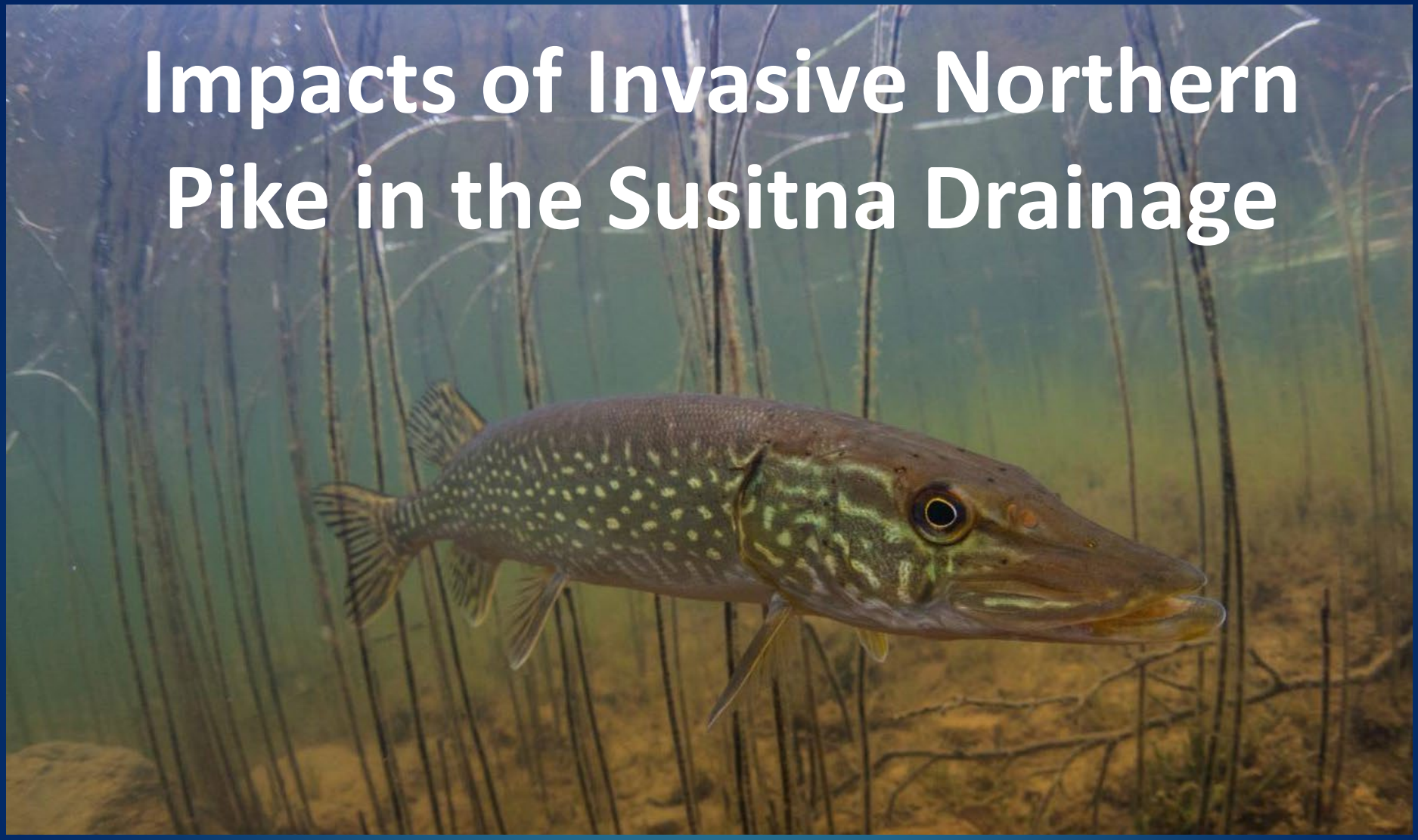
Impacts of Invasive Northern Pike in the Susitna Drainage



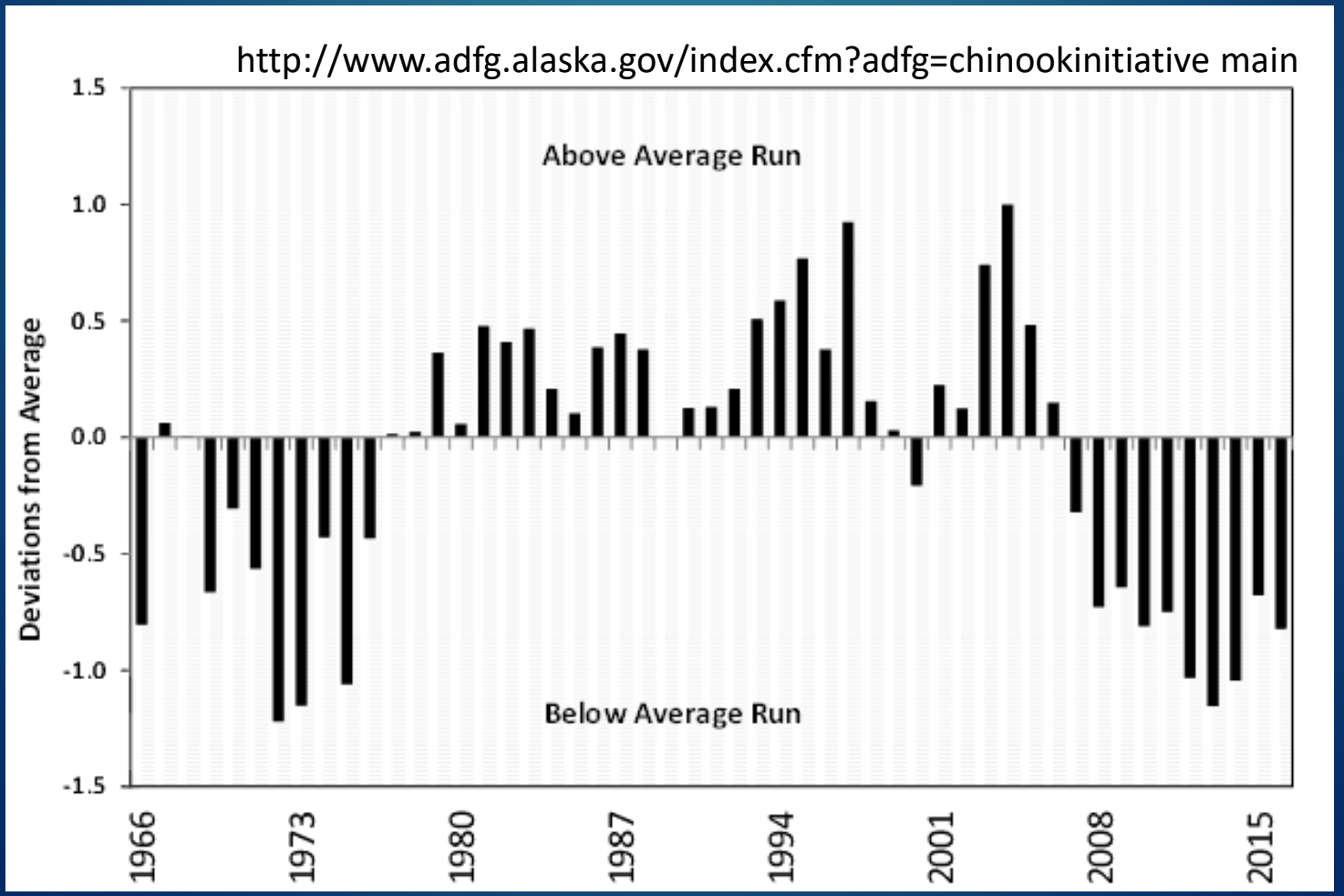
Tim McKinley, Kristine Dunker, Parker Bradley, Cody Jacobson

Alaska Department of Fish and Game

Sport Fish Division

Are Pike Causing Chinook Salmon Declines?

http://www.adfg.alaska.gov/index.cfm?adfg=chinookinitiative main



Presentation Outline:

- Northern Pike as an Invasive Species
- Pike Distribution in Southcentral AK
- Ecological Effects
- Habitat Distinctions
- Alexander Creek Case Study
- Management Strategies

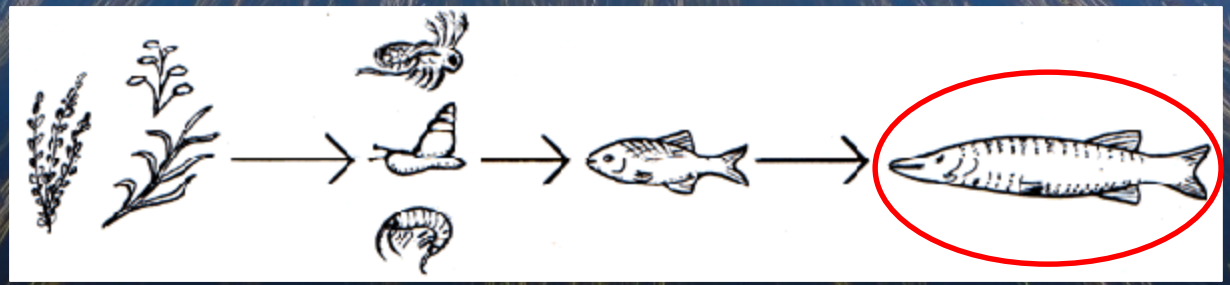
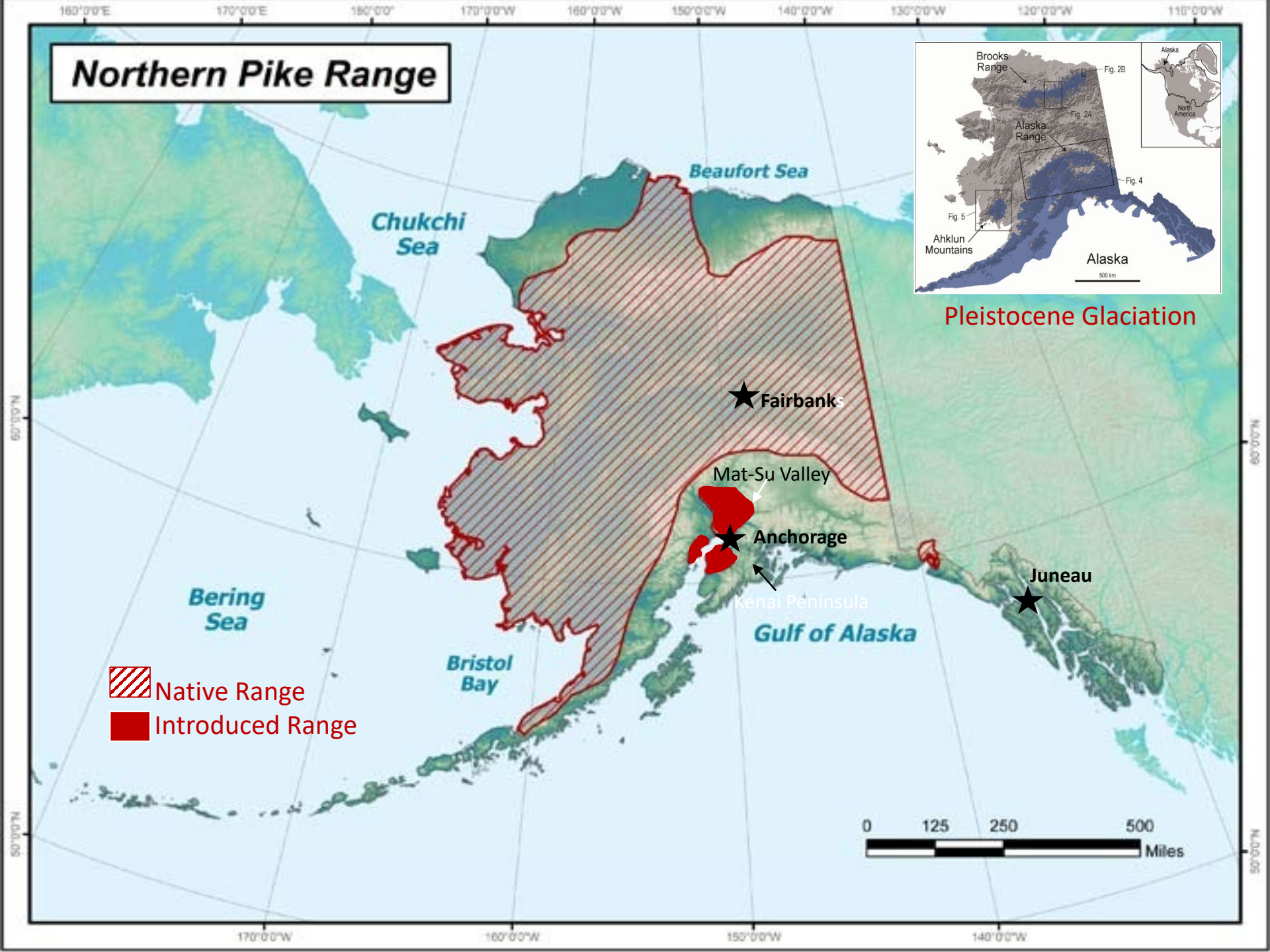


Photo Credit: Jason Ching

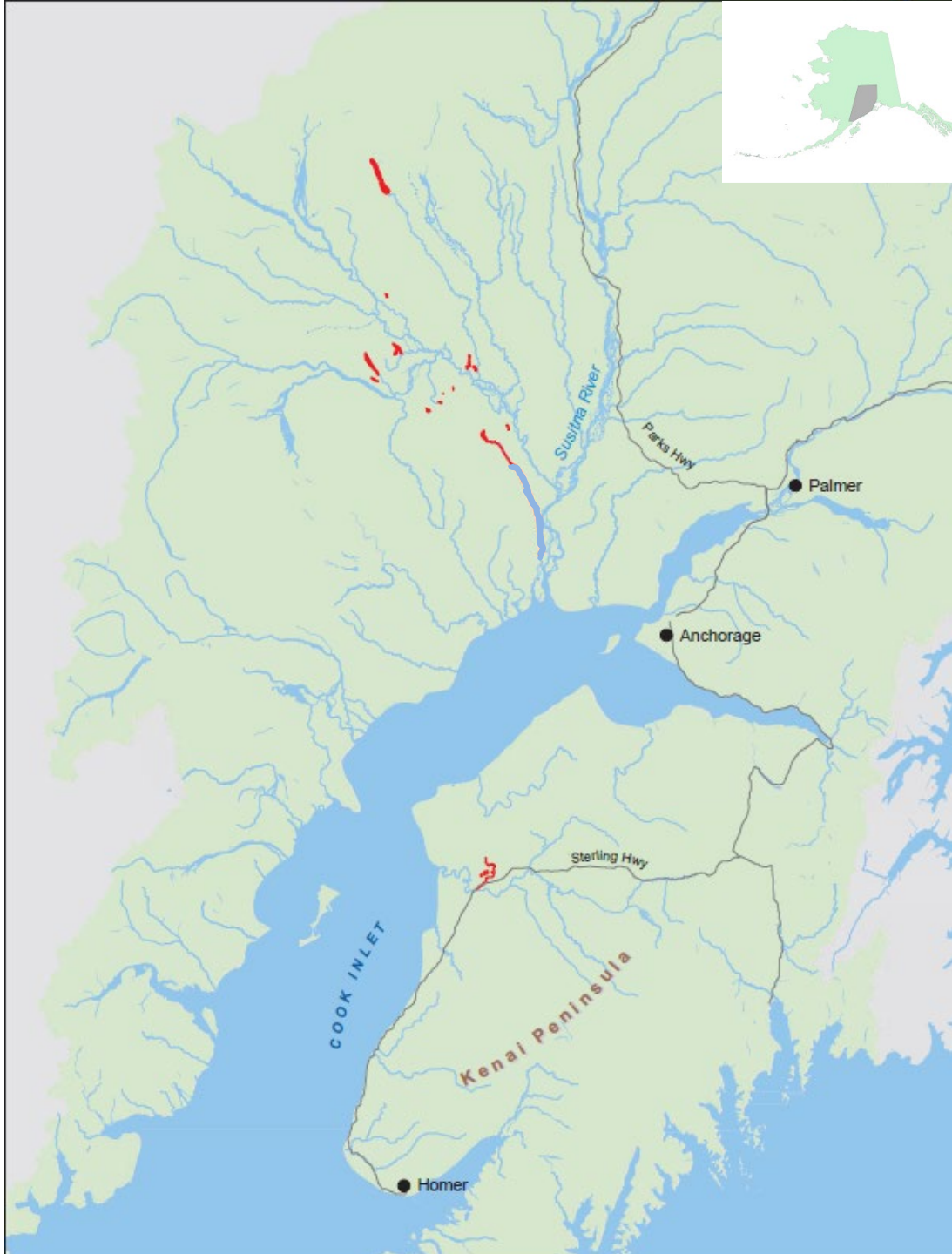

Northern Pike Range
Beaufort Sea
Chukchi Sea
Bering Sea
Bristol Bay
Gulf of Alaska
Fairbanks
Mat-Su Valley
Anchorage
Kenai Peninsula
Juneau
Native Range
Introduced Range
0 125 250 500
Miles
Brooks Range
Alaska Range
Ahklun Mountains
Fig. 2B
Fig. 2A
Fig. 4
Fig. 5
Alaska
North America
Alaska
Pleistocene Glaciation

Northern Pike Dispersal in Southcentral Alaska

1950s – 1960s

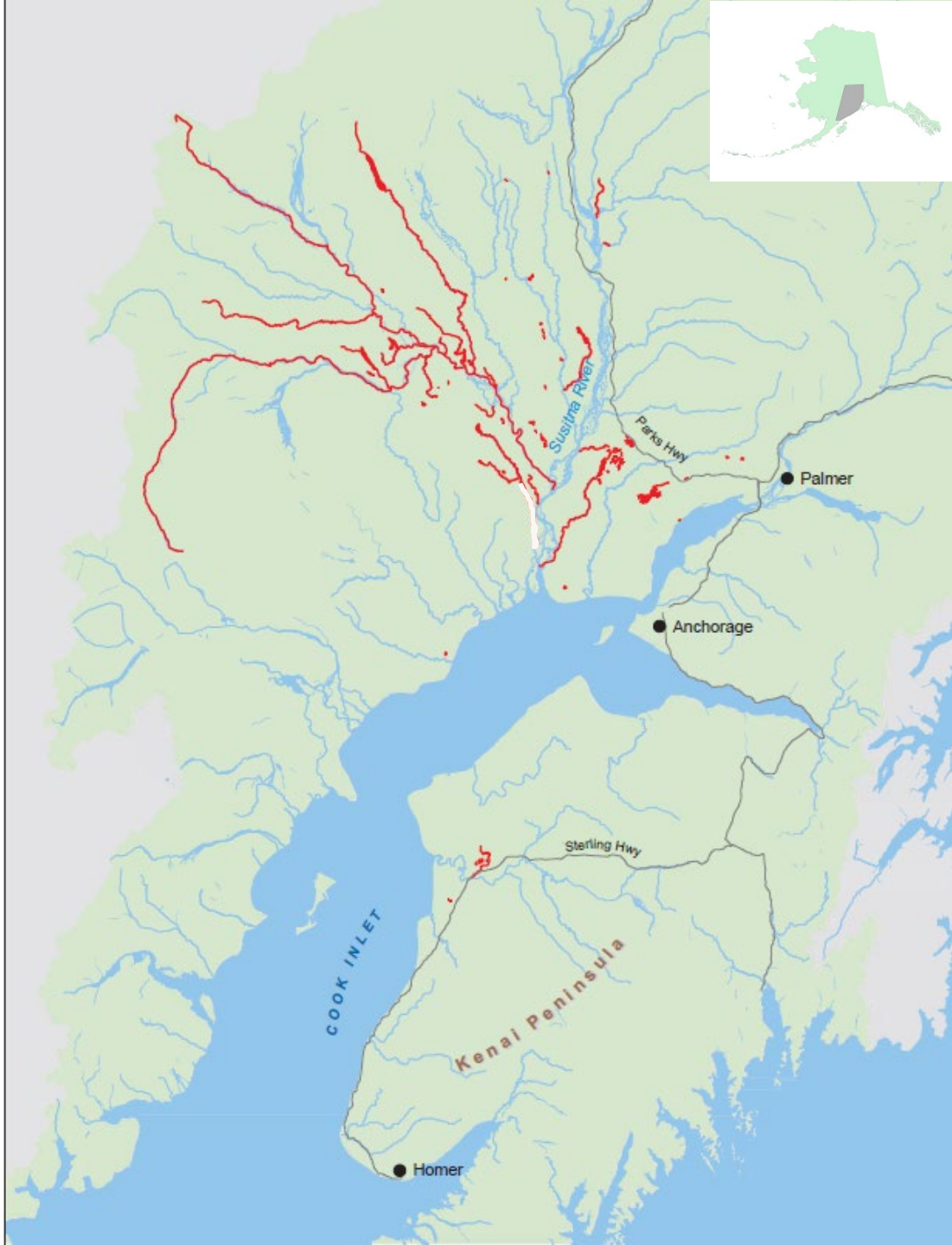
Northern Pike Dispersal in Southcentral Alaska

1970s



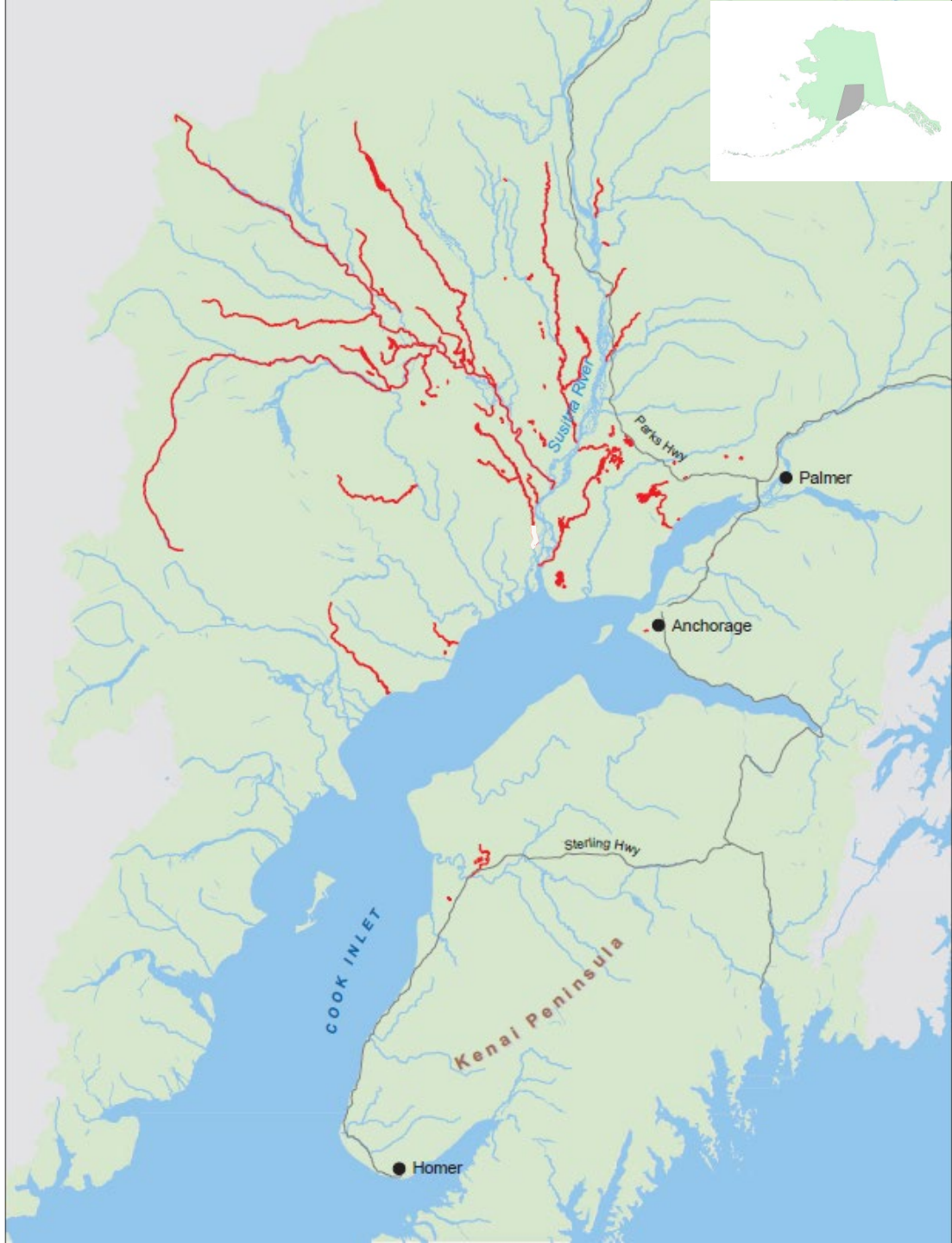
Northern Pike Dispersal in Southcentral Alaska

1980s



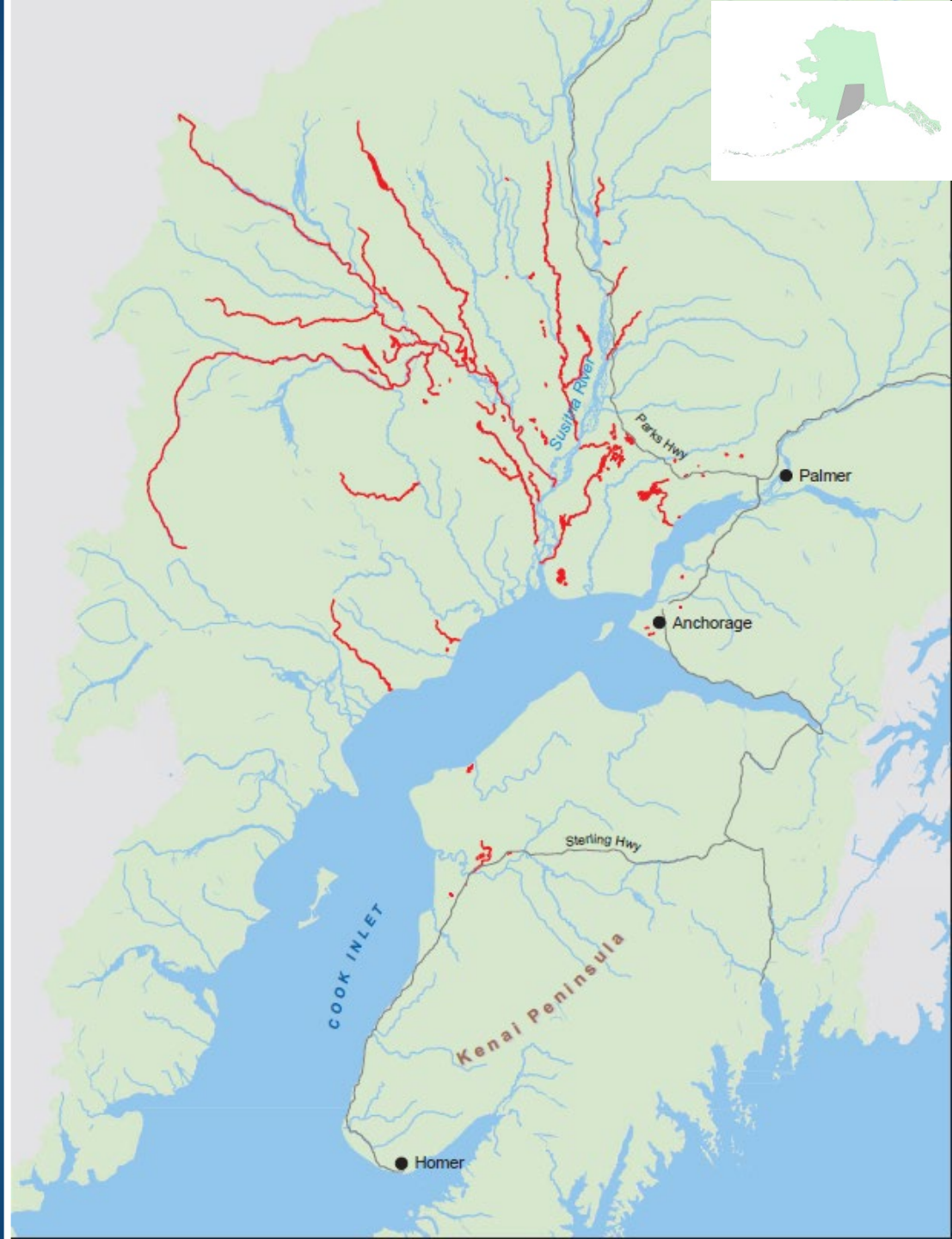
Northern Pike Dispersal in Southcentral Alaska

1990s



Northern Pike Dispersal in Southcentral Alaska

2000s

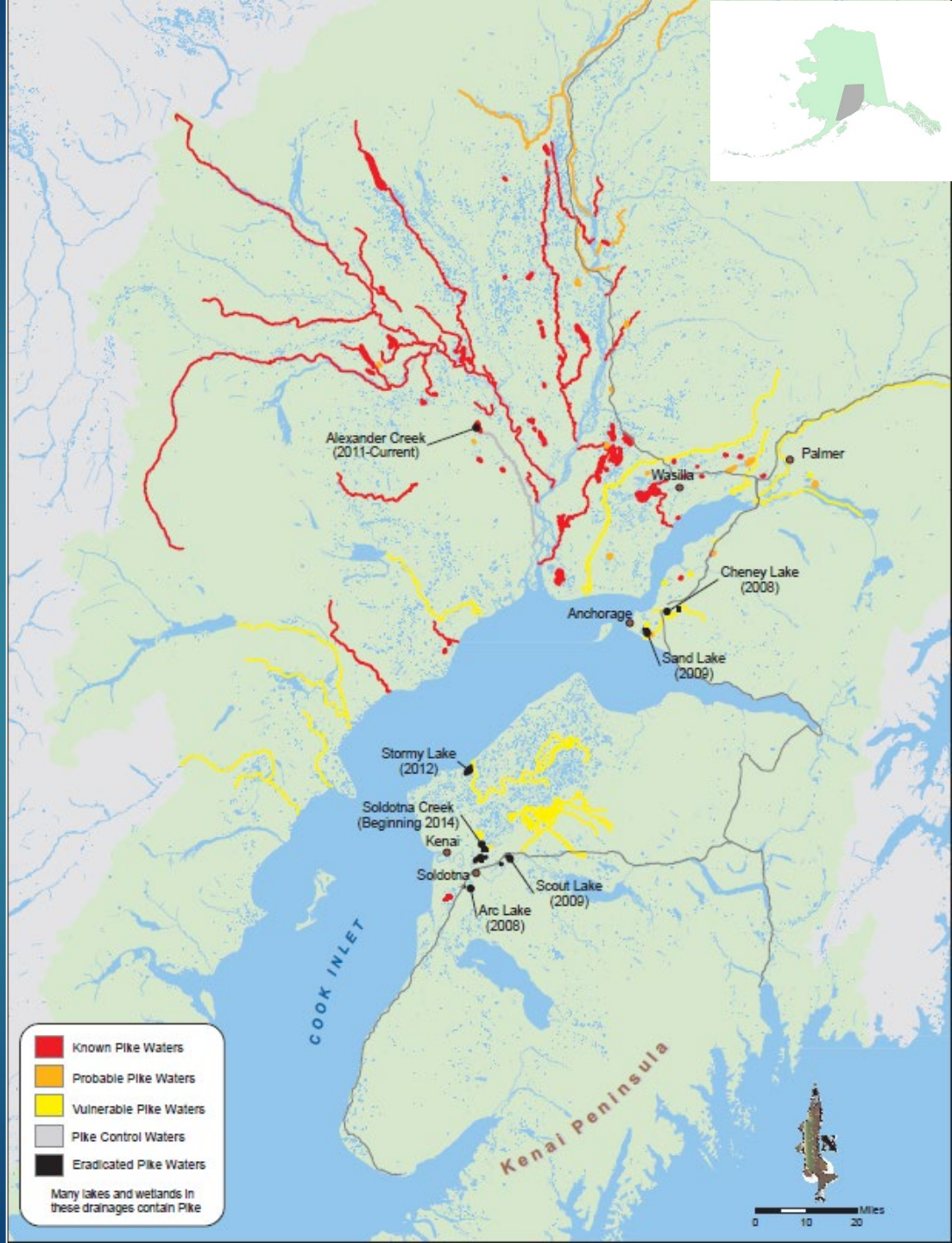


Northern Pike Dispersal in Southcentral Alaska

Today

> 100 water bodies with invasive pike

Pike are an invasive species in these waters



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

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

Pike are Predators in their Native Range

Photo Credit: Jason Ching

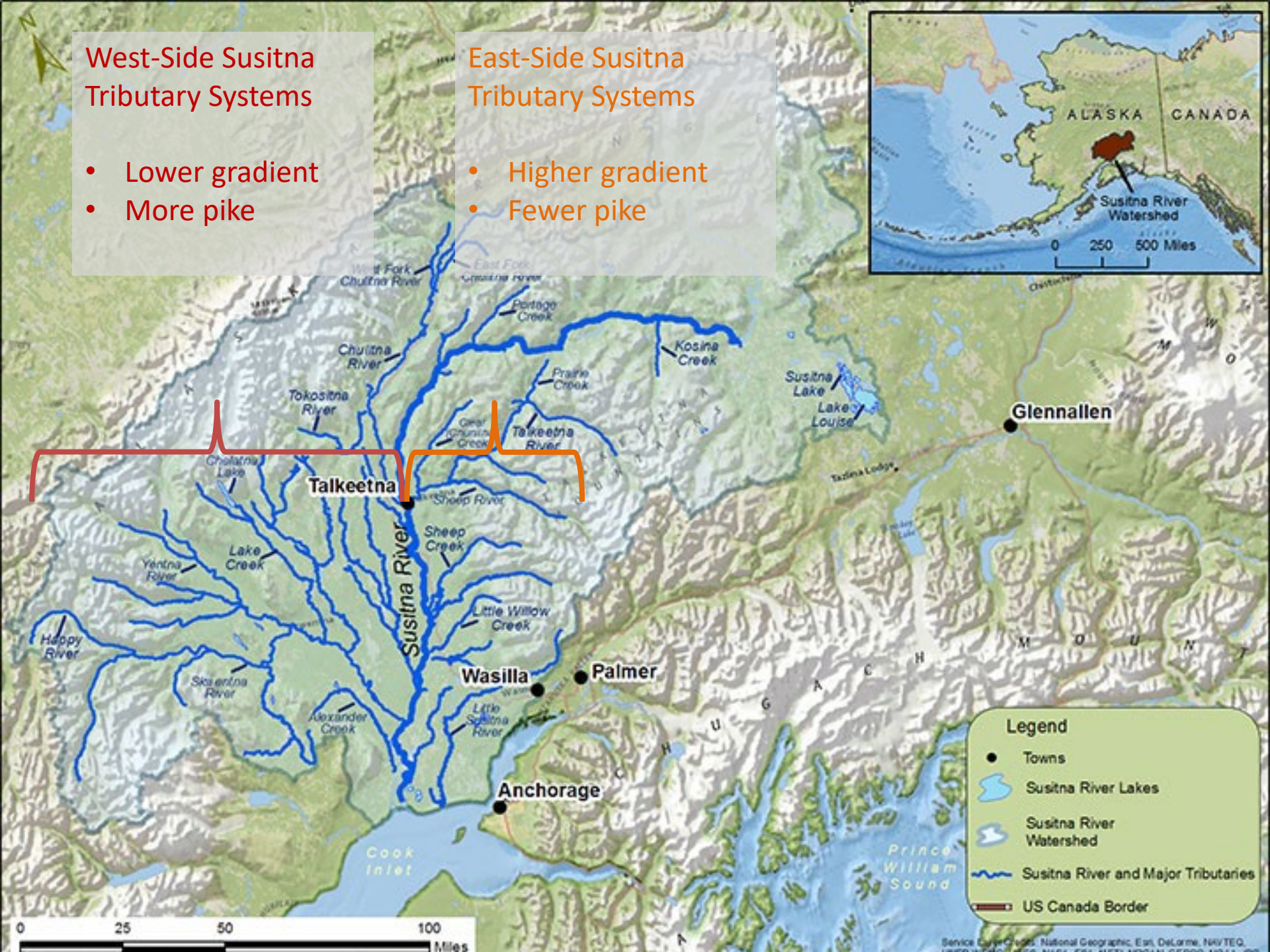
Native Range:

- Huge drainages with complex habitats
- Chinook declines occurring in places like the Kuskokwim and Yukon Rivers where pike presence is not recent

Wood Tick-chick State Park
Photo Credit: Michael Melford

- Where pike have been introduced, juvenile salmonids often rear in these same habitats.
- Impacts tend to be greatest when there is a high degree of habitat overlap with northern pike.
- Habitat variability may mitigate the degree of predation risk.

Role of Habitat Variability in Pike Predation Risk


West-Side Susitna Tributary Systems
• Lower gradient
• More pike
East-Side Susitna Tributary Systems
• Higher gradient
• Fewer pike
ALASKA
CANADA
Susitna River Watershed
0 250 500 Miles
Talkeetna
Susitna River
Glennallen
Wasilla
Palmer
Anchorage
Cook Inlet
Prince William Sound
Chulitna River
Tokositna River
Talkeetna River
Kosina Creek
Portage Creek
Prairie Creek
Sheep Creek
Lake Creek
Little Willow Creek
Alexander Creek
Little Susitna River
Happy River
Yentna River
Skwentna River
Susitna Lake
Lake Louise
Legend
Towns
Susitna River Lakes
Susitna River Watershed
Susitna River and Major Tributaries
US Canada Border
0 25 50 100 Miles

Alexander Creek Case Study

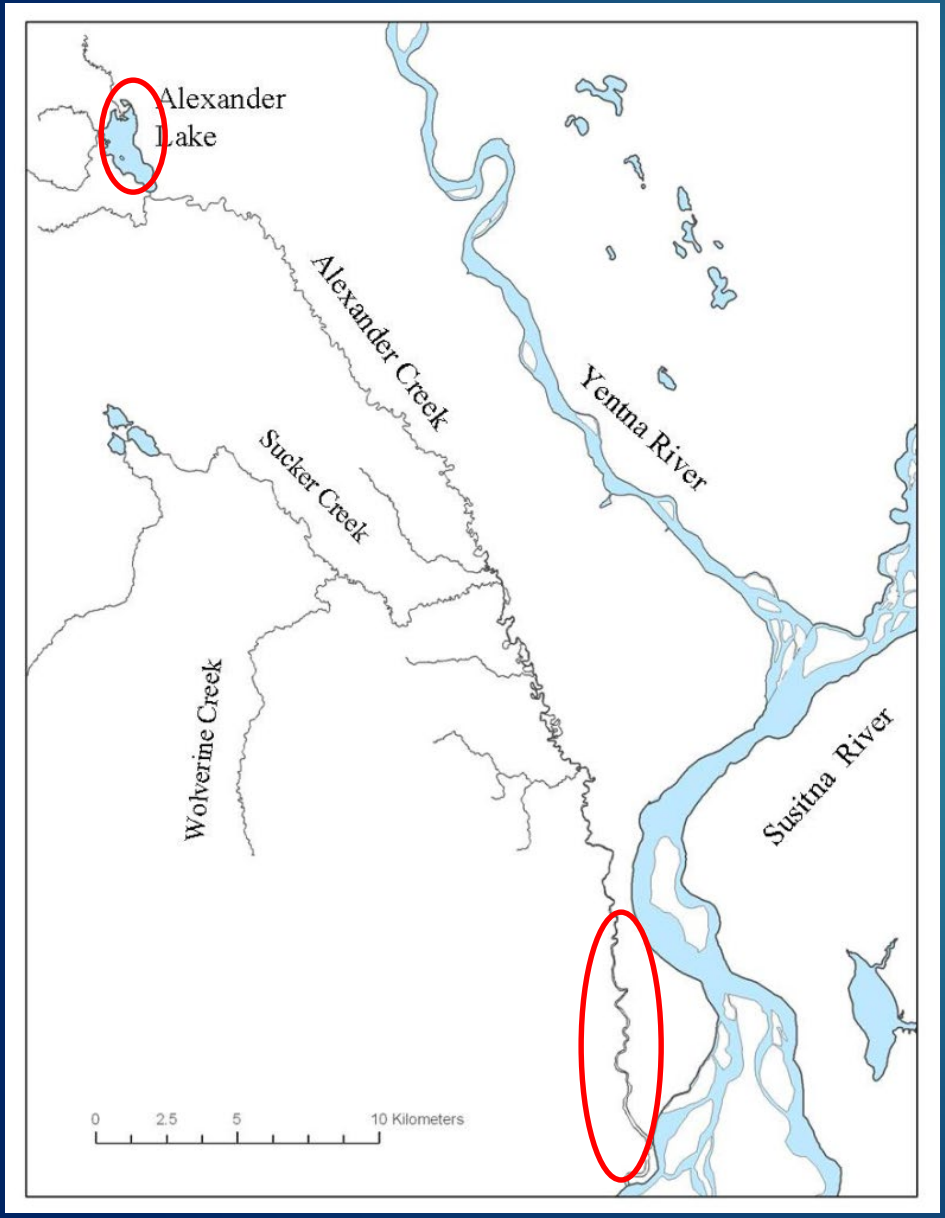
- **Pike should be considered a significant threat**
- **Under the right conditions, fisheries are destroyed**

Historic Alexander Creek Chinook Fishery:

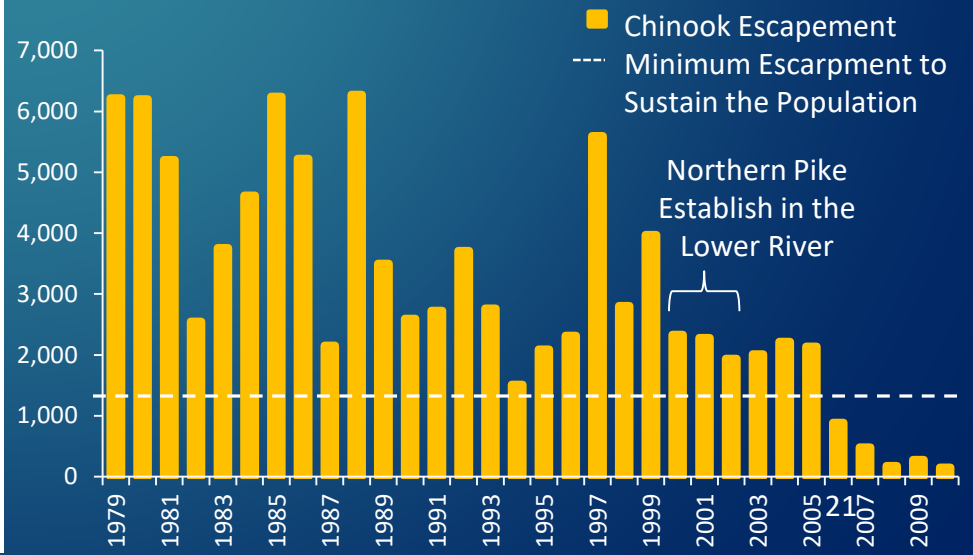
- **13 Fishing lodges**
- **6 Charter companies**
- **Air charters**
- **Boat rental facilities**
- **Multi-million $ industry**

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

Alexander Creek Case Study



- 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
- Chinook fisheries are now closed

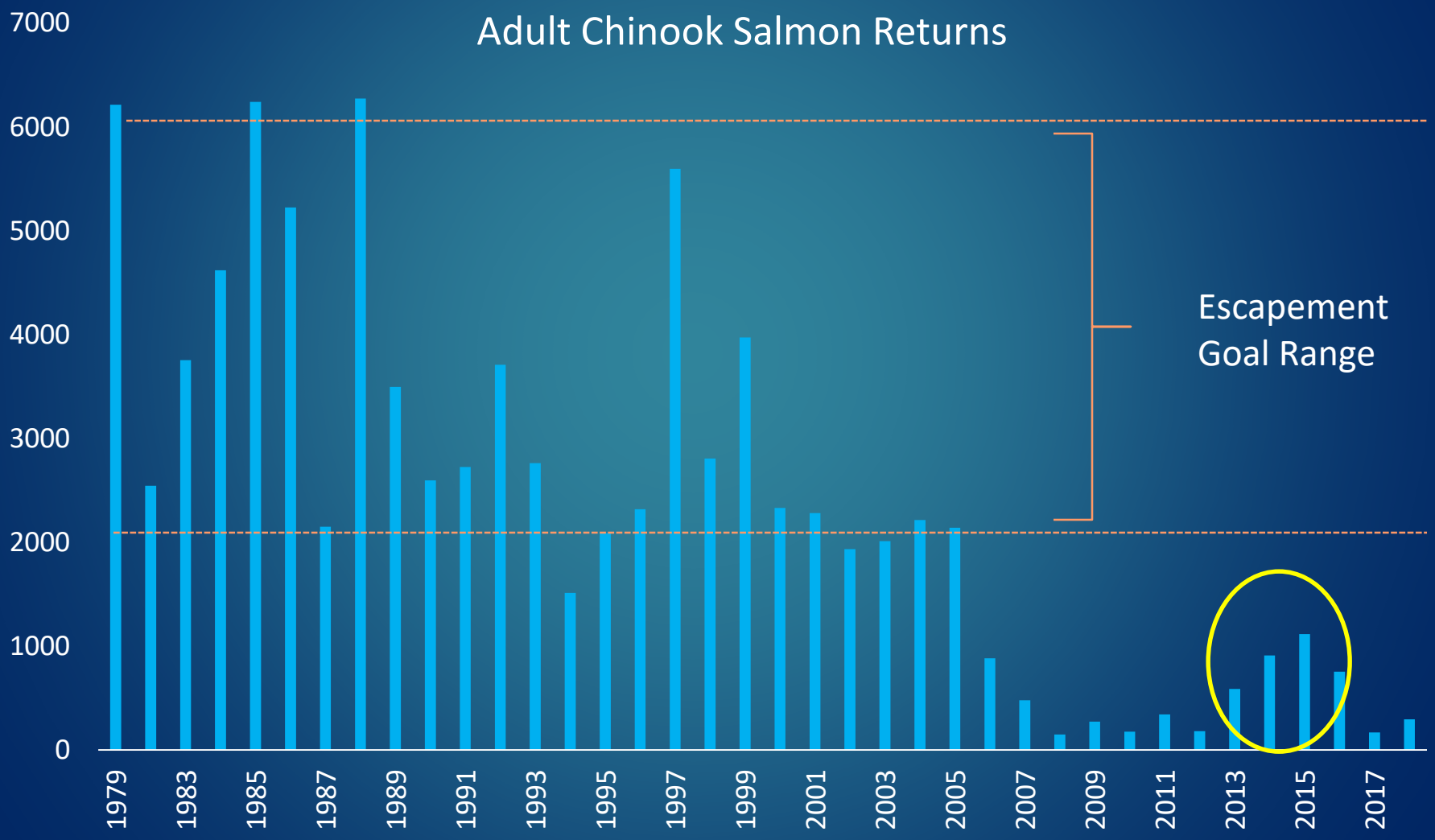


Alexander Creek Pike Suppression

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

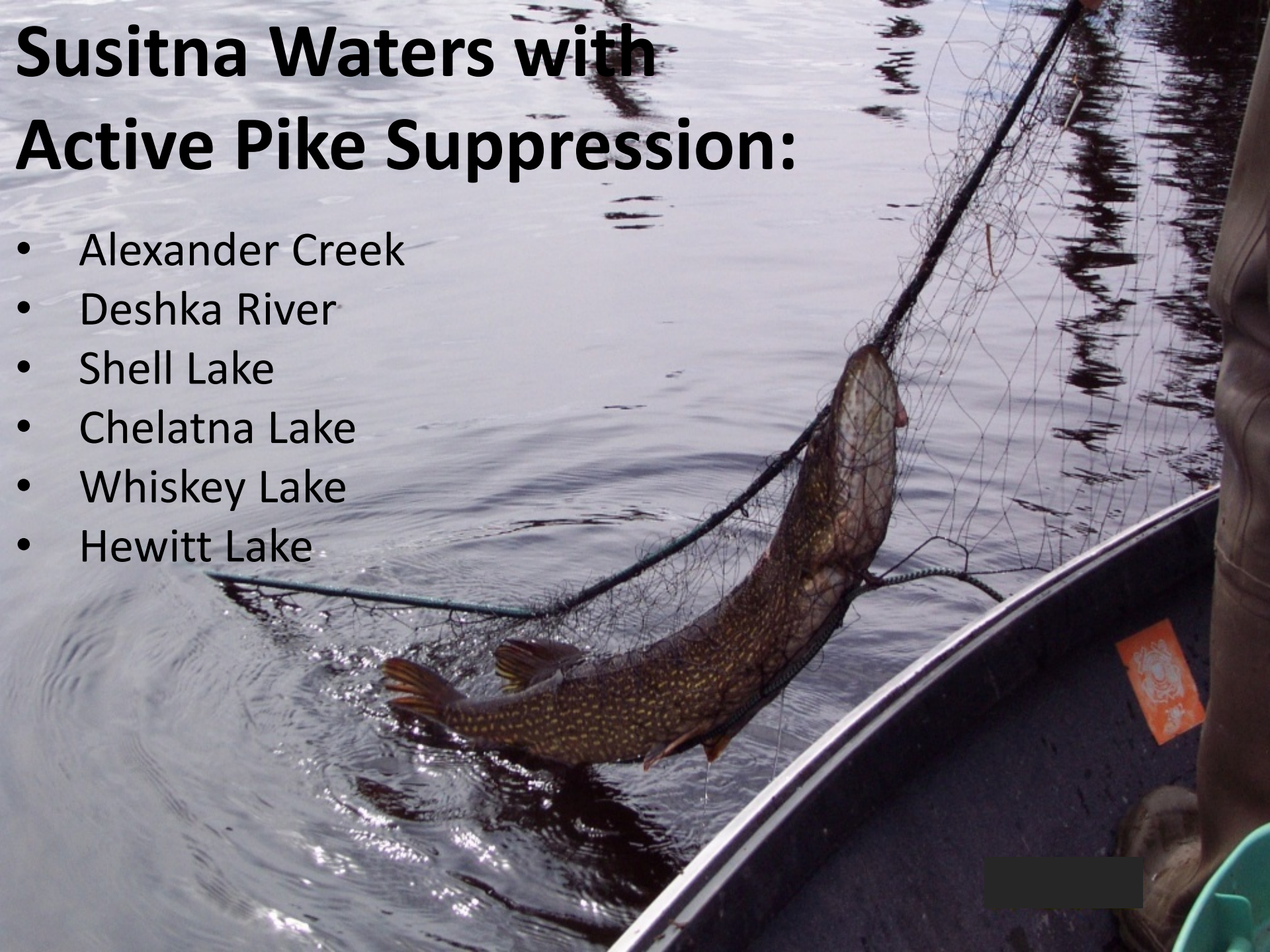
- Reduce pike in side-channel sloughs with gillnets
  - Began in 2011
  - During pike spawning
  - Field crews target ~60 sloughs
  - Annual effort (~20,000 pike removed since 2011)
- Surveys to evaluate juvenile salmonid abundance
  - Minnow trap surveys
  - Pike stomach content analysis

Alexander Creek Pike Suppression



Susitna Waters with Active Pike Suppression:

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

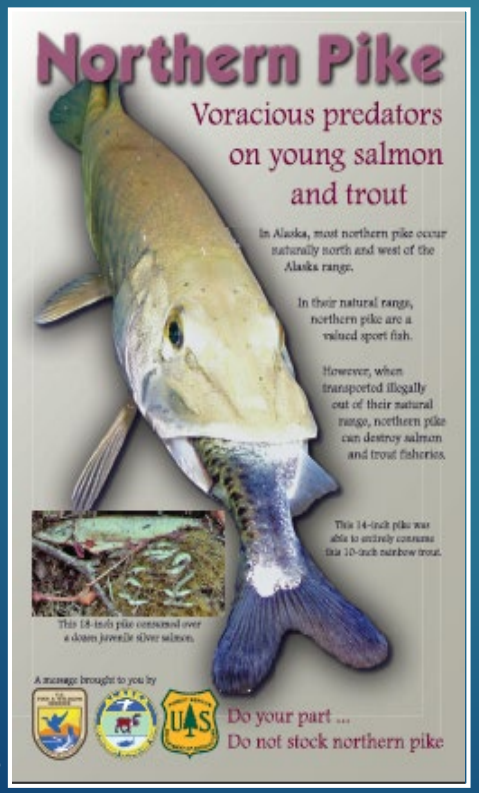


Management Strategies

Prevention is the most effective strategy

For Existing Populations:

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



Acknowledgements