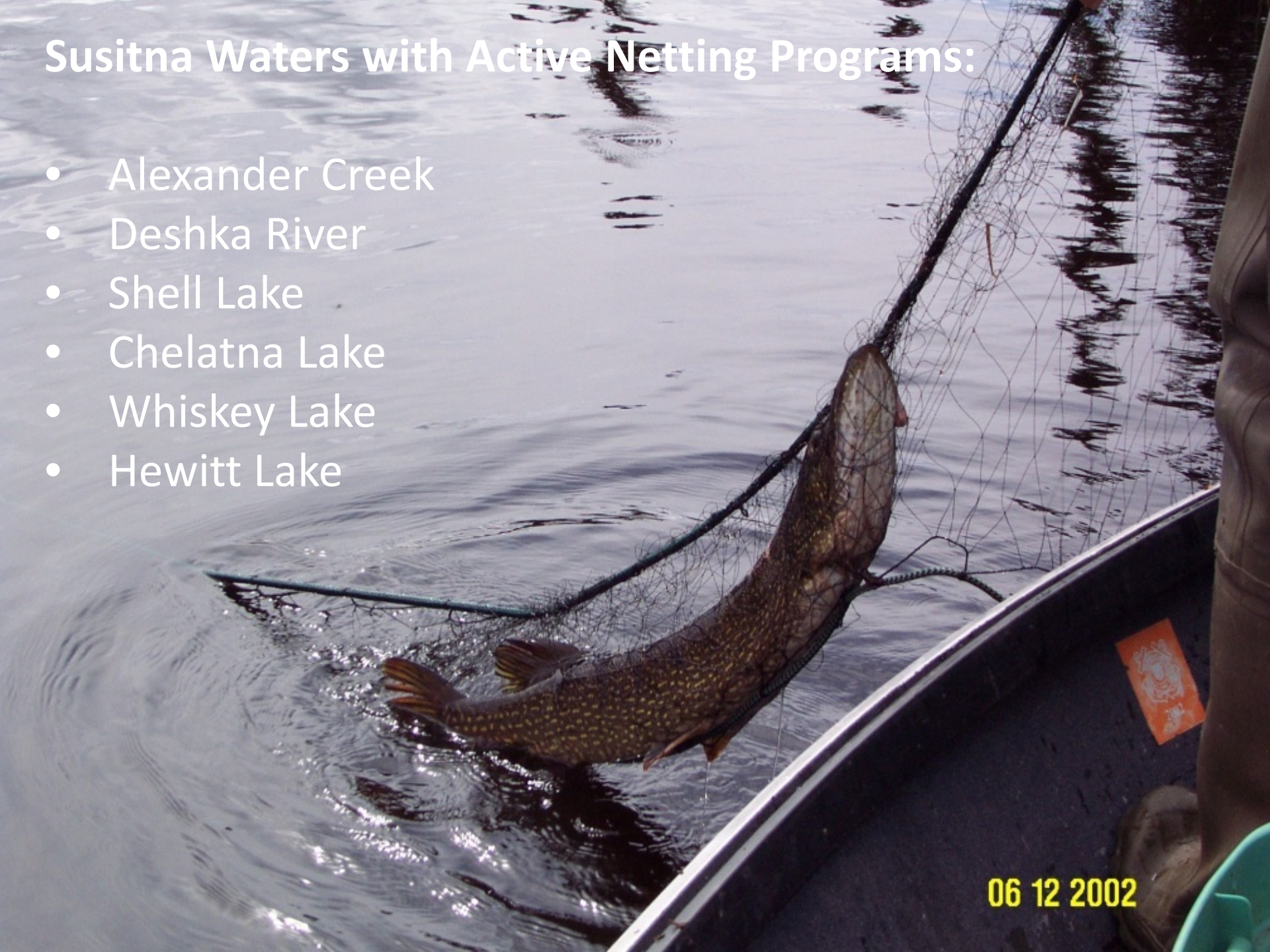
Alexander Creek Pike Suppression





Susitna Waters with Active Netting Programs:

- Alexander Creek
- Deshka River
- Shell Lake
- Chelatna Lake
- Whiskey Lake
- Hewitt Lake



Regional Pike Priorities by Project Scope

Eradication Projects

Project	Area	Cost	Status
Cottonwood Creek Pike Eradication	Mat-Su	$ 203,400	Partially Funded - In Progress
Soldotna Creek Pike Eradication	Kenai	$ 433,400	Complete
Stormy Lake Pike Eradication	Kenai	$ 297,600	Complete
Otter Lake Pike Eradication	Anchorage	$ 140,600	Complete
Lower Fire Lake Pike Eradication	Anchorage	*$ 78,000*	Unfunded
Knik, Prator, Memory Lakes Pike Eradication	Mat-Su	*$ 220,000*	Unfunded
Tote Road Lakes Pike Eradication	Kenai	$ 159,000	Funded - In Progress

Suppression Projects

Project	Area	Cost	Status
Alexander Creek Pike Suppression	Mat-Su	$ 2,055,000	Funded - In Progress
Nancy Lake, Taniana Lake, and Big Lake Area Pike Suppression	Mat-Su	*$ 223,500*	Unfunded
Threemile Northern Pike Suppression	West-Side CI	*$ 70,000*	Unfunded

Monitoring Projects

Project	Area	Cost	Status
Kenai Peninsula Long-Term Pike Monitoring	Kenai	$ 48,000	Funded - In Progress
Threemile Invasive Northern Pike Assessment	West-Side CI	$ 35,000	Funded - In Progress
Anchorage Lake Pike Monitoring	Anchorage	*$ 20,000*	Unfunded
Northern Cook Inlet Comprehensive Pike Assessment	Mat-Su	*$ 524,500*	Unfunded

Research Projects

Project	Area	Cost	Status
Pike eDNA Study	Kenai	$ 39,500	Complete
Alexander Creek Norhtern Pike Movement Study	Mat-Su	$ 126,700	Complete

Thank you

Funding and support provided by:

- Alaska Sustainable Salmon Fund
- Kenai Watershed Forum
- Kenai National Wildlife Refuge
- USFWS Kenai Field Office
- USFWS Conservation genetics Lab, Anchorage
- Mat-Su Borough
- State of Alaska