



BIOSECURITY AND INVASIVE SPECIES INITIATIVE

WEBINAR SERIES

Wednesday, January 16, 2019 at 11 a.m. (MT)

Invasive Species Impacts on Fisheries

MODERATOR

Justin Bush

Executive Coordinator, Washington Invasive Species Council

PANELISTS

Joe

Maroney

Director of
Fishery and
Water Resources,
Kalispel Tribe
of Indians

Laura

Robinson

Program Liaison
Coordinator,
Northwest Power
& Conservation
Council

Parker

Bradley

Invasive Species
Research
Biologist, Alaska
Department of
Fish & Game

History and Current Status of Northern Pike in the Columbia Basin

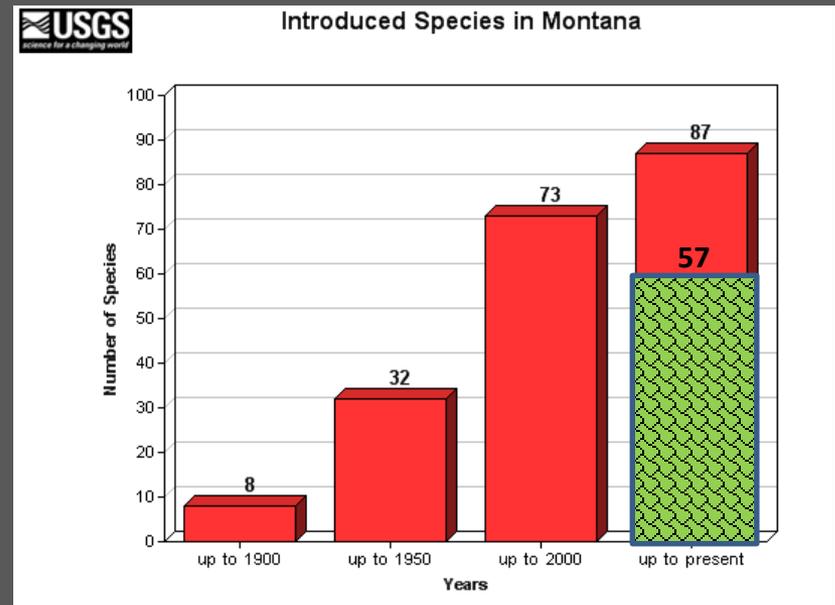
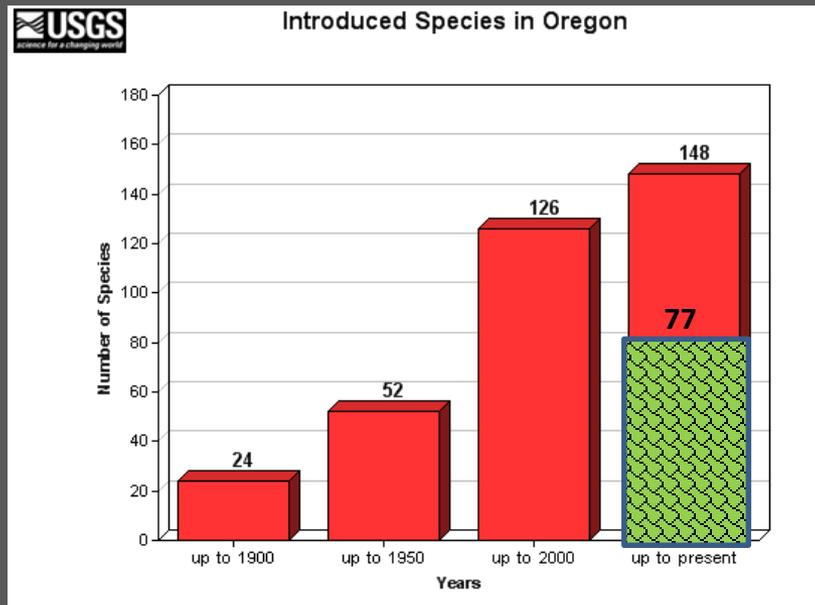
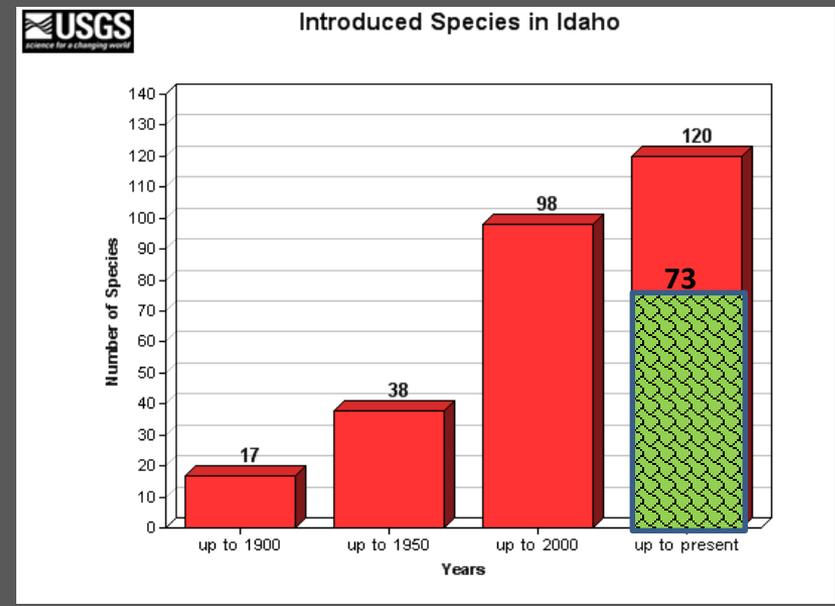
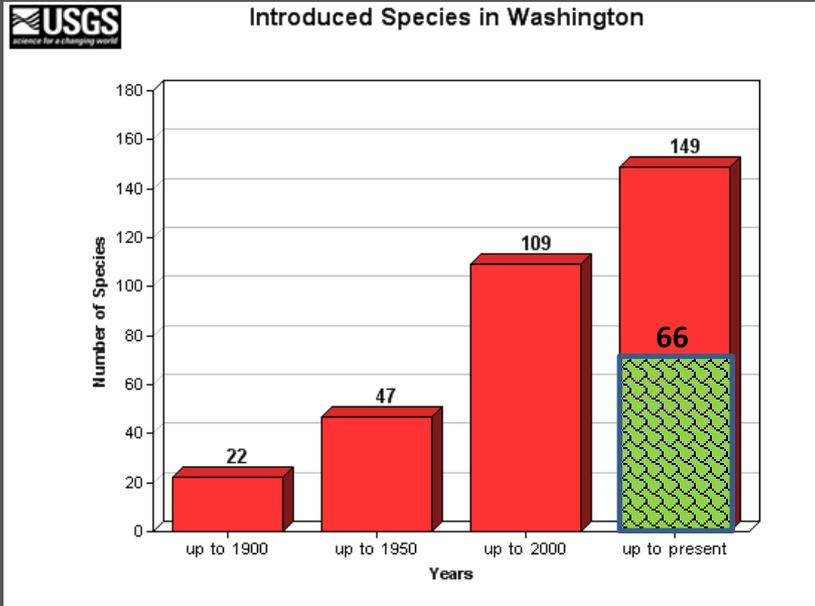
Western Governors' Association Webinar
Invasive Species Impacts on Fisheries



Joe Maroney
Director of Fisheries & Water Resources
Kalispel Natural Resource Department

January 16, 2019

Introduced Species in Pacific Northwest



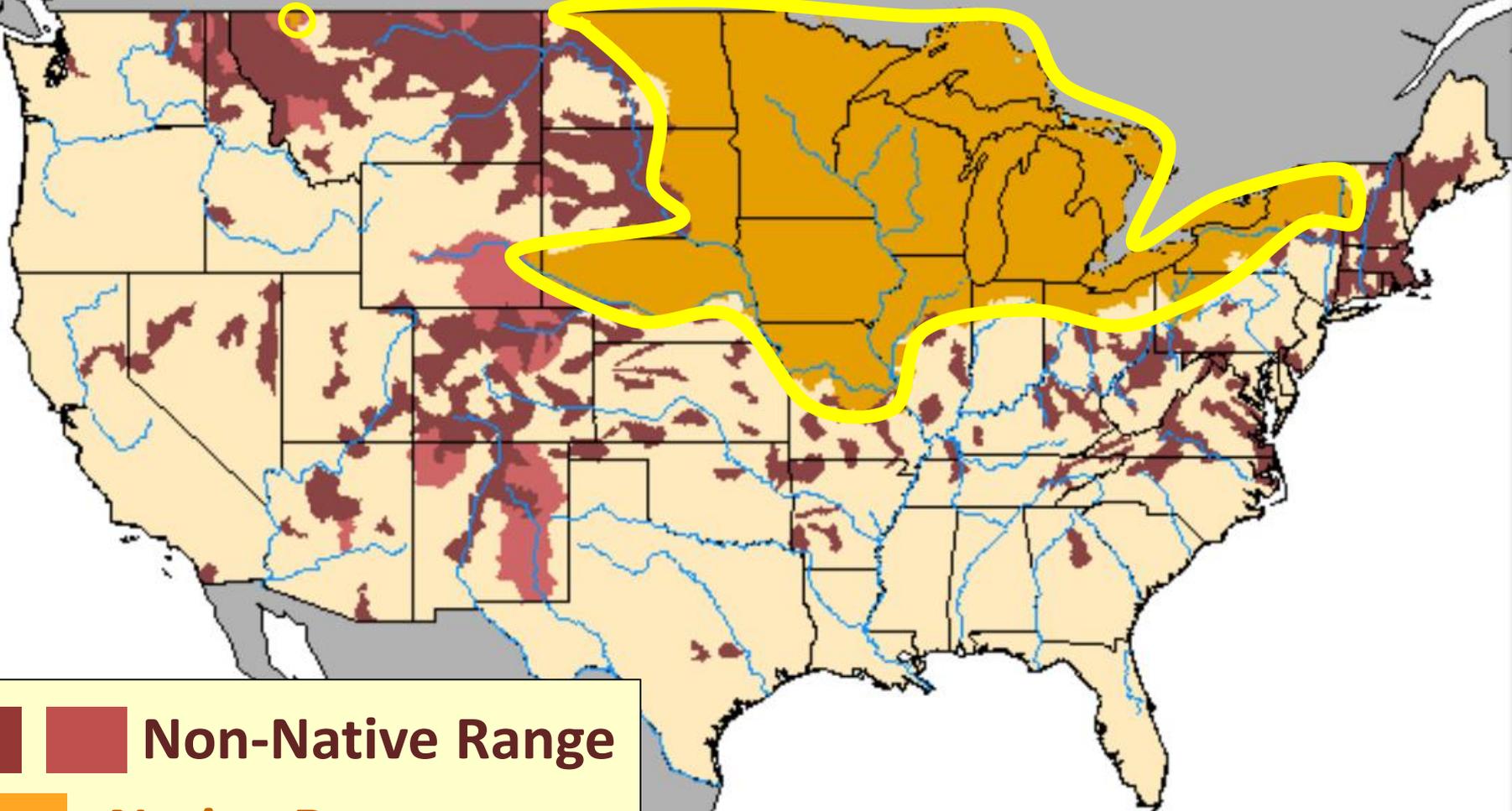
Northern Pike and why are they bad?

- Apex predator
- Highly invasive and can cause large-scale changes in fish communities.
- When introduced, they can significantly reduce prey densities or eliminate entire species
- The species is highly fecund; some females can produce up to 250,000 eggs.
- They can live over 20 years and grow to over 45 pounds.



2008
37.5 lbs
44.5" length

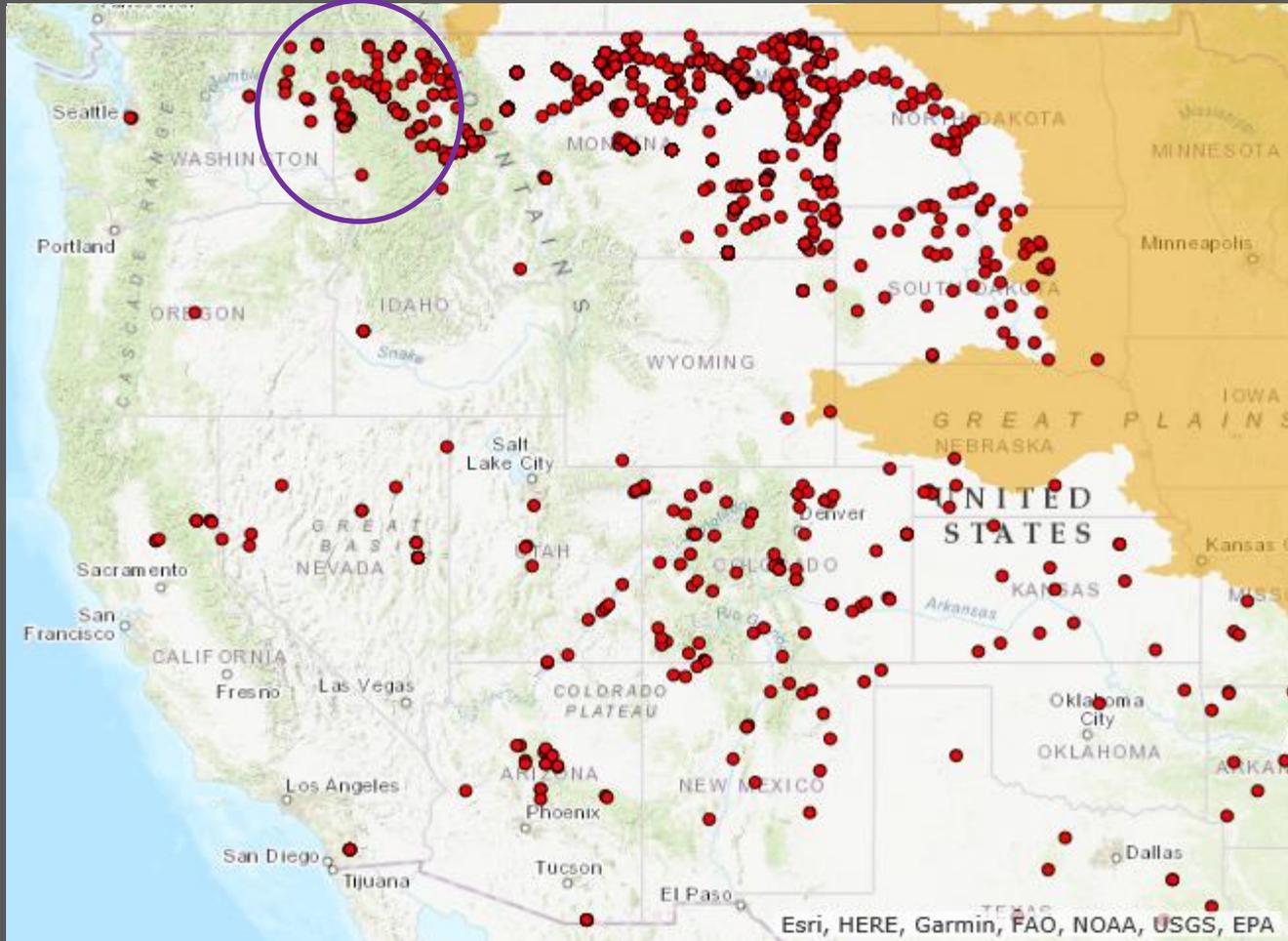
Northern Pike



  **Non-Native Range**
 **Native Range**

Northern Pike Expansion throughout the West

1998

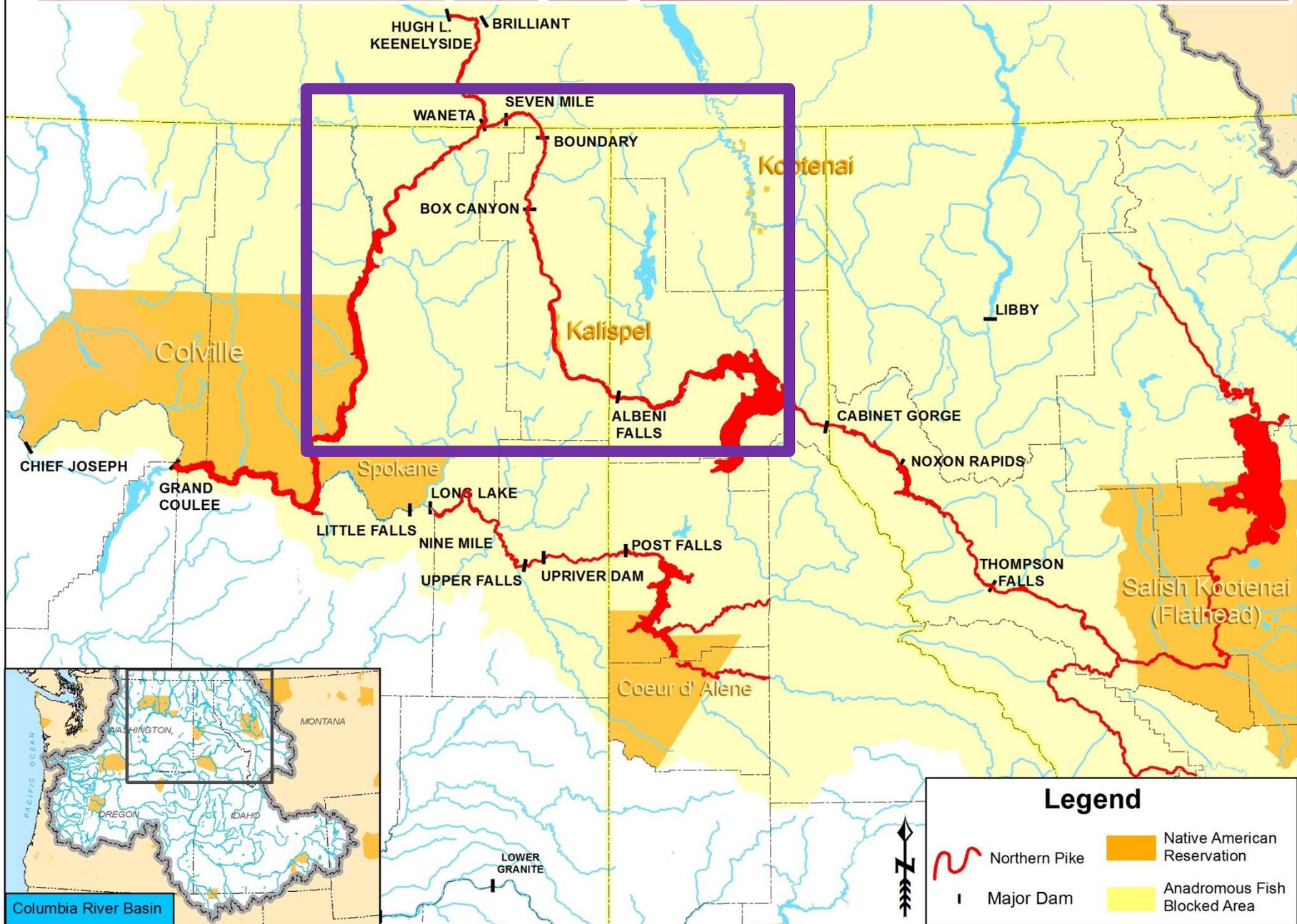


2011

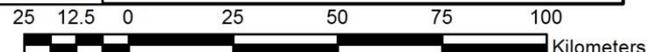
2009

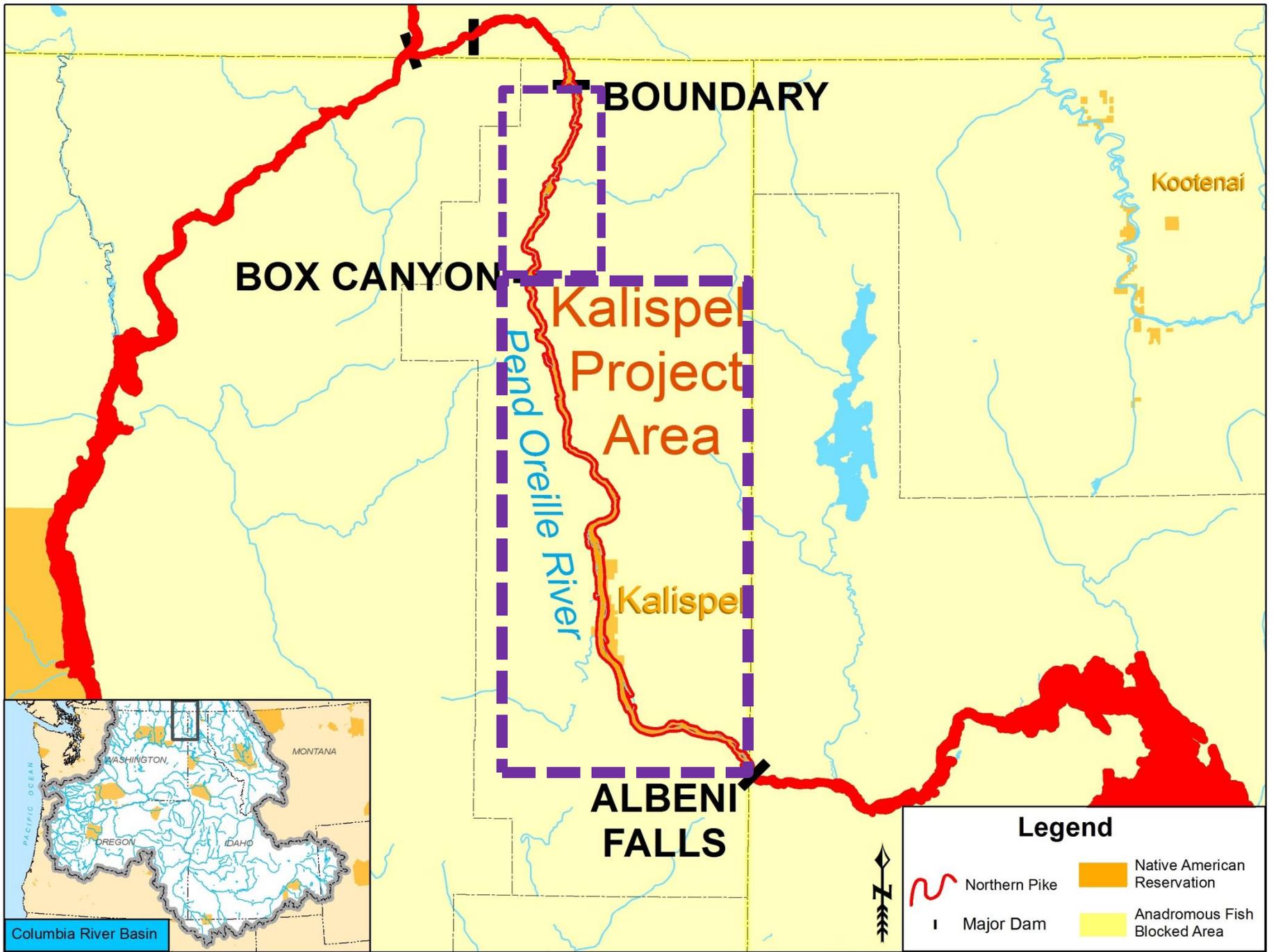
2004

1950's/1970's



Source: Washington State Department of Fish and Wildlife





Source: Washington State Department of Fish and Wildlife

9.5 4.75 0 9.5 19 28.5 38 Kilometers

Kalispel Tribe and Washington Dept. of Fish & Wildlife Thinking

Pike are a problem, not an opportunity

Management goals:

- Minimize impact to native species
- Reduce spread of pike to other waters, including the Columbia River
- Reduce numbers of pike in Box Canyon Reservoir



Invasion/Action Timeline

2004

NP First Detected in Box Canyon Reservoir

2005

NP Studies/Surveys Initiated

2010

1st Annual SPIN Survey in Box Canyon Reservoir

2011

Box Canyon Reservoir Suppression Pilot

Initiate Public Outreach & Regulation Changes

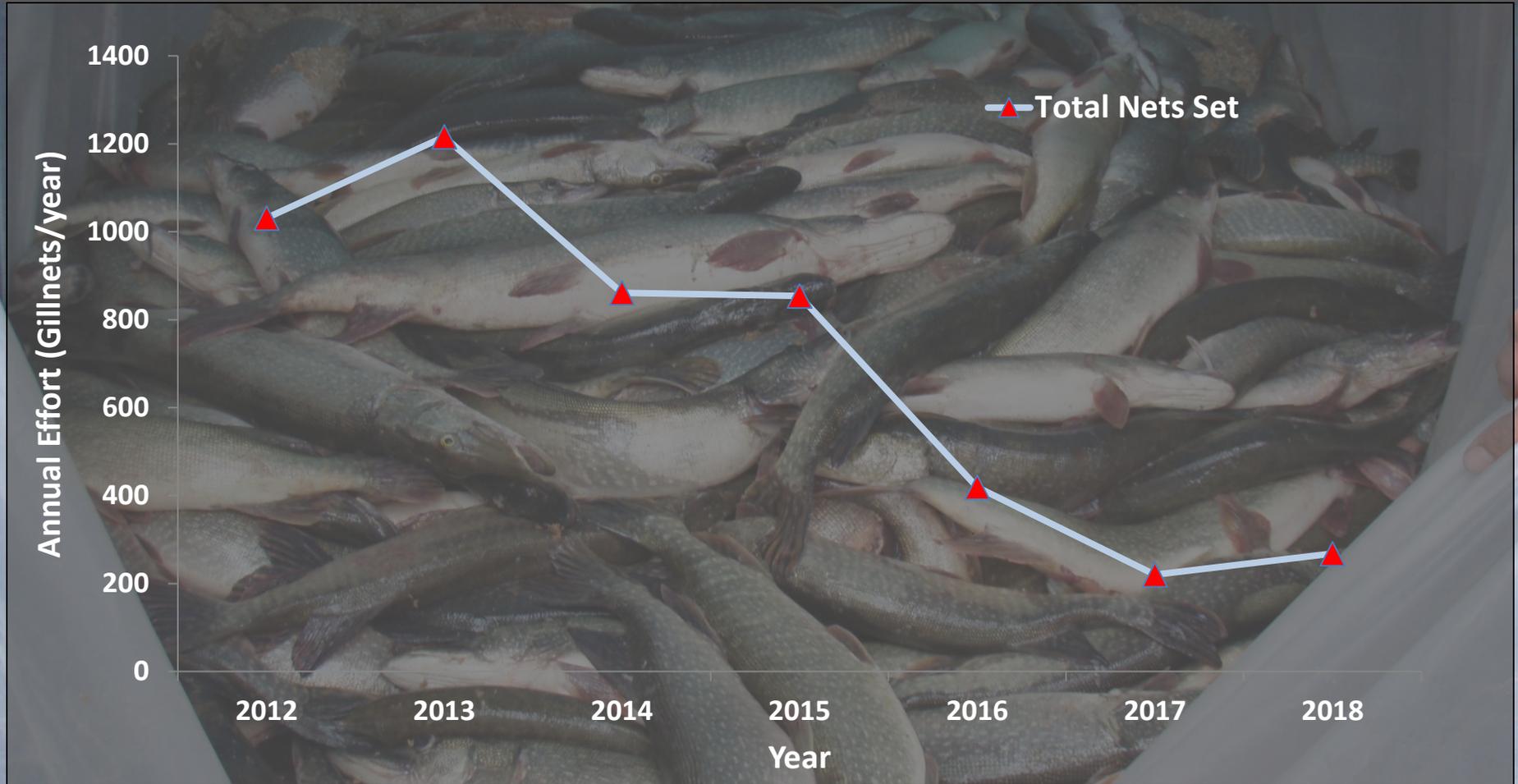
2012

Full Suppression Initiated Box Canyon Reservoir (2012-2018)

2017

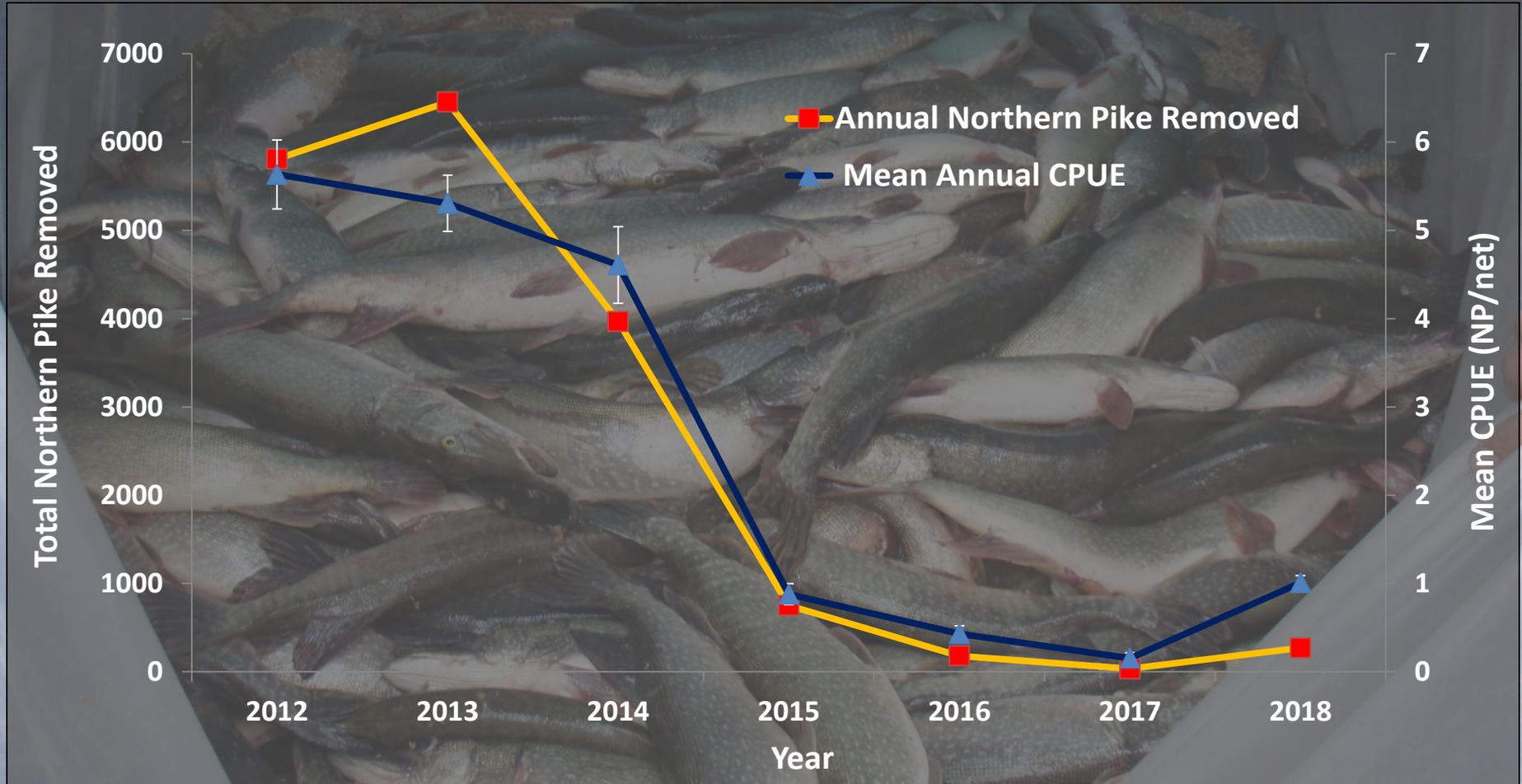
Full Suppression Initiated in Boundary Reservoir (2017-2018)

Box Canyon Suppression 2012 – 2018: Effort



- Set nearly 5,000 gillnets equating to roughly 140 miles of continuous net
- Decline in effort due to decline in overall abundance of Northern Pike

Box Canyon Suppression 2012 – 2018: Results



- Removed nearly 17,500 Northern Pike from Box Canyon Reservoir
- 18.8 metric tons (42,000 lbs) of Northern Pike removed from Box Canyon Reservoir

Program Success to Date



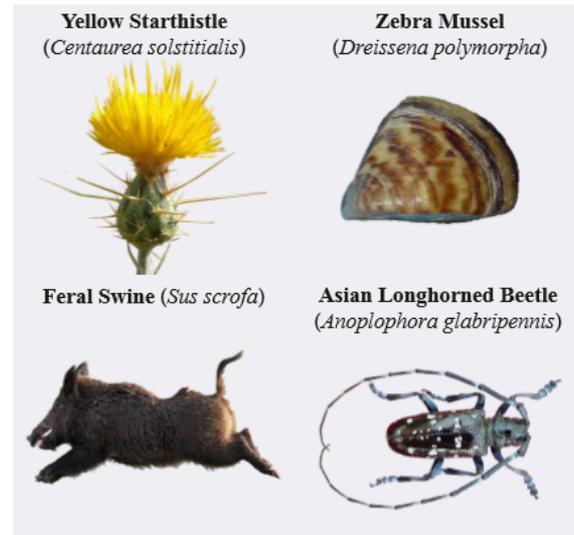
- Removed >17,500 NP
- Reduced (+maintained) relative abundance of NP by >98% in a 89 km long reservoir (Box Canyon)
- Demonstrated the feasibility and effectiveness of this Program in large & complex river system

Washington Invasive Species Council Top Priority Species

Washington Invasive Species Council Top Priority Species

More than 700 invasive species are known to be in and around Washington State, all of which pose a threat to Washington's environment, economy, and human health. Of these known species, the Washington Invasive Species Council has selected 50 priority species for action by the council using science and professional judgment. These species represent the gravest threats to Washington's plants, animals, and businesses that depend on the rich biodiversity of our state.

Terrestrial Plants	Insects	Aquatic Animals	Aquatic Plants	Infectious Diseases	Terrestrial Animals
Butterfly Bush	Apple Maggot	Asian Carp	Brazilian Elodea	Infectious Amphibian Diseases	Feral Swine
Common Crupina	Brown Marmorated Stink Bug	Invasive Crabs	Caulerpa	Infectious Fish Diseases	Mediterranean White Snail
Garlic Mustard	Emerald Ash Borer	Invasive Frogs & Crayfish	Flowering Rush	Chytrid Disease	
Invasive Knapweeds	European Chafer	Invasive Tunicates	Hydrilla	Chytrid Syndrome/Pd	
Invasive Knotweeds	Gypsy Moths	Invasive Zooplankton	Invasive Nodules		
Kudzu	Invasive Longhorned Beetles	New Zealand Mud Snail	Invasive Nodules		
Leafy Spurge	Japanese Beetle	Northern Pike	Phragmites		
Poison Hemlock	Onion Leaf Miner	Northern Snakehead	Purple Loosestrife		
Puncturevine	Scarlet Lily Beetle	Nutria	Spartina		
Rush Skeletonweed	Sirex Woodwasp	Overbite Clam	Starry Stonewort		
Scotch Broom	Spotted Wing Drosophila	Quagga/Zebra Mussels			
Scotch Thistle					
Tamarisk					



Western Governors Association West-wide Invasive Species Risk- Assessment Survey Results: February 2018

Top-10 Established Aquatic Species

1. Eurasian Watermilfoil
2. Quagga and Zebra Mussel
3. New Zealand mudsnail
4. Asian Clam
5. Curly-leaved pondweed
6. Silver Carp
7. Northern Pike
8. Purple loosestrife
9. Hydrilla
10. Whirling disease



Aquatic survey participants: AK, AZ, CA, CO, HI, MT, ND, NE, NM, NV, OK, OR, SD, TX, UT, WA, WY

Increased Awareness of Northern Pike



1:00 - 1:30 **NORTHERN PIKE, AN UNWELCOME INVADER**

Keynote

- **Kristin Dunker and Parker Bradley**, Alaska Department of Fish and Game



September 10, 2018

2018 - 2019 PNWER Executive Committee*

Larry Duke, M.L.A.
Saskatchewan
President

Rep. Mike Cuffs
Montana
Vice President

Graham Sucha, M.L.A.
Alberta
Vice President

Rep. Gael Tarleton
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Vice President

Hon. Bob McLeod
Northwest Territories
Vice President

Sen. Chuck Winder
Idaho

Rep. Bryce Edgmon
Alaska

Rick Ghmac, M.L.A.
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Hon. Raup Pillai
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Colin Smith
APEGBC
Private Sector Co-Chair

Don Kirschner
Northwest Gas Assoc.
Private Sector Co-Chair

Sen. Amie Roblan
Oregon
Imm. Past President

*Partial listing

Guy Norman
Council Member
Northwest Power & Conservation Council
851 SW 6th Ave.
Portland, OR 97204

RE: Need and Potential for Invasive Species Economic Analyses

Dear Council Member Norman,

I am writing to express support for the Northwest Power and Conservation Council's investigation into developing additional economic reviews and analyses focusing on emerging invasive species issues, such as the proliferation of northern pike within the Columbia River Basin.

The Pacific NorthWest Economic Region (PNWER) and our Invasive Species working group has worked extensively on protecting the region against the threat of invasive species. At this year's PNWER Summit in Spokane, our Invasive Species working group held a special working session on northern pike with stakeholders and experts from around the region. As a result of the meeting, the Invasive Species working group submitted an action item that was approved by the PNWER Executive Committee that PNWER send a letter to the Northwest Power and Conservation Council "regarding the need and potential for additional economic analyses of invasive species to be developed."

Protecting our region against the significant environmental and economic risk of invasive species has long been recognized by PNWER and our Executive Committee of legislators as one of the key issues for our region. Every year we advocate and inform policy makers at the state, provincial, territorial, and federal levels on the issue of invasive species.

The states and provinces of our region face numerous threats from invasive species. PNWER recognizes the damaging impact that northern pike can have on our regional ecosystem and economy, and are particularly concerned with the potential impacts to salmon in the Columbia Basin. PNWER recognizes the need for, and sees significant value added in the development of additional economic analyses to aid decision making and support of rapid response activities. We recommend that the Council investigate the potential economic impacts of invasive species on the regional economy.

Sincerely,

Matt Morrison
Chief Executive Officer

INTERAGENCY FORUM

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ghts, WA
loor)

Pacific Northwest Northern Pike Forum and Coordination Meeting Report

July 24th, 2018 1:00-4:00 pm
Meeting Room 10, Davenport Grand Hotel, Spokane, WA
*Meeting report developed by Samara Group, LLC
on behalf of the Pacific NorthWest Economic Region*

Introduction

Northern pike threaten the Pacific Northwest's economy and environment. Over 50 individuals representing Native American Tribes, First Nations, federal government agencies, regional organizations, state and provincial agencies, academic institutions, and non-governmental organizations were in attendance at this forum and coordination meeting on July 24th, 2018 coordinated by the Pacific NorthWest Economic Region (PNWER) and Washington State Invasive Species Council. The purpose of the meeting was to share regional perspectives about Northern pike; identify a path for continuation of a cross-border committee focusing on Northern pike; and define feasibility and needs for publication of a regional economic analysis. Northern Pike could affect Tribal, commercial, and recreational sport fishing industries, pose as a risk to threatened and endangered species, and pose as a risk to hydroelectric operating licenses and regional power rates.

Agenda

The screenshot shows the Northwest Power and Conservation Council website. The main article is titled "The Pike Problem" by John Harrison, dated September 2018. The article's sub-headline is "Invasive species threatens fisheries in Washington | Showing a runaway species". Below the text is a photograph of a person wearing yellow gloves holding a large northern pike. The article is part of a report titled "Invasive species threatens fisheries in Washington".

Northern pike caught in Lake Washington could have impact on juvenile salmon

Originally published January 27, 2017 at 3:21 pm | Updated January 28, 2017 at 1:11 am

The Seattle Times



Photo of Northern Pike caught in Lake Washington on Jan. 24 was taken by Brian Noel.

Acknowledgements

- Bonneville Power Administration
- US Bureau of Indian Affairs
- Avista Corporation
- Seattle City Light
- Eastern Washington University
- Washington Department of Fish and Wildlife
- Kalispel Tribe of Indians
- Hardworking KNRD Field Crew



Thank You! Questions?



More Information:

Websites: http://wdfw.wa.gov/ais/esox_lucius/

and <http://kalispeltribe.com/kalispel-natural-resources-department/>



Developing a coordinated, regional strategy for Northern Pike in the Columbia

Laura Robinson

Northwest Power and Conservation Council

lrobinson@nwcouncil.org

2014 Fish and Wildlife Program

- **Non-native and Invasive Species Strategy:**

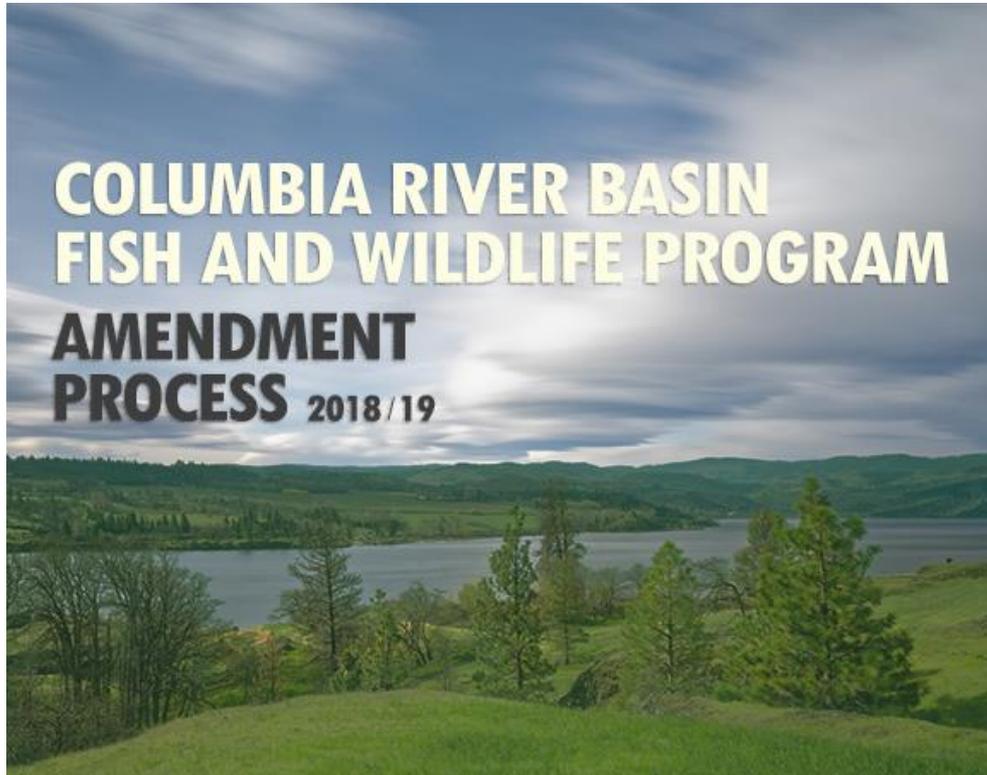
Prevent the introduction of non-native and invasive species in the Columbia River Basin, and suppress or eradicate non-native and invasive species.

- **Predator Management Strategy:**

Improve the survival of salmon and steelhead and other native focal fish species by managing and controlling predation rates.

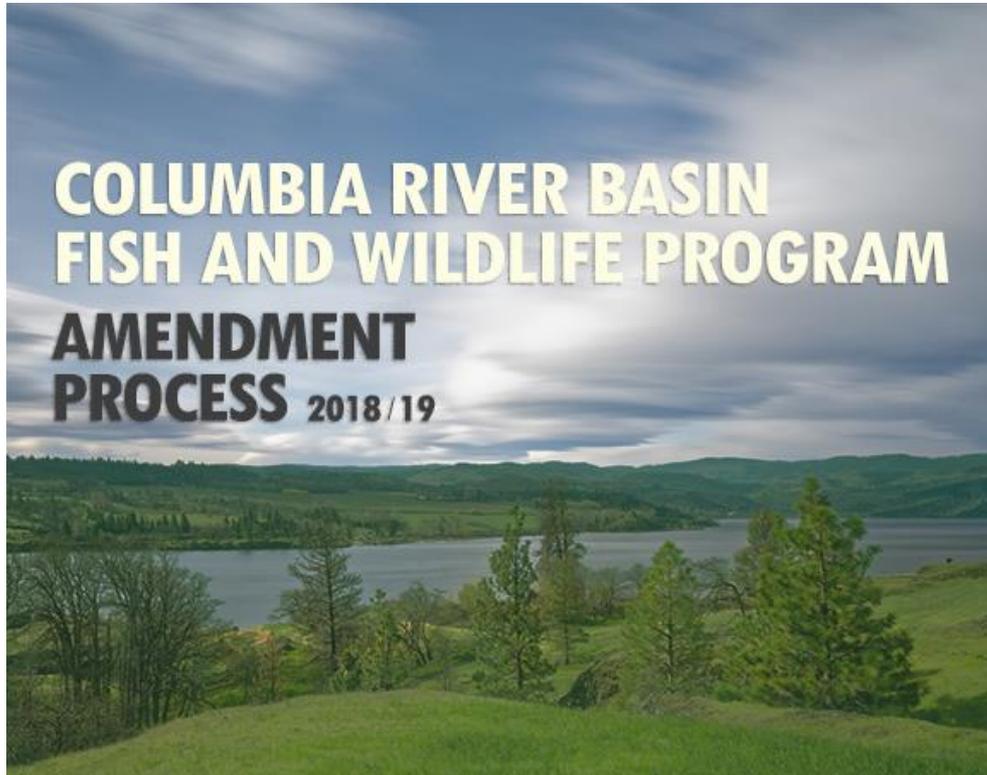


Current Program amendment process



- Recommendations received from fish and wildlife managers
- Now: public comment period on the recommendations
 - Submit comments here: nwcouncil.org/fw/program/2018-amendments

Current Program amendment process



- What we're hearing
 - Support a regional strategy
 - Conduct economic reviews
 - Fund suppression work
 - Develop a common metric

Science and economic review

- July PNWER Pacific Northwest Northern Pike Forum and Coordination Meeting
- Letters of support received from:
 - Pacific Northwest Economics Region (PNWER)
 - Washington Governors Salmon Recovery Office and Washington Invasive Species Council
 - Oregon Invasive Species Council
- Science and economic review is underway
- Should receive review from the Independent Scientific Advisory Board and economists in May/June



Photo credit: Confederated Tribes of the Colville Reservation

Fish and Wildlife Program projects



Photo credit: Confederated Tribes of the Colville Reservation

- Lake Roosevelt Fisheries Evaluation Program
- Northern Pike Suppression and Monitoring

What's next?

- Receive the science and economic review
- Amend the Fish and Wildlife Program
- Continue to support regional coordination on this issue



Photo credit: Confederated Tribes of the Colville Reservation and Spokane Tribe of Indians

Impacts of Invasive Northern Pike in the Susitna River Drainage



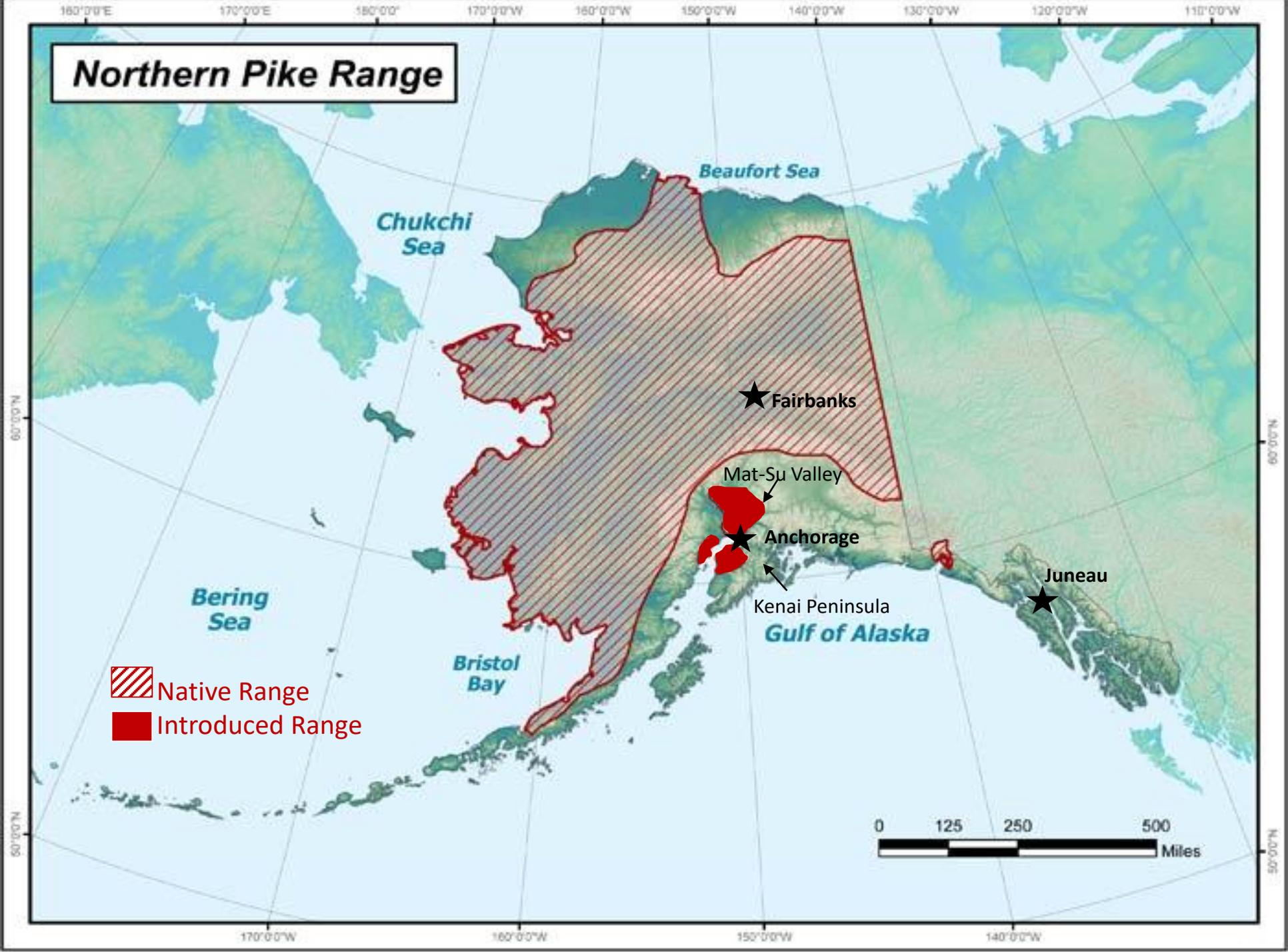
Parker Bradley

Alaska Department of Fish and Game

Sport Fish Division

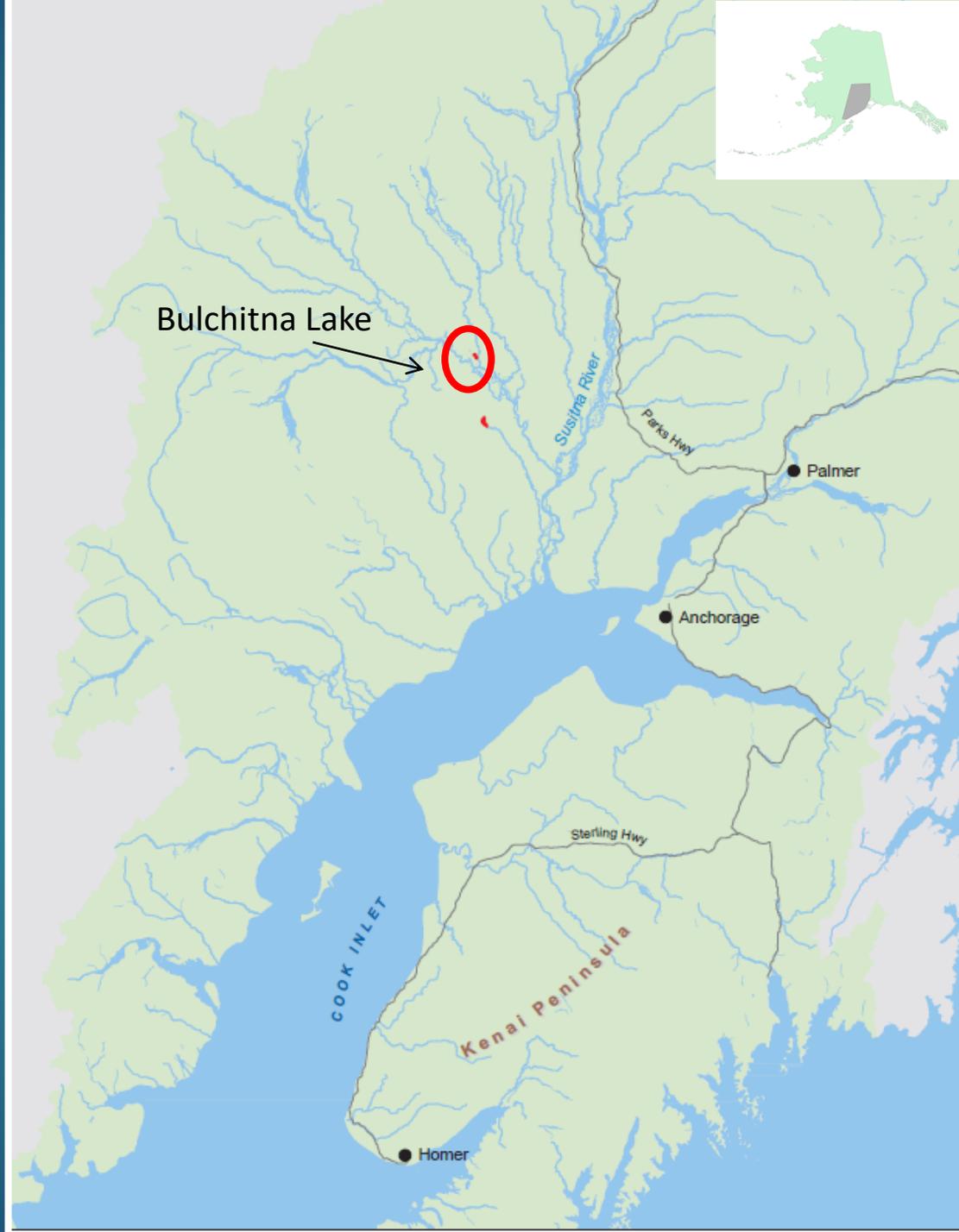


Northern Pike Range



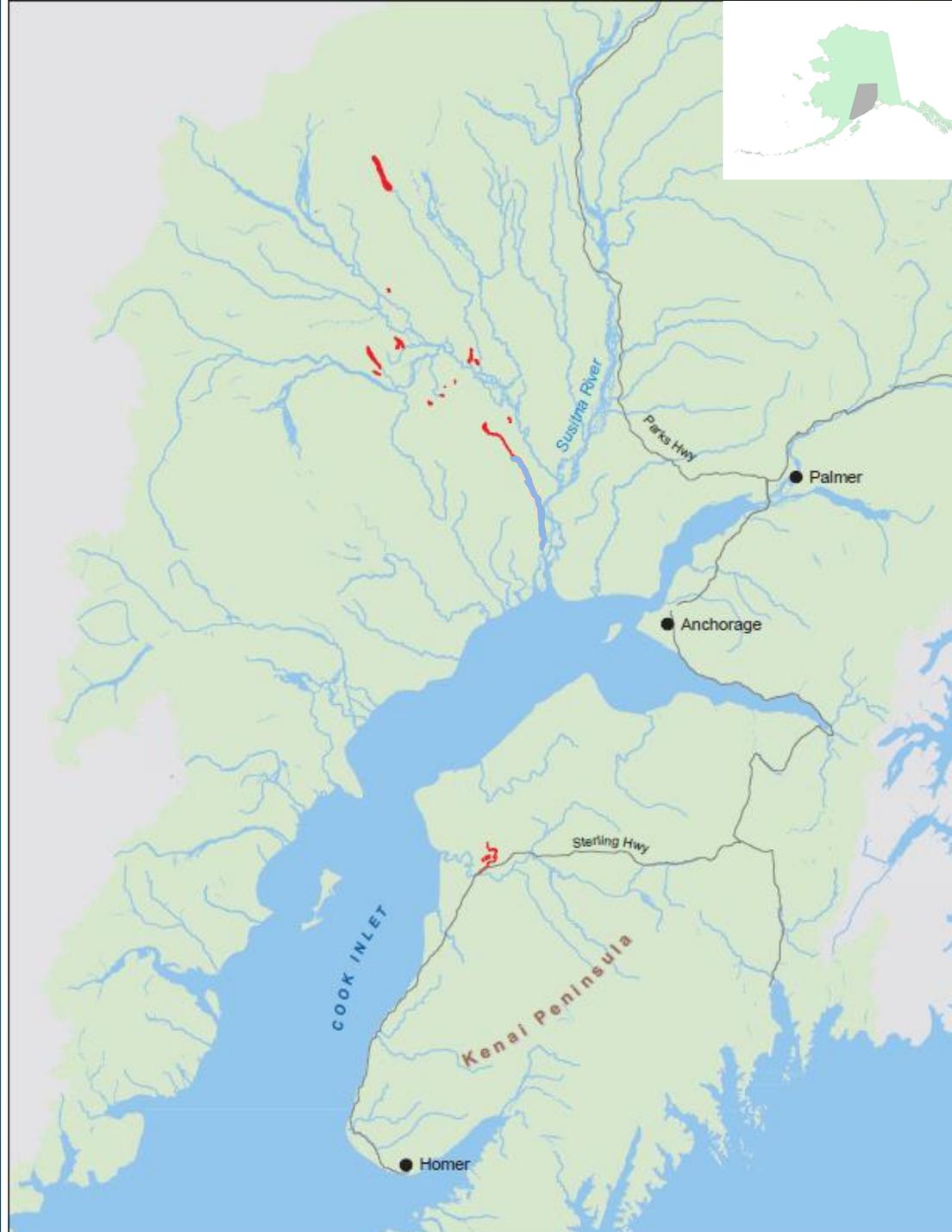
Northern Pike Dispersal in Southcentral Alaska

1950s – 1960s



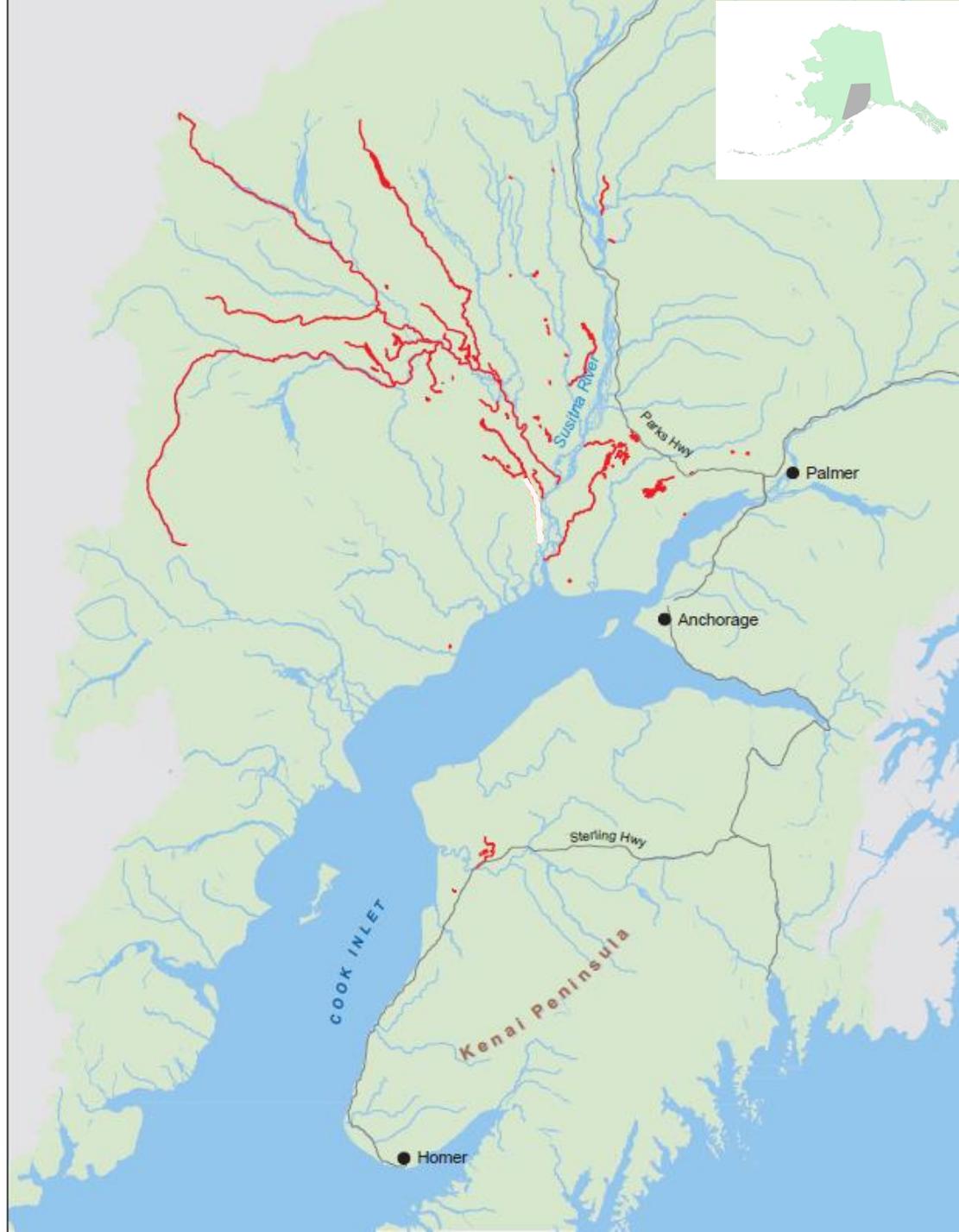
Northern Pike Dispersal in Southcentral Alaska

1970s



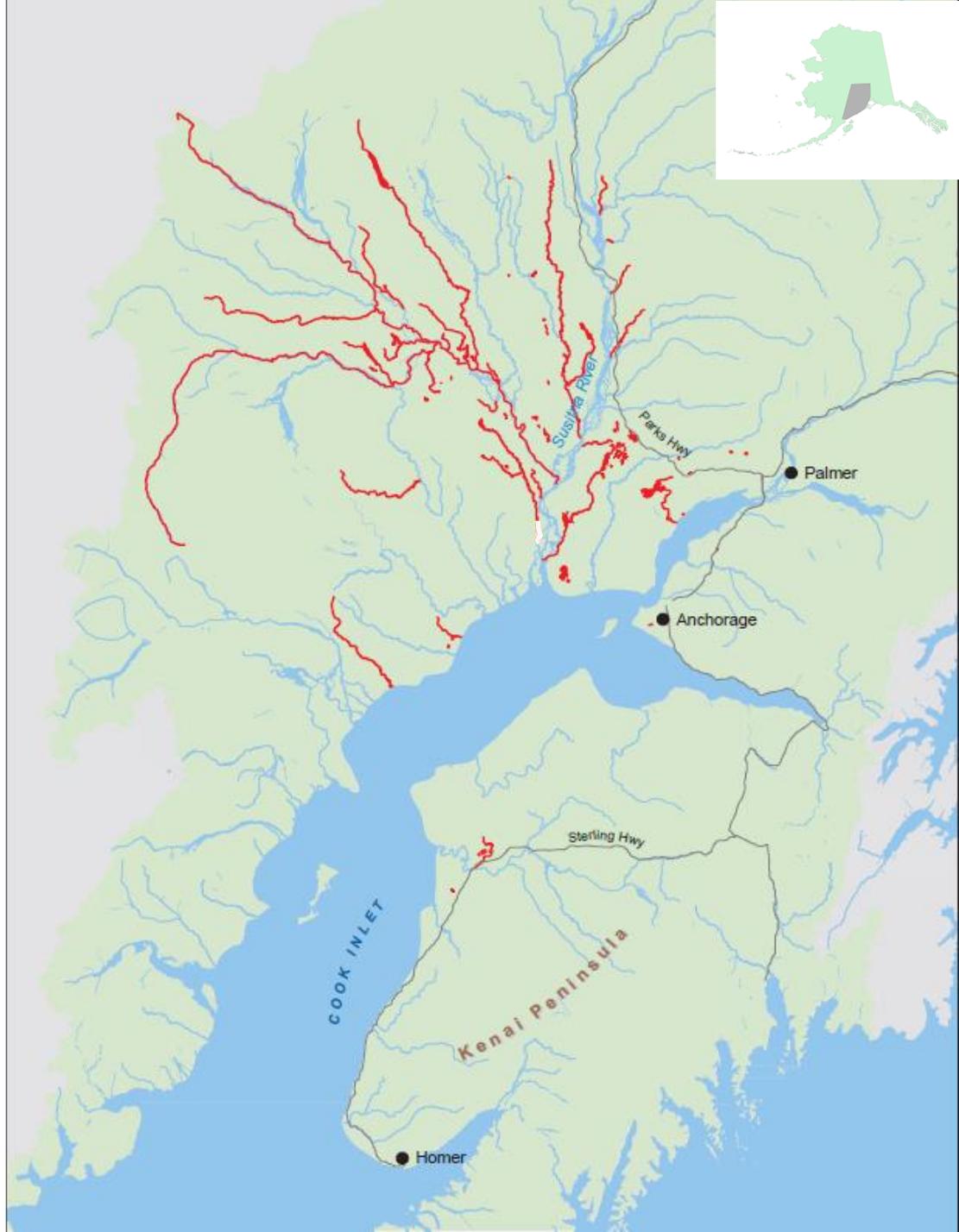
Northern Pike Dispersal in Southcentral Alaska

1980s



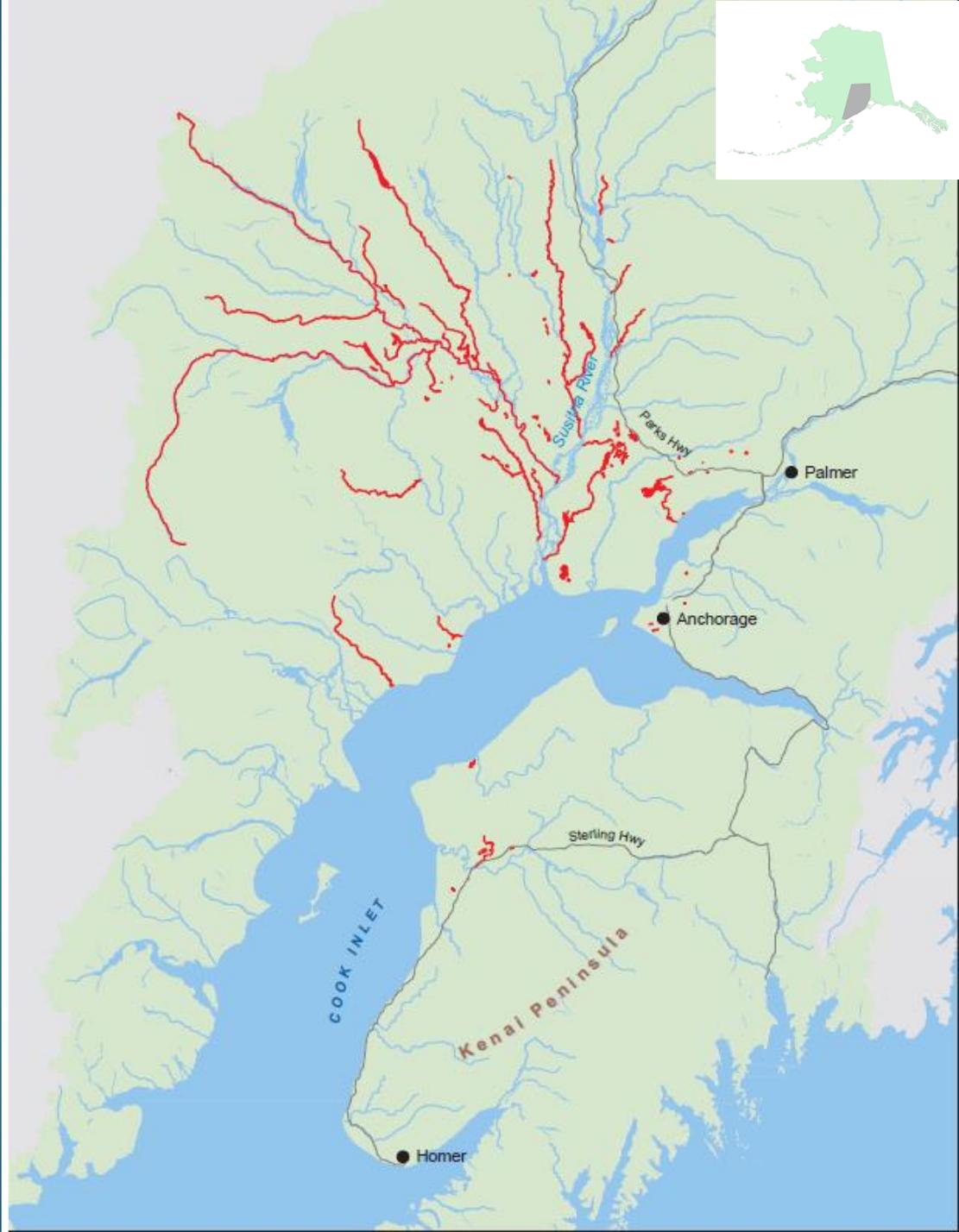
Northern Pike Dispersal in Southcentral Alaska

1990s



Northern Pike Dispersal in Southcentral Alaska

2000s

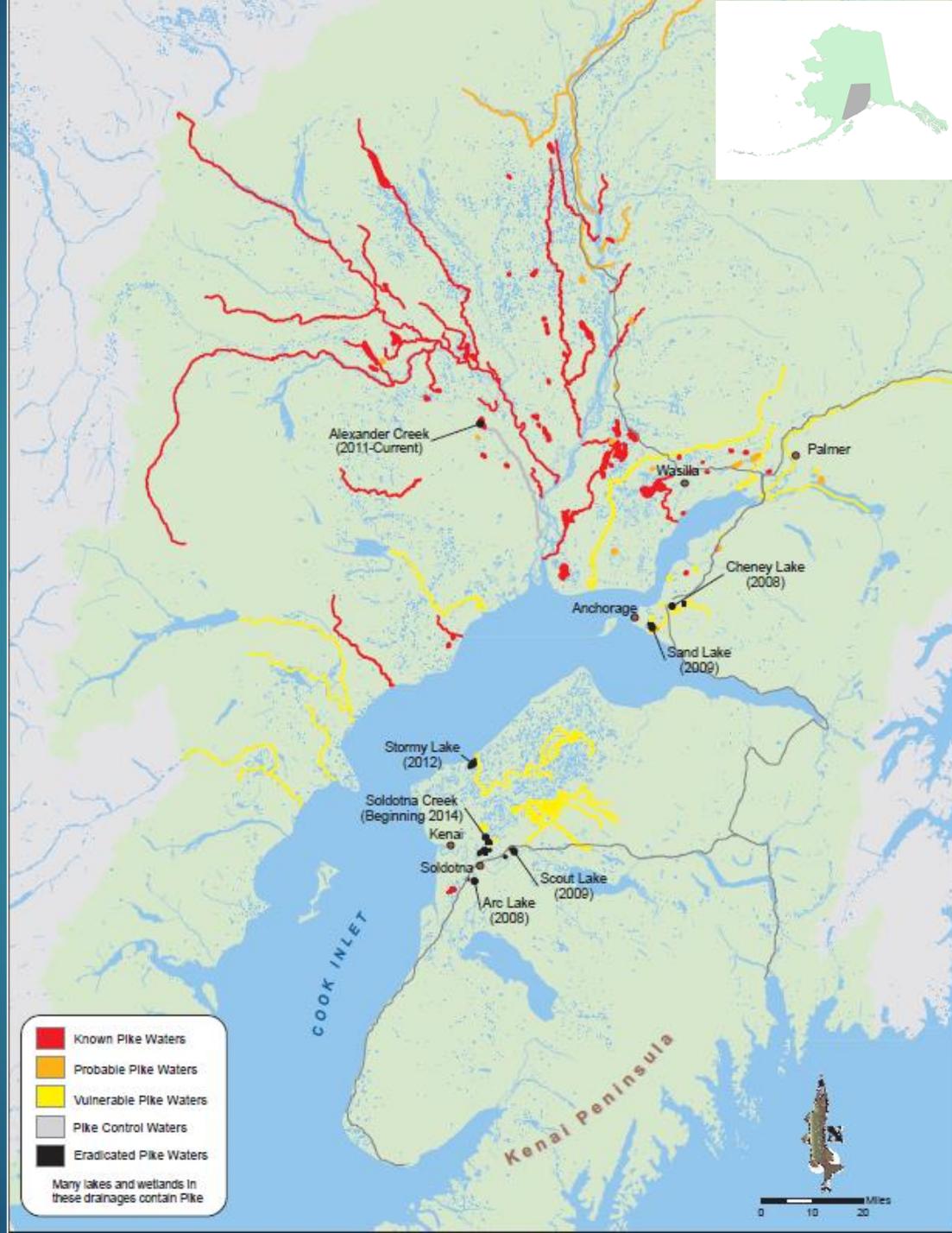


Northern Pike Dispersal in Southcentral Alaska

Today

> 100 water bodies
with invasive pike

Pike are an invasive
species in these waters



Ecological Effects

- Heavy predation on juvenile salmon and trout
 - Extirpated in some areas
- Evidence that pike target salmon



Pike →

~~Salmonids~~ → ~~Sticklebacks/Sculpins, etc.~~ → Invertebrates →

Pike Population Stunts

Alexander Creek Case Study

- Alexander Creek is Remote in Nature
- 26 Air Miles NW of Anchorage
- 1st In a Series of Major Tributaries to The Susitna River
- Alexander Lake is 880 Surface Acres
- Mainstem is approximately 50 River miles
- Historically a large Chinook salmon producer
- Pike introduced into Alexander Lake in mid 1960's
- Discovered in lower Alexander Creek in 1990's



Alexander Creek Case Study

- Pike should be considered a significant threat
- Under the right conditions, fisheries are destroyed

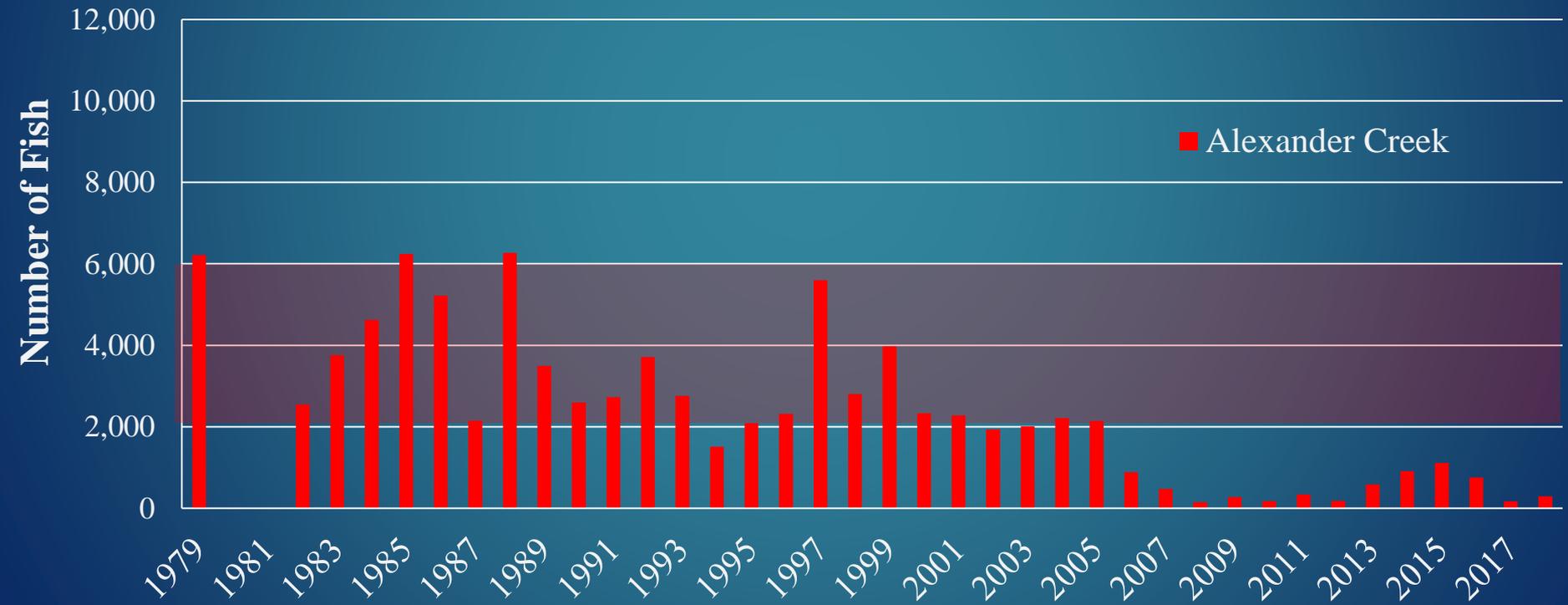


Historic Alexander Creek Chinook Fishery:

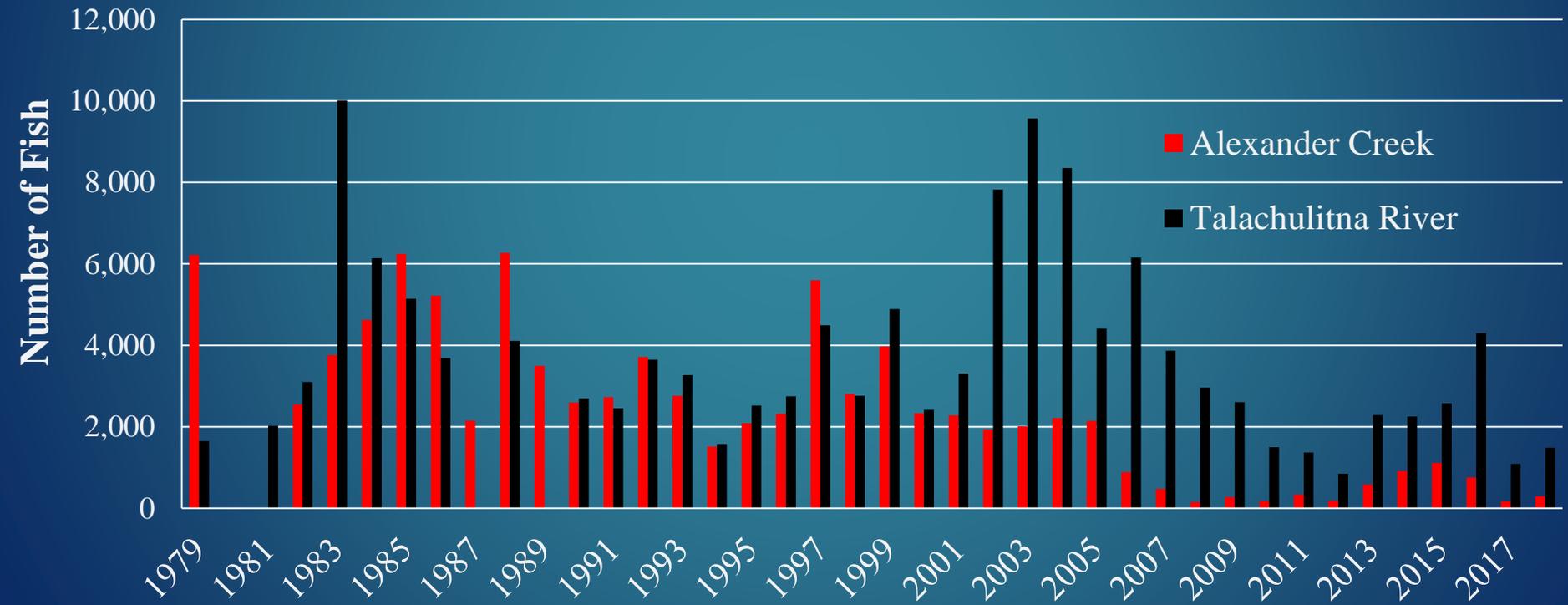
- 13 Fishing lodges
- 6 Charter companies
- Air charters
- Boat rental facilities
- Multi-million \$ industry

In 2008, when the declining Chinook fishery closed to harvest, the industry collapsed

Alexander Creek Chinook Salmon Escapement Index Counts



Alexander Creek and Talachulitna River Chinook Salmon Escapement Index Counts



Alexander Creek Pike Suppression



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

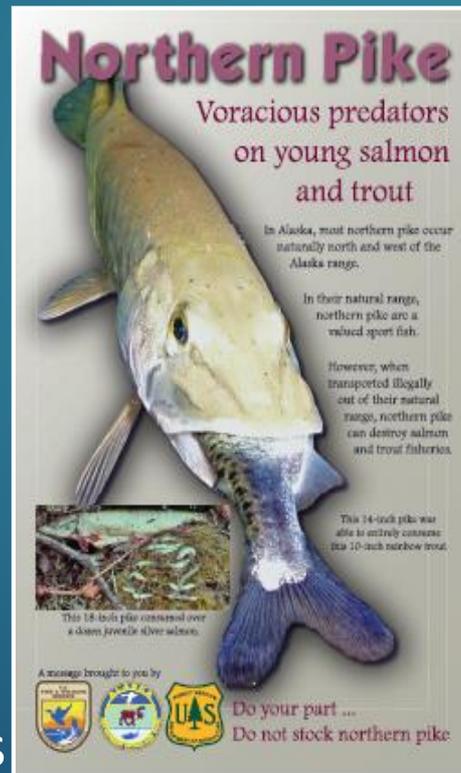
- Reduce pike in side-channel sloughs with gillnets
 - Began in 2011
 - During pike spawning
 - Field crews target ~60 sloughs
 - Annual effort (~20,000 pike removed since 2011)
- Surveys to evaluate juvenile salmonid abundance
 - Minnow trap surveys
 - Pike stomach content analysis

Management Strategies

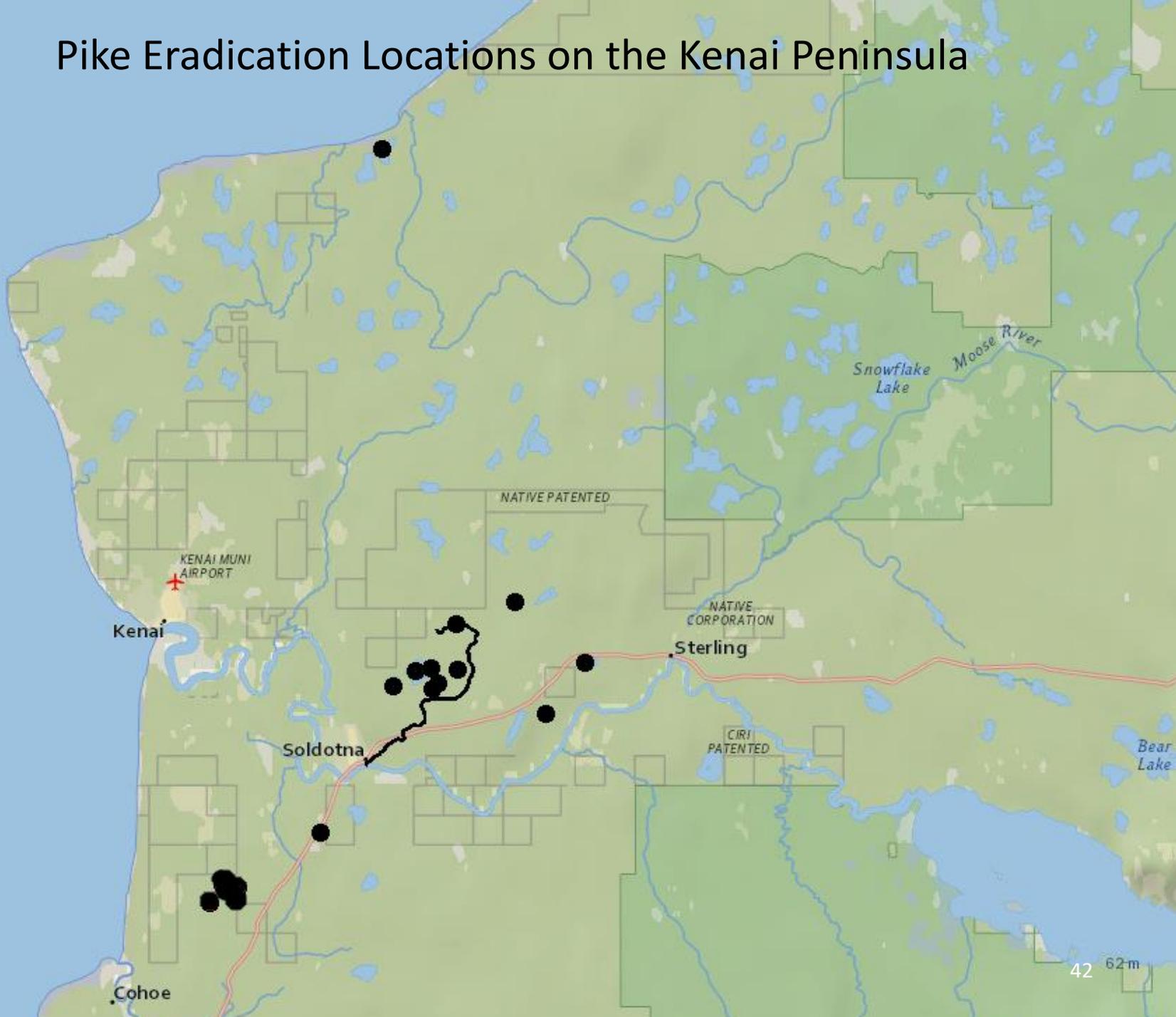
Prevention is the most effective strategy

For Existing Populations:

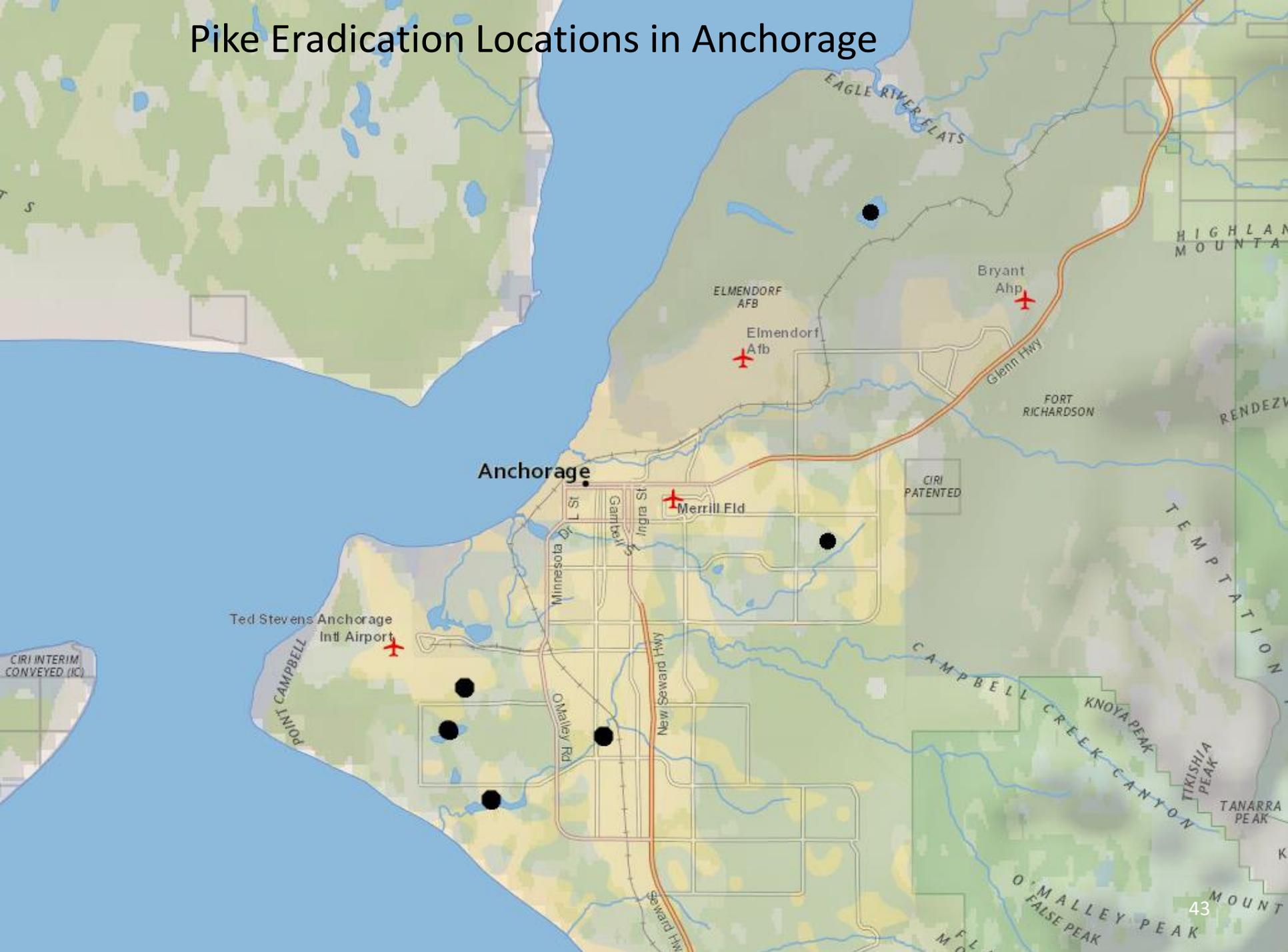
- Monitoring
- Early detection
- Prioritization
- Outreach
- Eradication
- Suppression
- Angler harvest
- Explore new tools



Pike Eradication Locations on the Kenai Peninsula



Pike Eradication Locations in Anchorage



Flooding

Deforestation

Over-Harvest

Pike Predation

Urbanization

Toxins

Beaver Dams

Run-off

Climate Change

Culverts

Pathogens

Development

Ocean Conditions

Offshore Bycatch

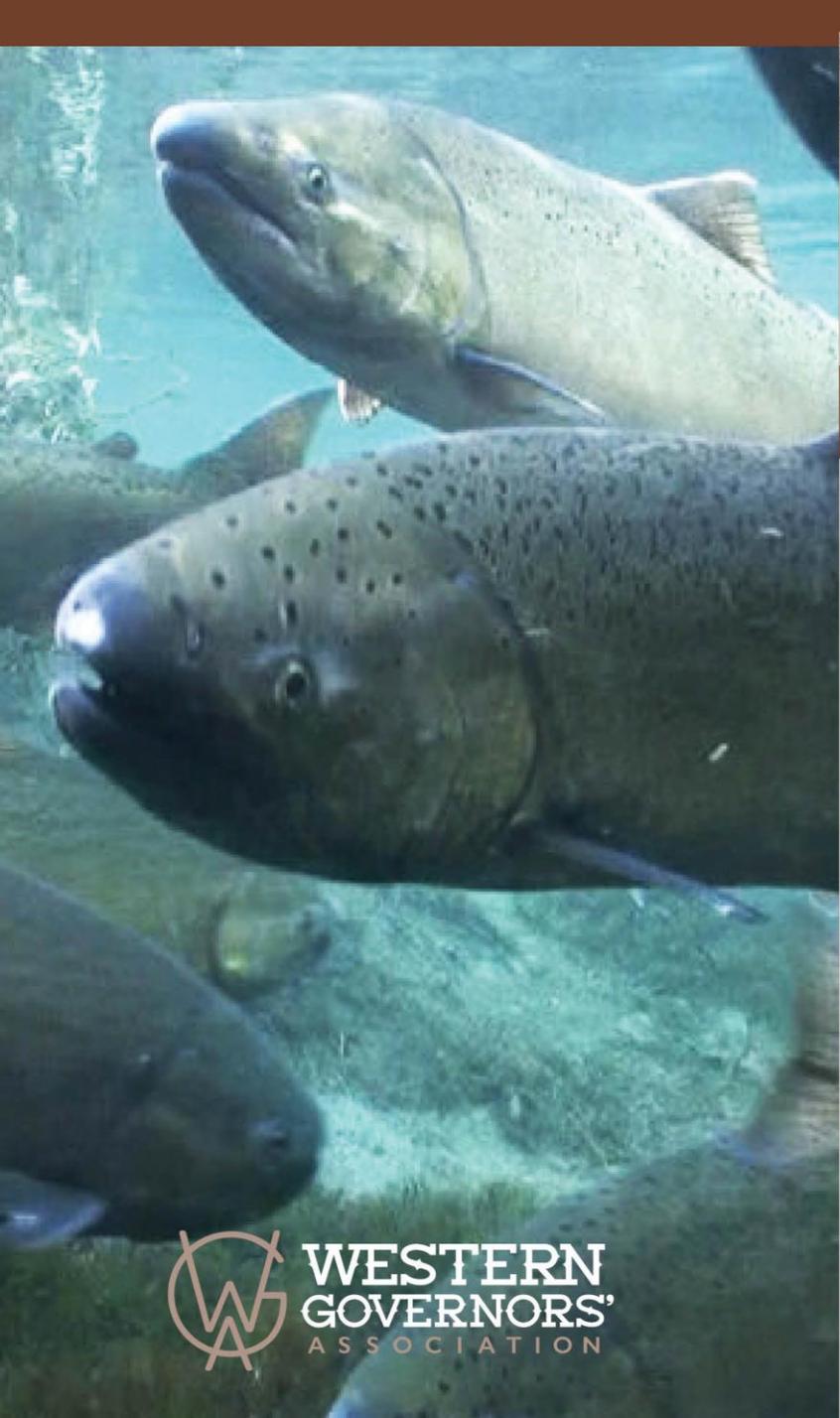
Water Temperature

Invasive Species

This presentation is over but efforts against invasive pike aren't!



Photo courtesy Steve McCurdy (ADFG) Innoko River, AK 1989.



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