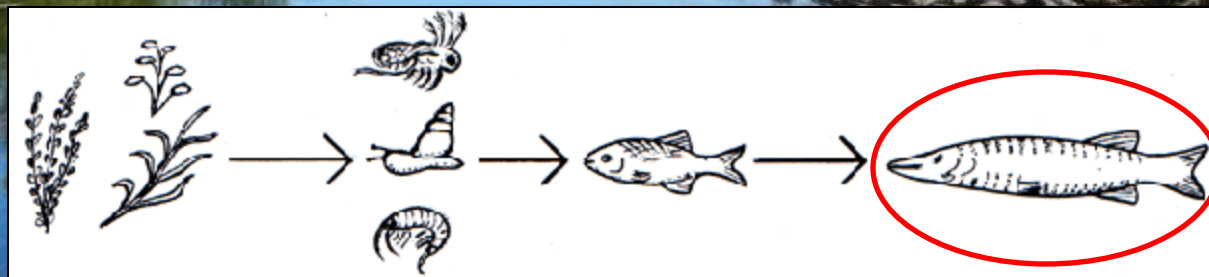
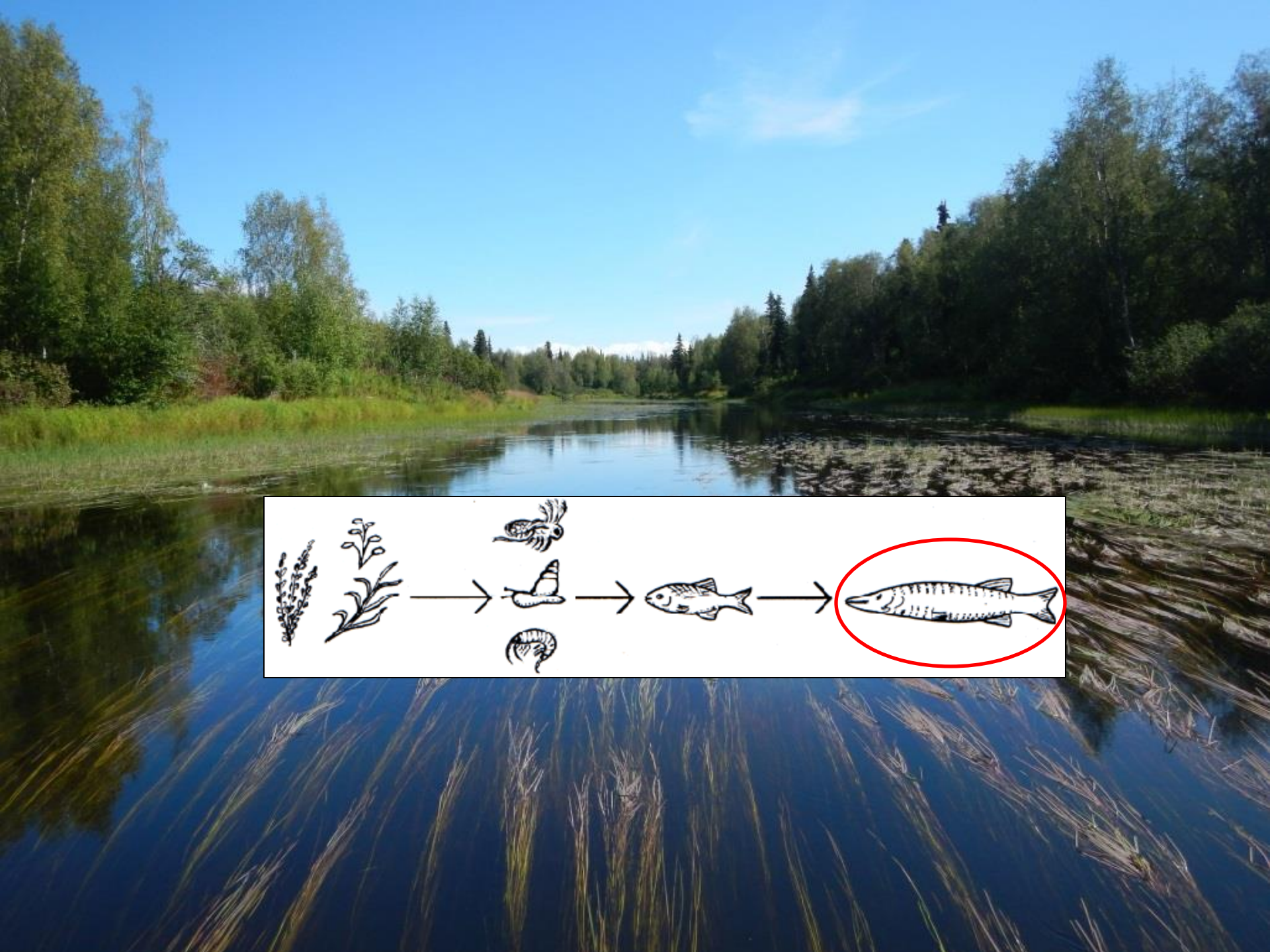


# Invasive Northern Pike Control in Southcentral Alaska



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

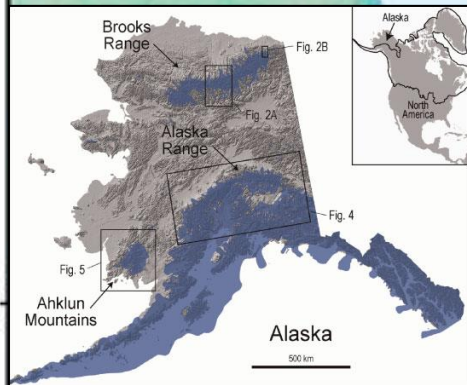
Introductions of nonnative walleye (*Stizostedion vitreum*) and northern pike (*Esox lucius*) have created popular recreational fisheries in many Northwestern waters. Rising demand for expanded angling opportunities for these species, especially walleye, has been met with growing concern about long-term 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



-  Native Range
-  Introduced Range



# 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



Salmon fingerlings in pike stomachs from Alexander Creek





## Pike Suppression:

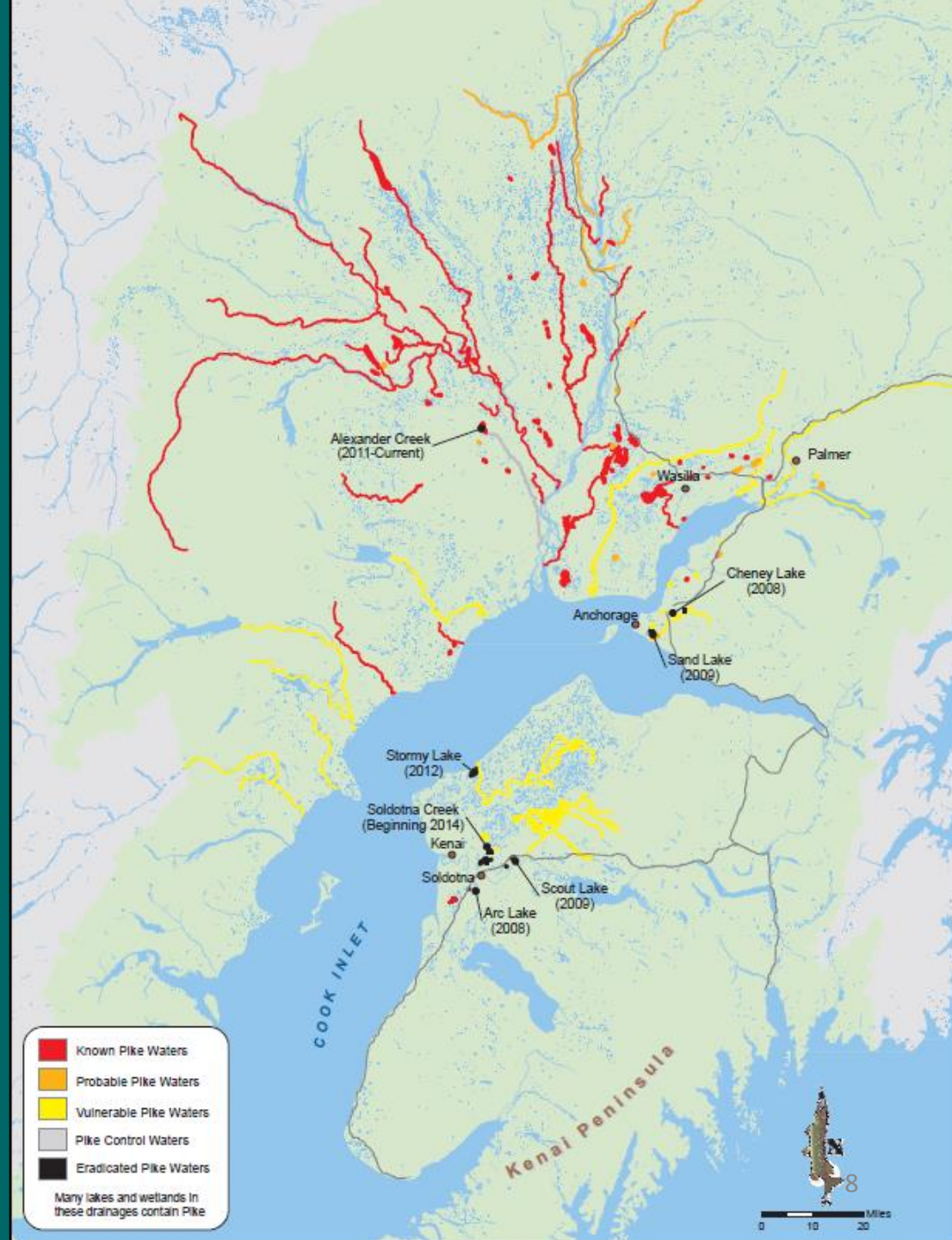
Mat-Su: Alexander Creek

## 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

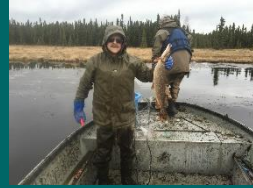
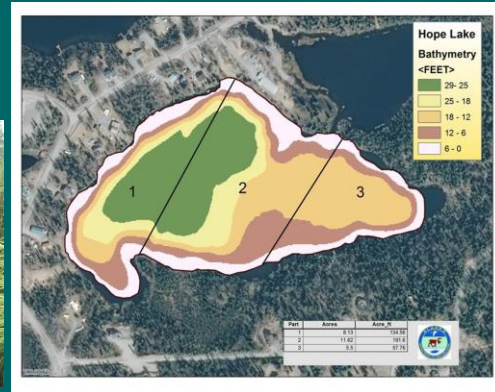
# Rotenone Permitting Process

- 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



**ATTENTION!**

**PESTICIDE  
APPLICATION**

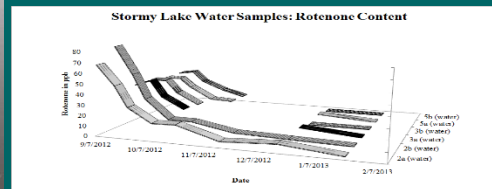
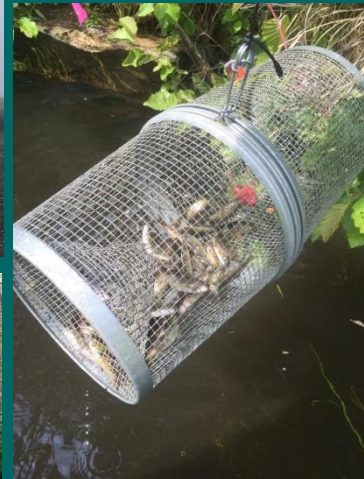
DATE & TIME

**KEEP OUT  
UNTIL**

DATE: \_\_\_\_\_  
TIME: \_\_\_\_\_  
(To be filled out by the applicator only)

MORE INFORMATION AVAILABLE FROM:

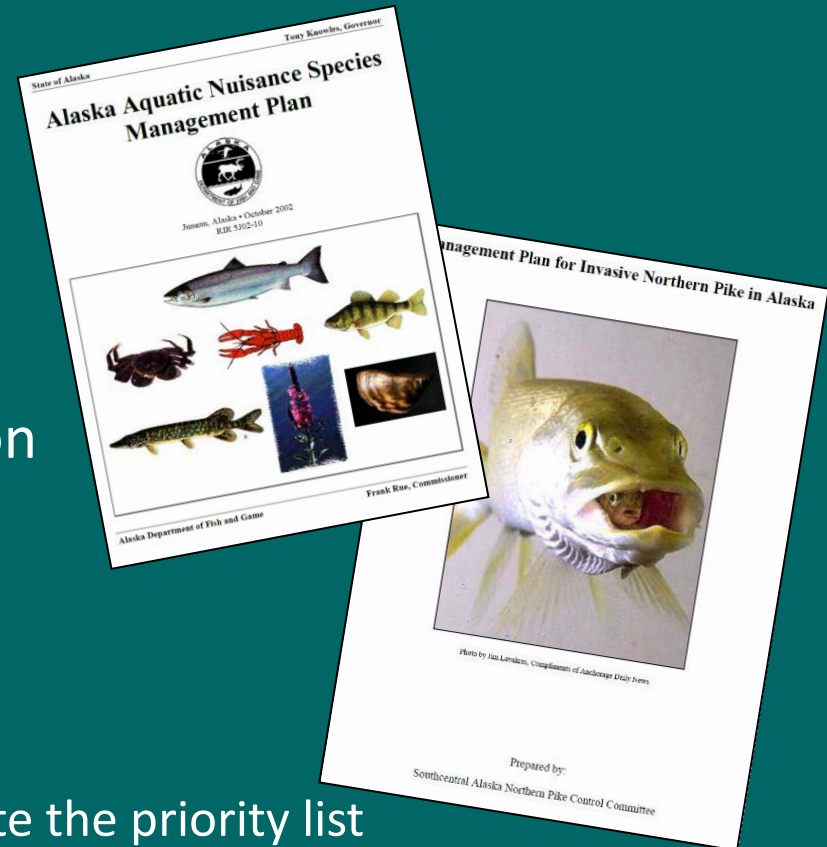
NAME: \_\_\_\_\_  
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# Strategic Planning

## 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**



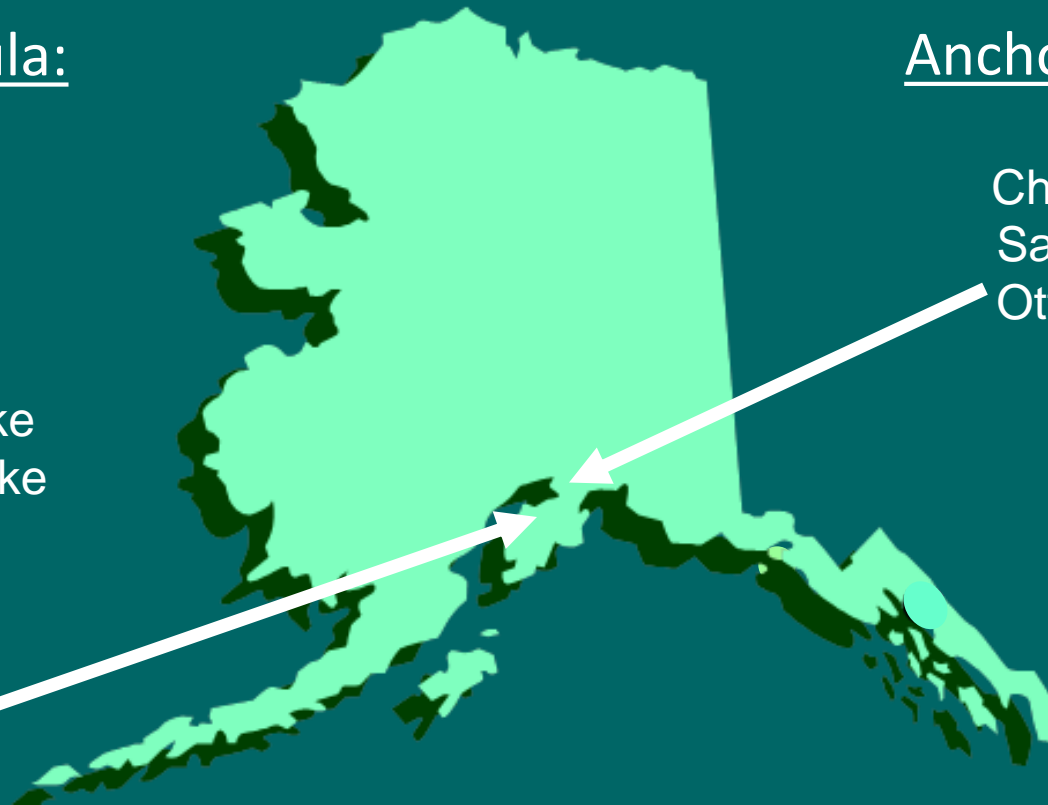
# Rotenone Projects (2008-2017)

## Kenai Peninsula:

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

## Anchorage Area:

Cheney Lake  
Sand Lake  
Otter Lake



All high priority projects to  
prevent pike from spreading

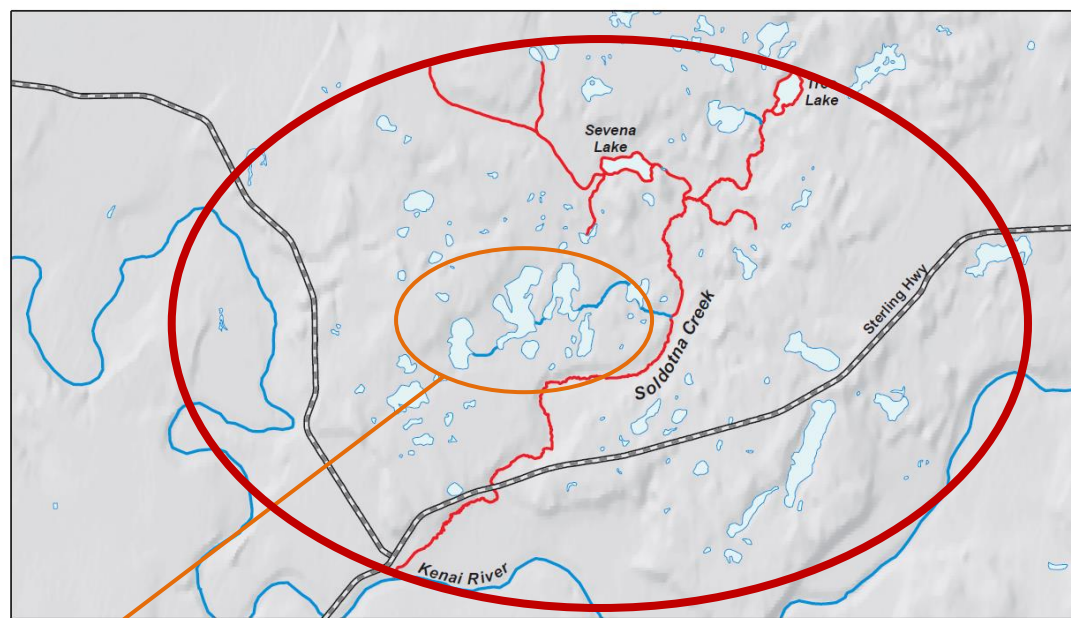
# SOLDOTNA CREEK

## Soldotna Creek Treatment Areas

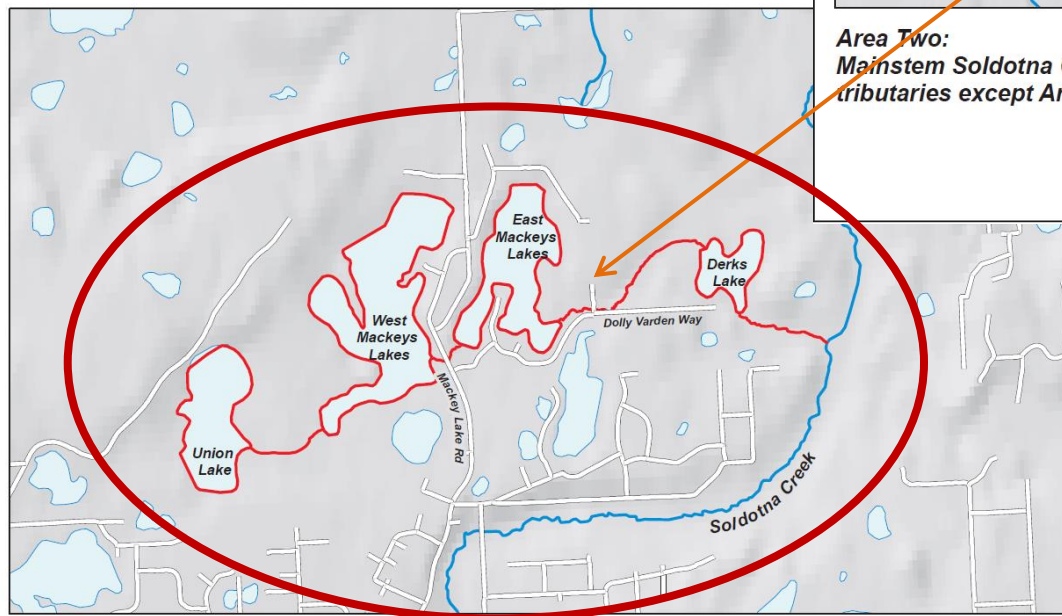
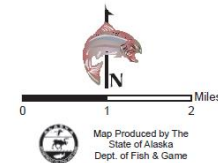
### Area 1

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

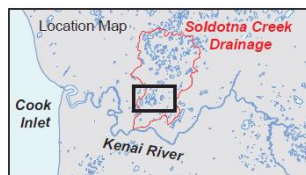
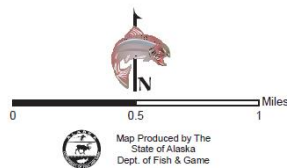
Treatment Timing: 2014



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



**Area One:**  
Western Branch of the  
Soldotna Creek Drainage



### Area 2

Sevena Lake, Tree Lake,  
Mainstem of Soldotna Creek

Treatment Timing: 2016 and 2017

Native Fish Relocation effort from  
Area 2 → Area 1 in 2015





# SOLDOTNA CREEK TREATMENTS



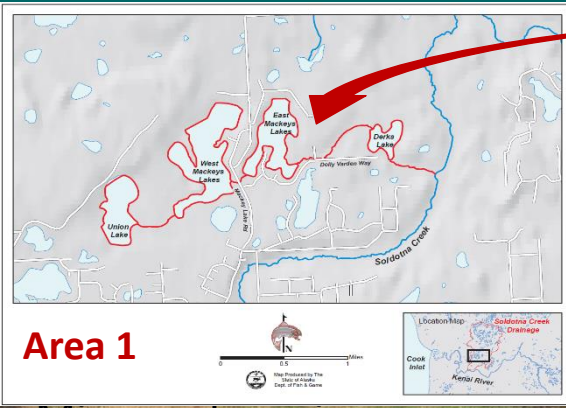


# Post-Treatment Evaluations

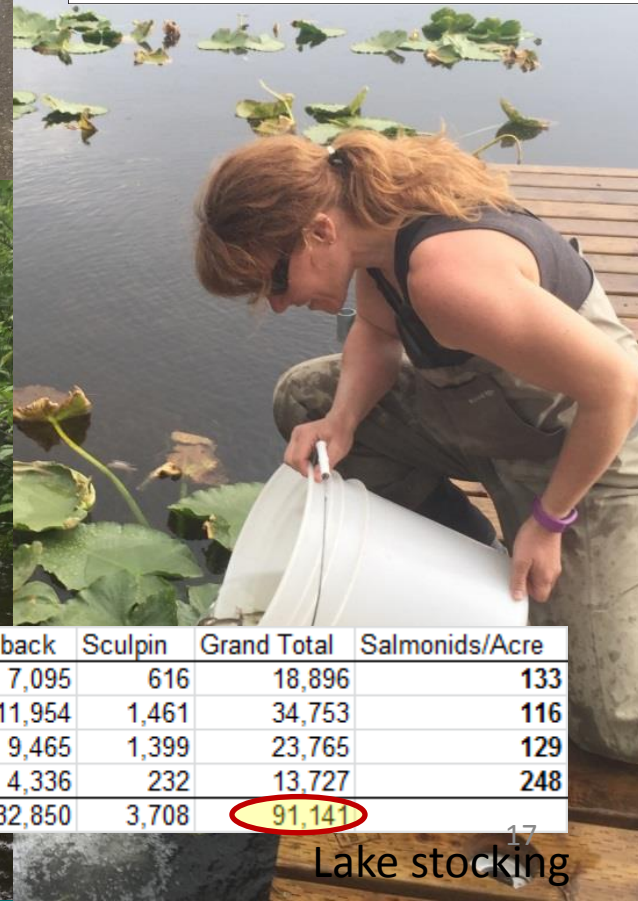
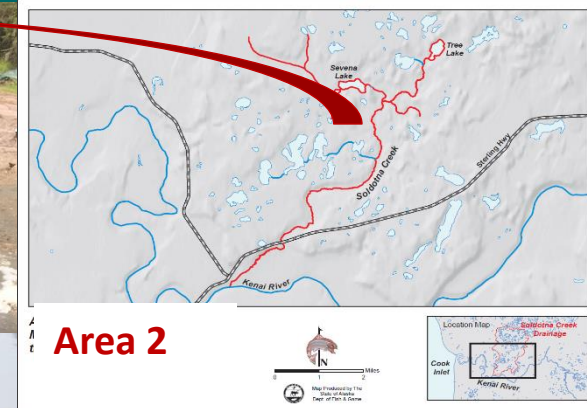




# Native Fish Rescue/Restoration 2015-2017



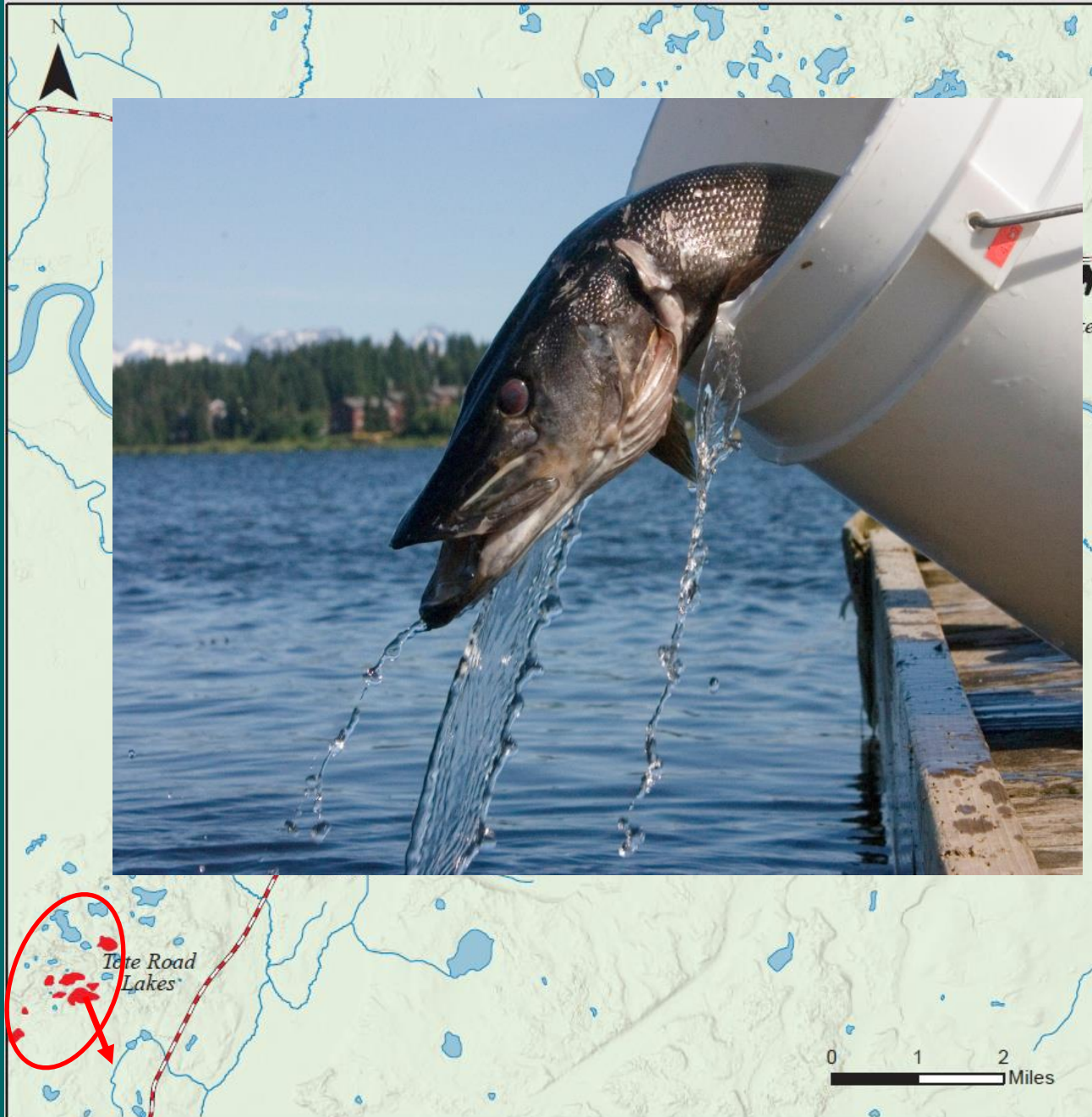
Minnow trapping






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
<b>Totals</b>	<b>405</b>		<b>3,533</b>	<b>4,401</b>	<b>46,649</b>	<b>32,850</b>	<b>3,708</b>	<b>91,141</b>	

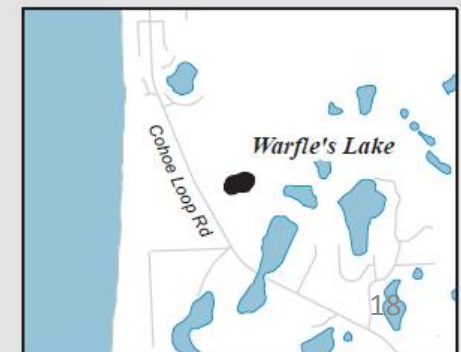


# Current Status of Kenai Peninsula Pike Waters

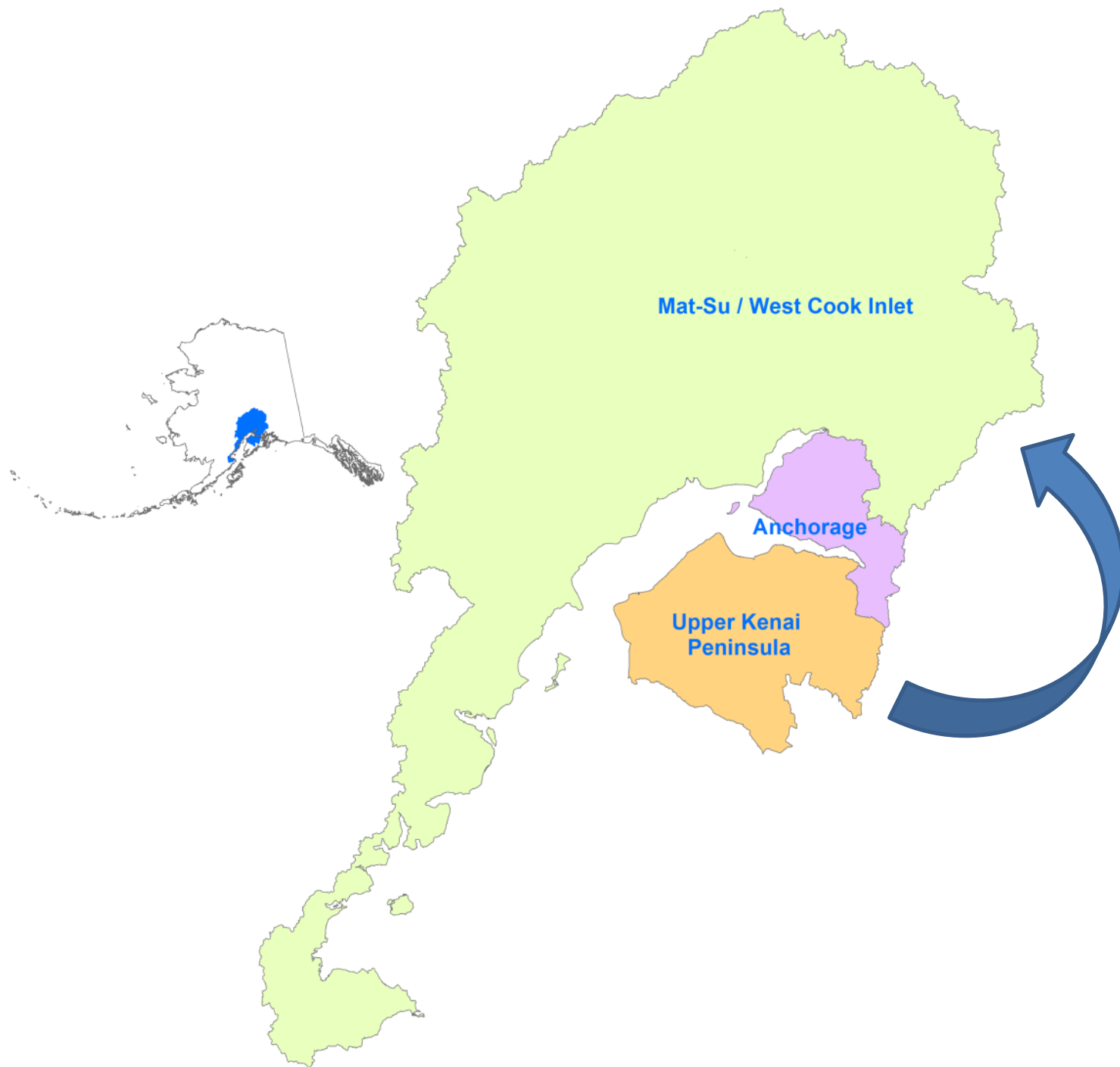


Status of Kenai Peninsula waterbodies where self-sustaining populations of northern pike have occurred

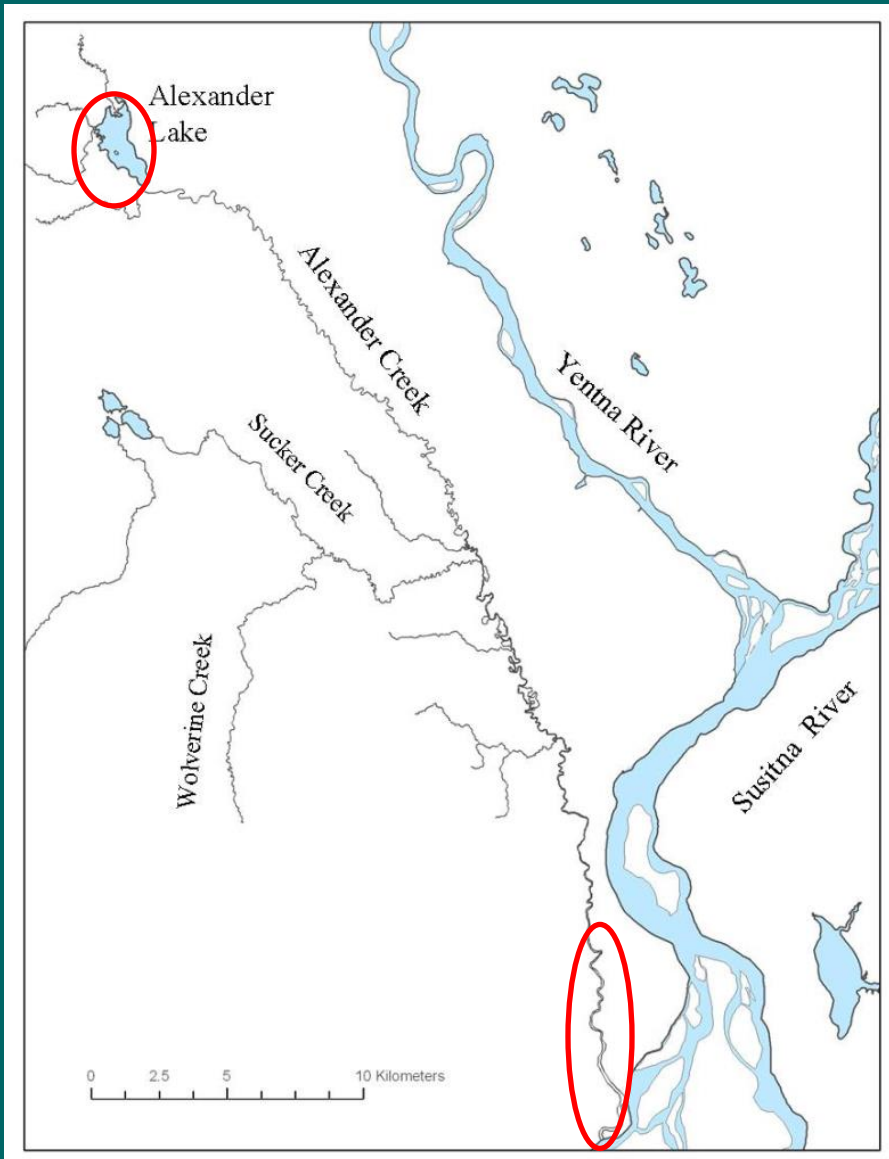
-  Northern pike population remains present
-  Northern pike population eradicated by ADF&G
-  Northern pike population disappeared from an unknown cause



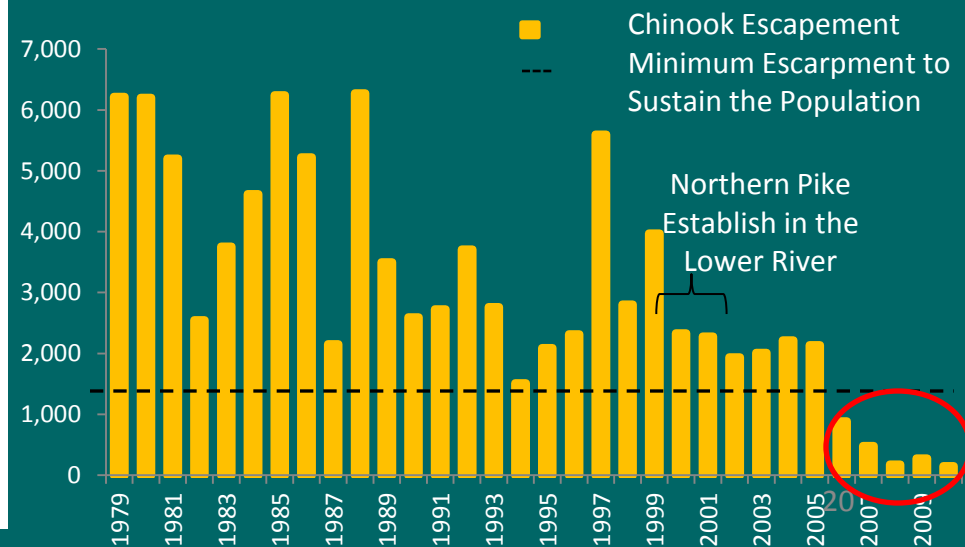




# Alexander Creek Pike Suppression



- 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





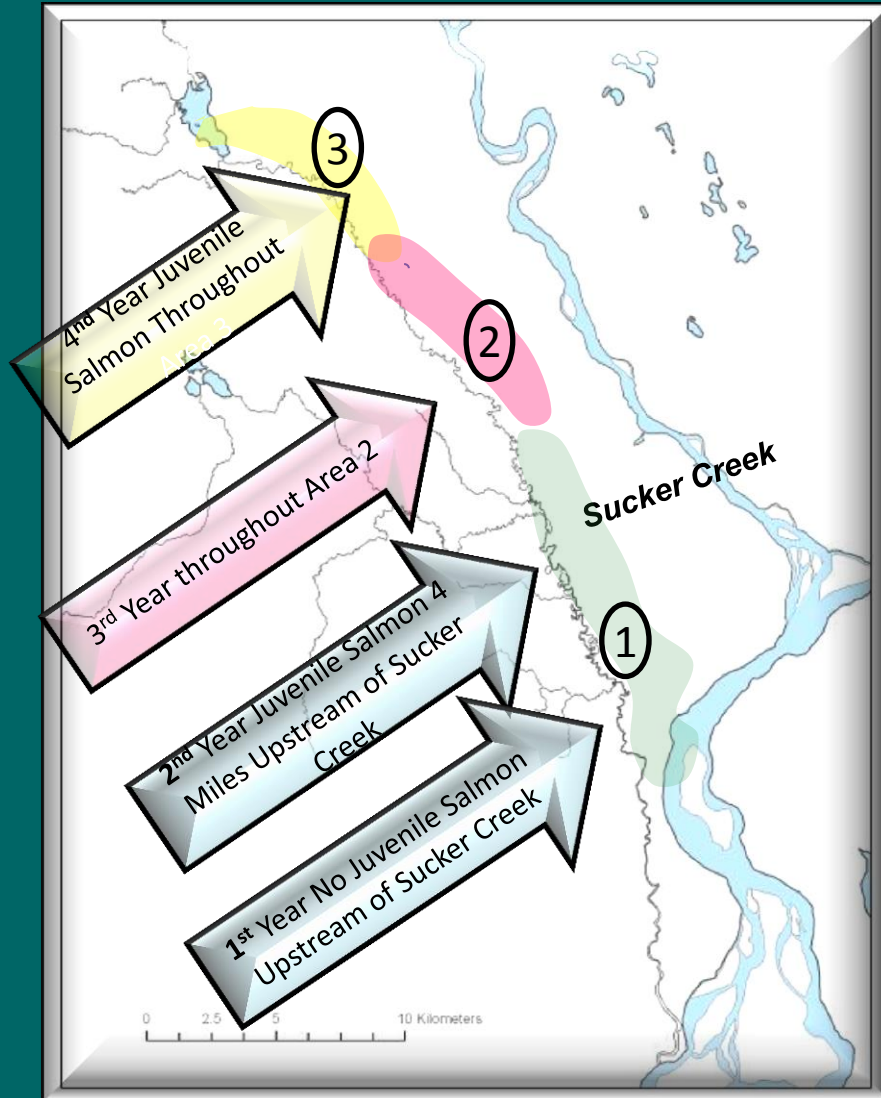
# Alexander Creek Pike Suppression



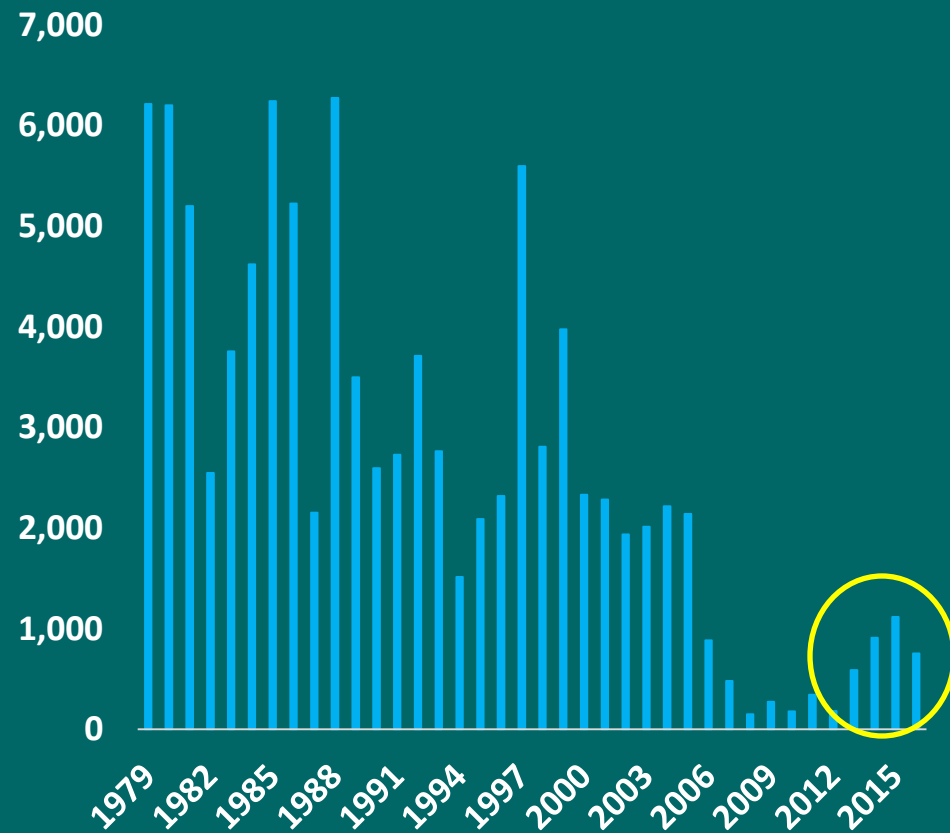
Goal: Drive down pike abundance to allow increased survival of juvenile salmonids

- 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



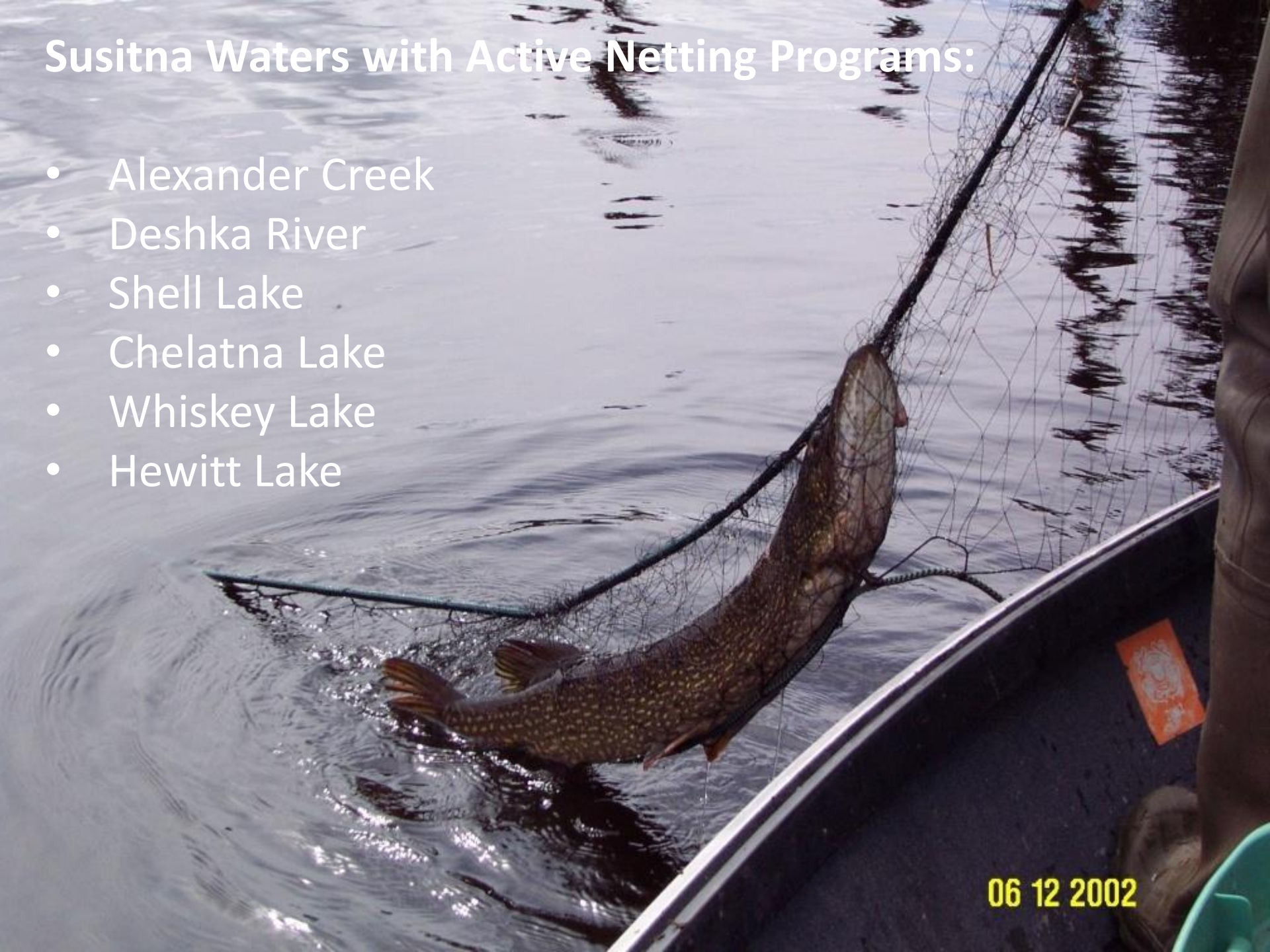
Adult Chinook Salmon Returns





# Susitna Waters with Active Netting Programs:

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



06 12 2002

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

