Preserving Alaska's resources by managing invasive species.

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Alaska Regional Invasive Species Program Coordinator

US Fish and Wildlife Service

March, 2020

What is at stake?

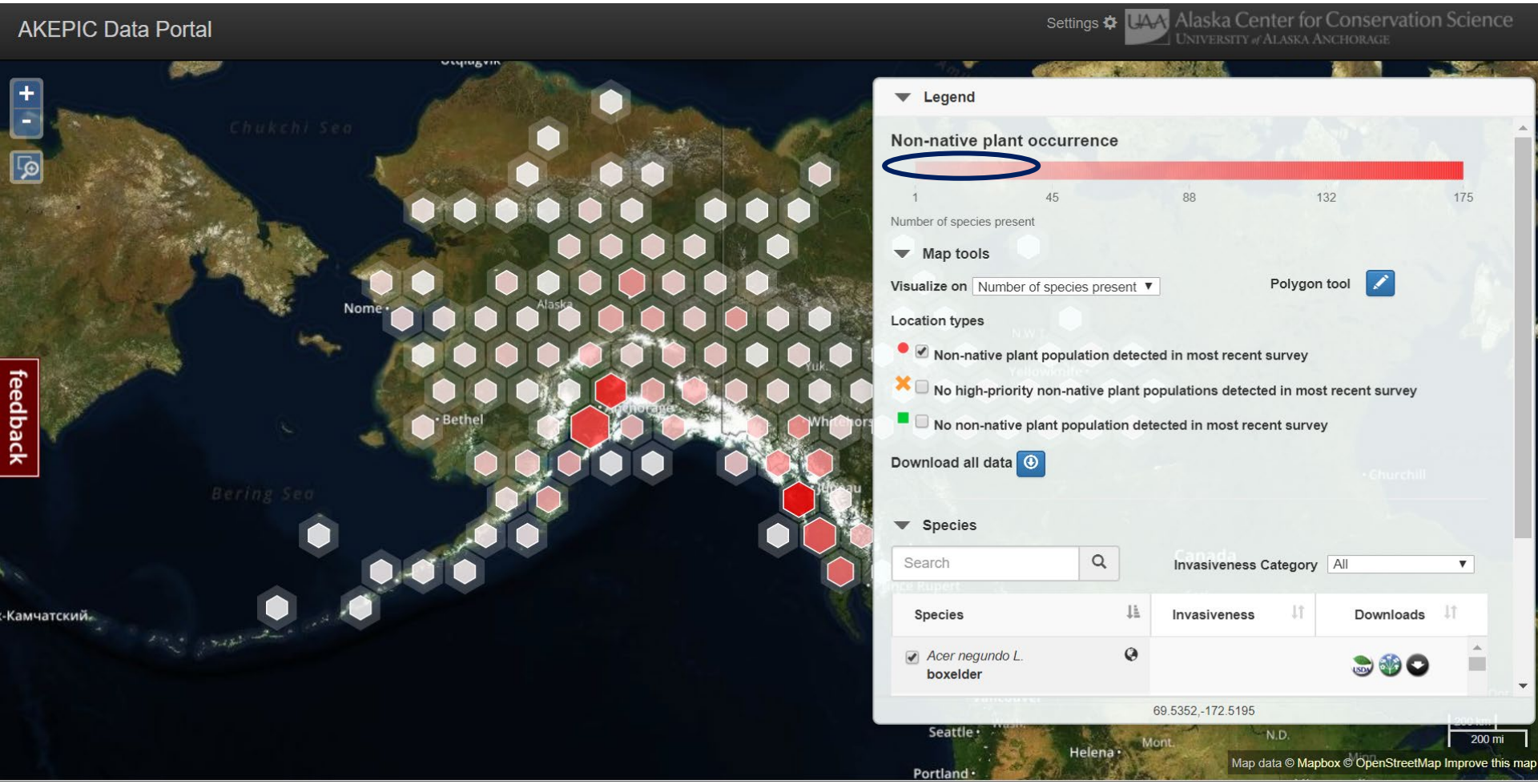
- Infrastructure:
  - Floatplanes:
    - 114 floatplane bases (40% of all towns)
    - Lake Hood floatplane base
      - ~200 daily takeoffs, 600 peak
      - **$56 Million** (labor + economic activity)
  - Watercraft:
    - 68,616 registered watercraft (1/every 9 Alaskans)
    - **$587M** annual economic impact
  - Hydropower facilities:
    - 21% of the state's power

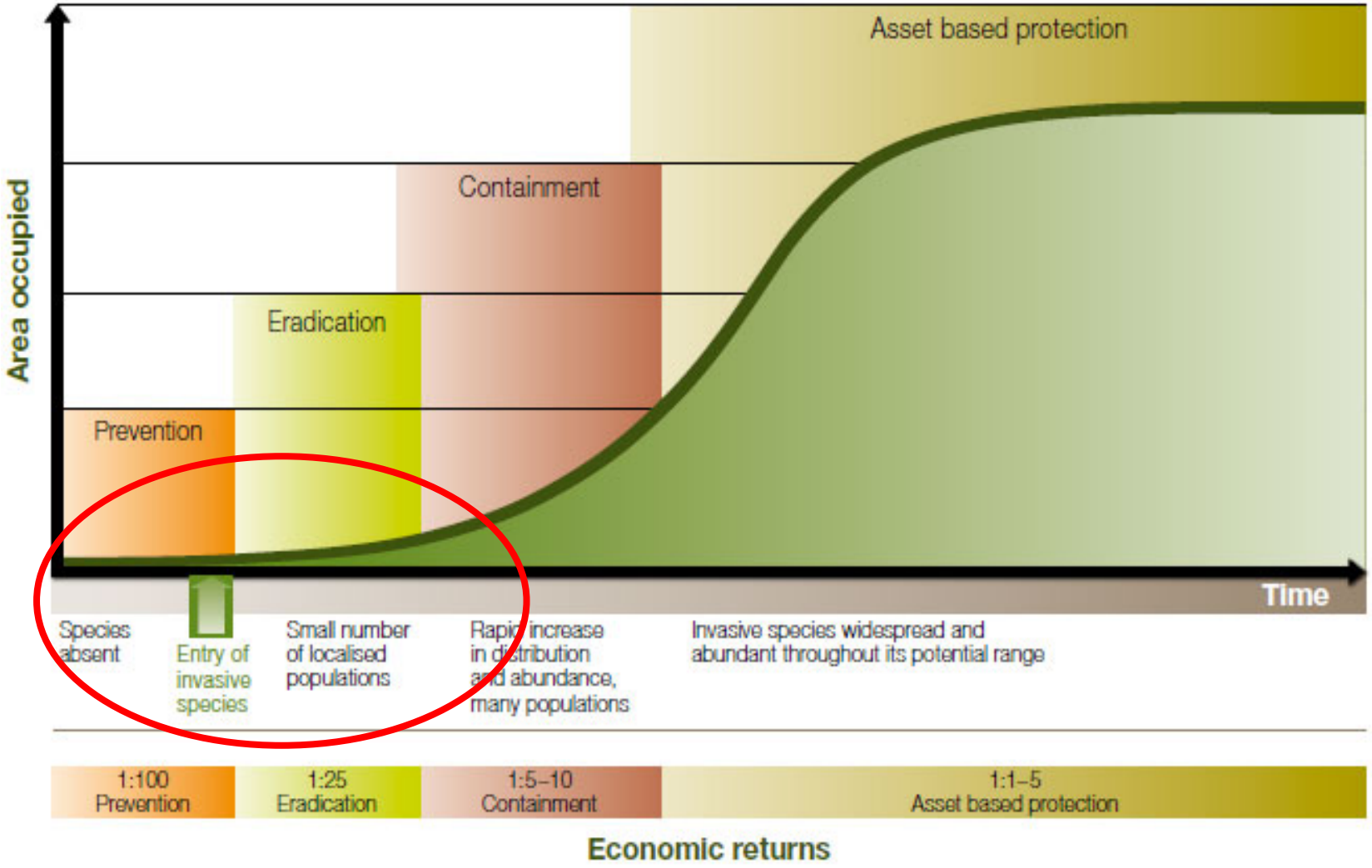
- Native fish and wildlife
  - Hunting and Wildlife Viewing - $7.5B
  - Sport Fishing - $2.4B
  - Salmon commercial fisheries - $4.2B

Photo credits: 1) Salty Dog Boating News, 2) USFWS

35 aquatic invasive species have been reported in Alaska.

(USGS NAS database 03/14/20)





First step in prevention is to understand risk = vectors and suitability.

Prevention: Quagga and Zebra Mussels

ssels (*Dreissena bugensis*)

Zebra and Quagga Mussel Sightings Distribution

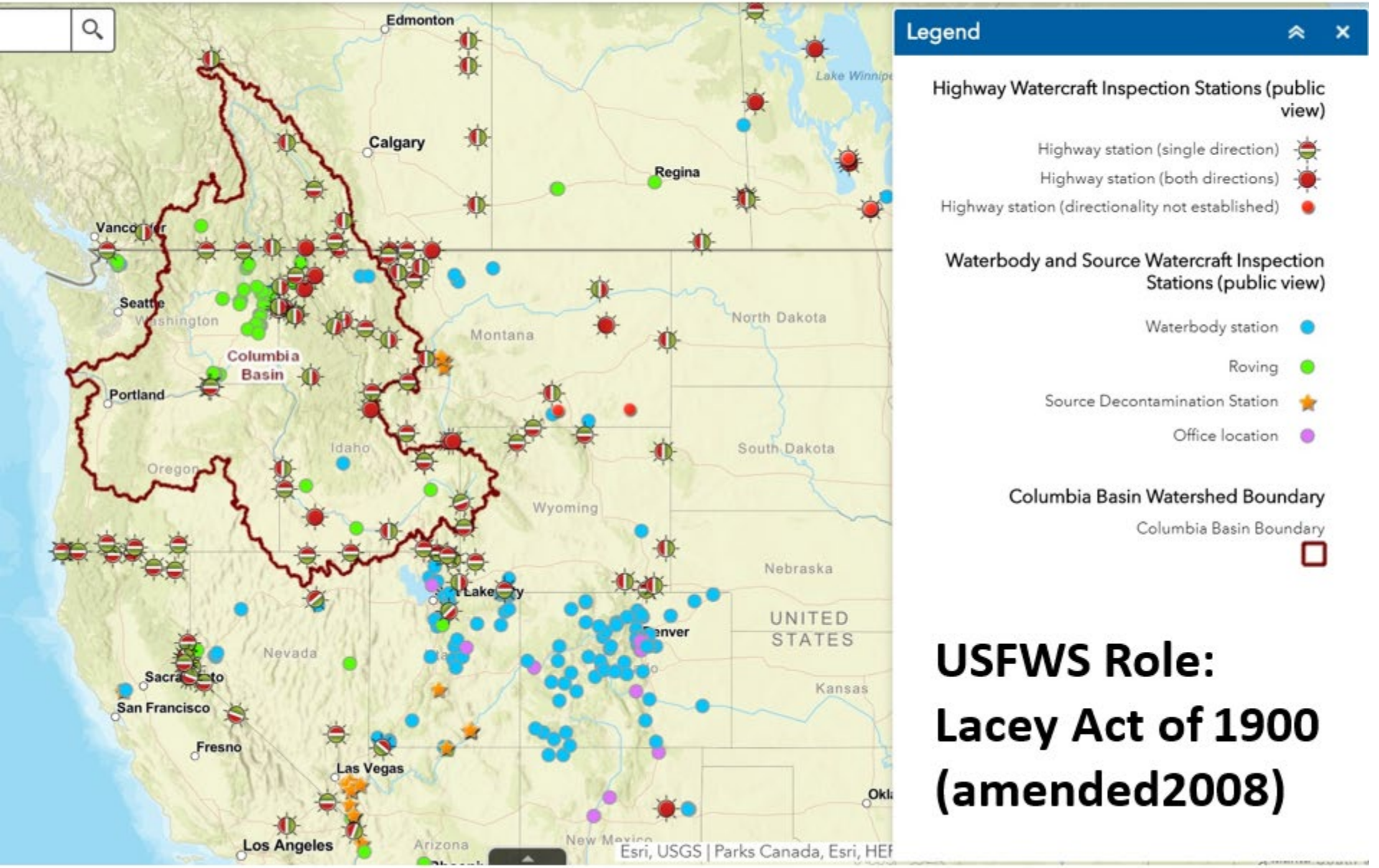
Dreissena polymorpha and D. rostriformis bugensis

USGS science for a changing world

- Zebra mussel occurrences
- Quagga mussel occurrences
- Zebra or Quagga mussel occurrences
- Both species occurrences
- Zebra/Quagga mussels eradicated
- Zebra/Quagga mussels failed

Map produced by the U.S. Geological Survey
Nonindigenous Aquatic Species Database, August 12, 2019.

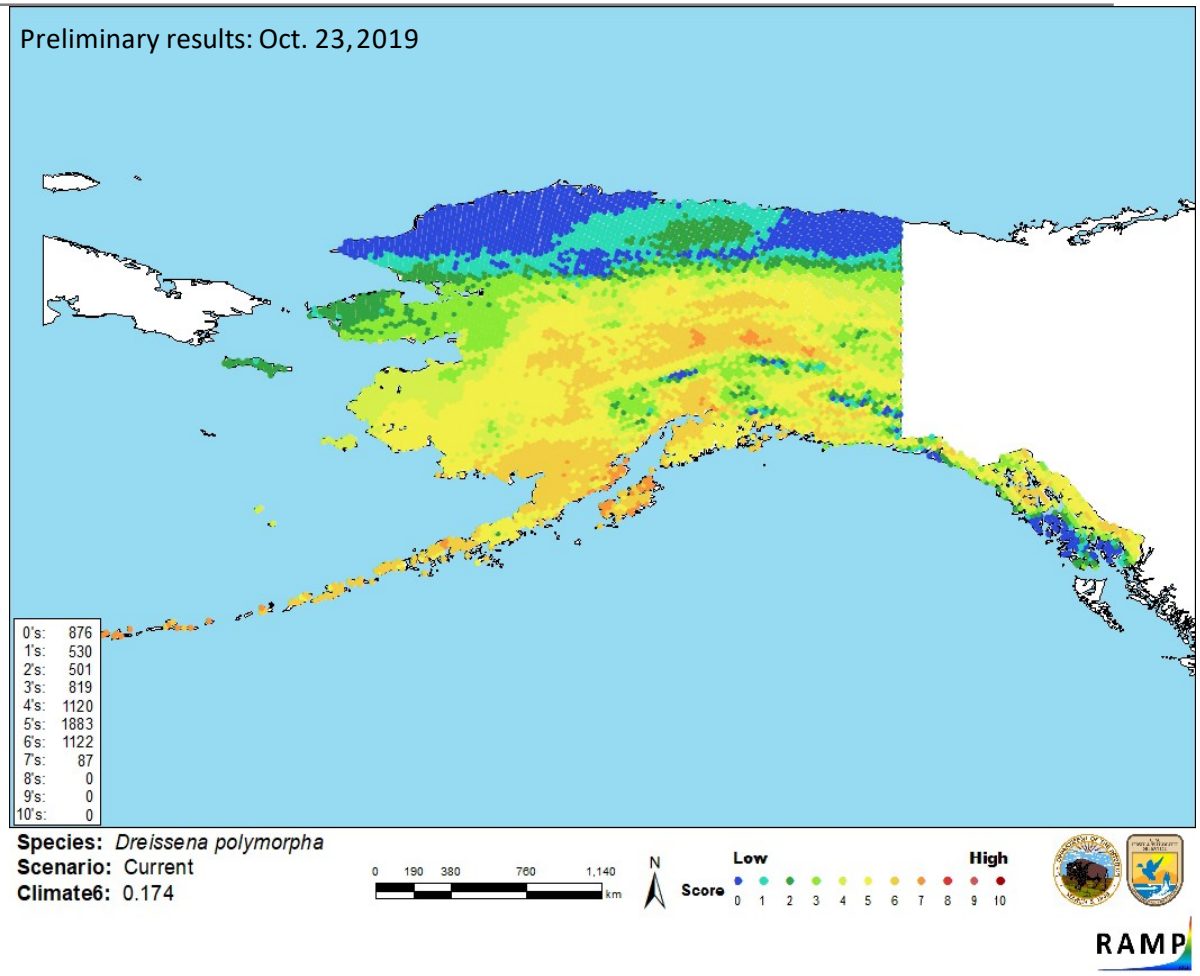
Western Watercraft Inspection and Decontamination Stations



USFWS Role: Lacey Act of 1900 (amended2008)

Results

- Research suggests high habitat suitability for invasive mollusks.
- No confirmed reports of invasive mollusks.
  - Smith et al. 2005
  - D. Bogan 2012 – AKISP presentation Kodiak 2012



Quagga and Zebra Mussels

- Alaska has 3 native mussels and 21% of state's power comes from hydropower facilities.

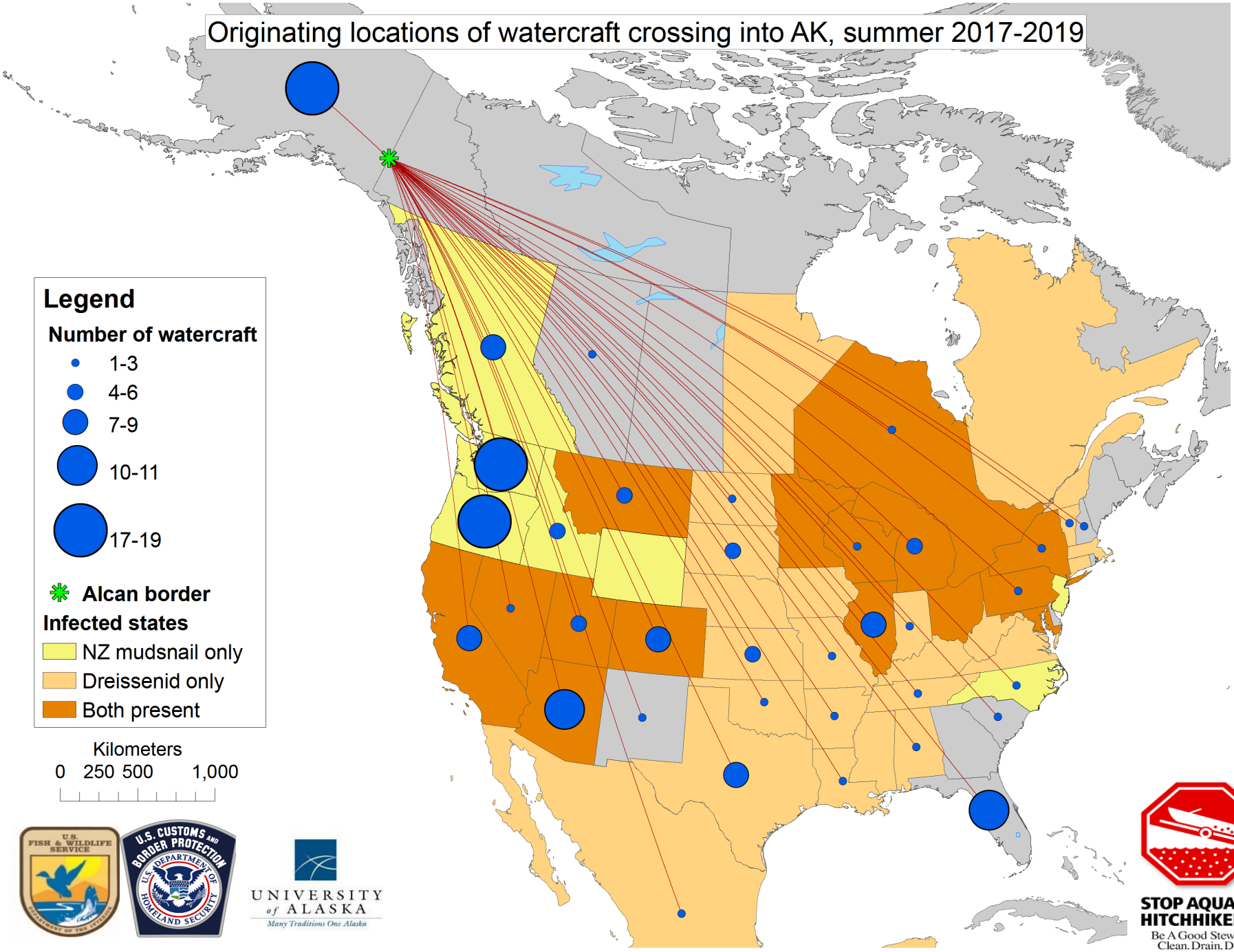
- 226 watercraft inspected (2017-19) at Alcan Port of Entry:
  - **70%** not inspected in route, 30% inspected in-route
  - **38%** coming from a state with Q/Z mussels, 62% coming from states without

- No live mussels detected yet, but…

- Currently assessing other critical control points in BC, WA, and OR.

Sailboat being decontaminated, Tok AK July 2019

Originating locations of watercraft crossing into AK, summer 2017-2019



U.S. FISH & WILDLIFE SERVICE

U.S. CUSTOMS AND BORDER PROTECTION

UNIVERSITY of ALASKA
Many Traditions One Alaska

STOP AQUATIC HITCHHIKERS!™
Be A Good Steward.
Clean. Drain. Dry.
StopAquaticHitchhikers.org

Prevention and Eradication: Elodea

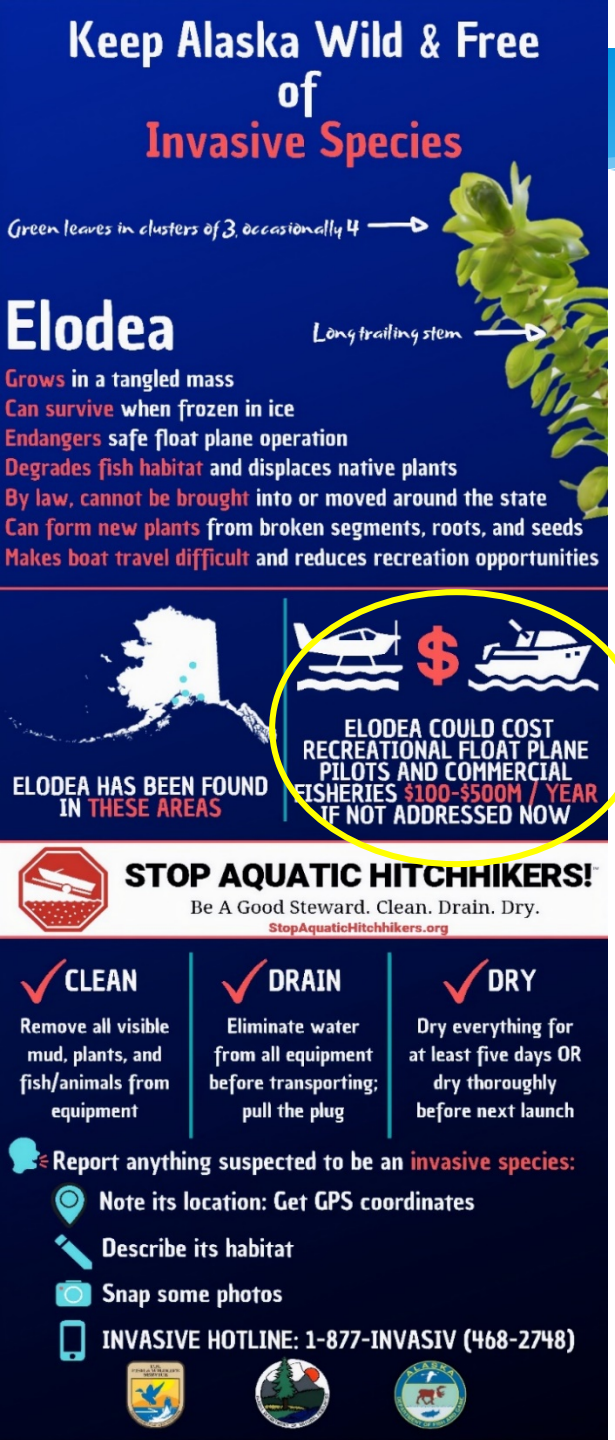
- Background:
  - Alaska's 1st submerged aquatic invasive plant
    - Native to the Pacific Northwest and New England
  - Introduced through aquarium dumps

- Impacts:
  - Habitat degradation/ loss for fish and wetland obligate species
  - Reduced biodiversity, fishing opportunities, floatplane and watercraft safety
  - Increased sedimentation

FAIRBANKS SOIL & WATER CONSERVATION DISTRICT

Homer Soil & Water CONSERVATION DISTRICT

Prevention and Eradication: Elodea

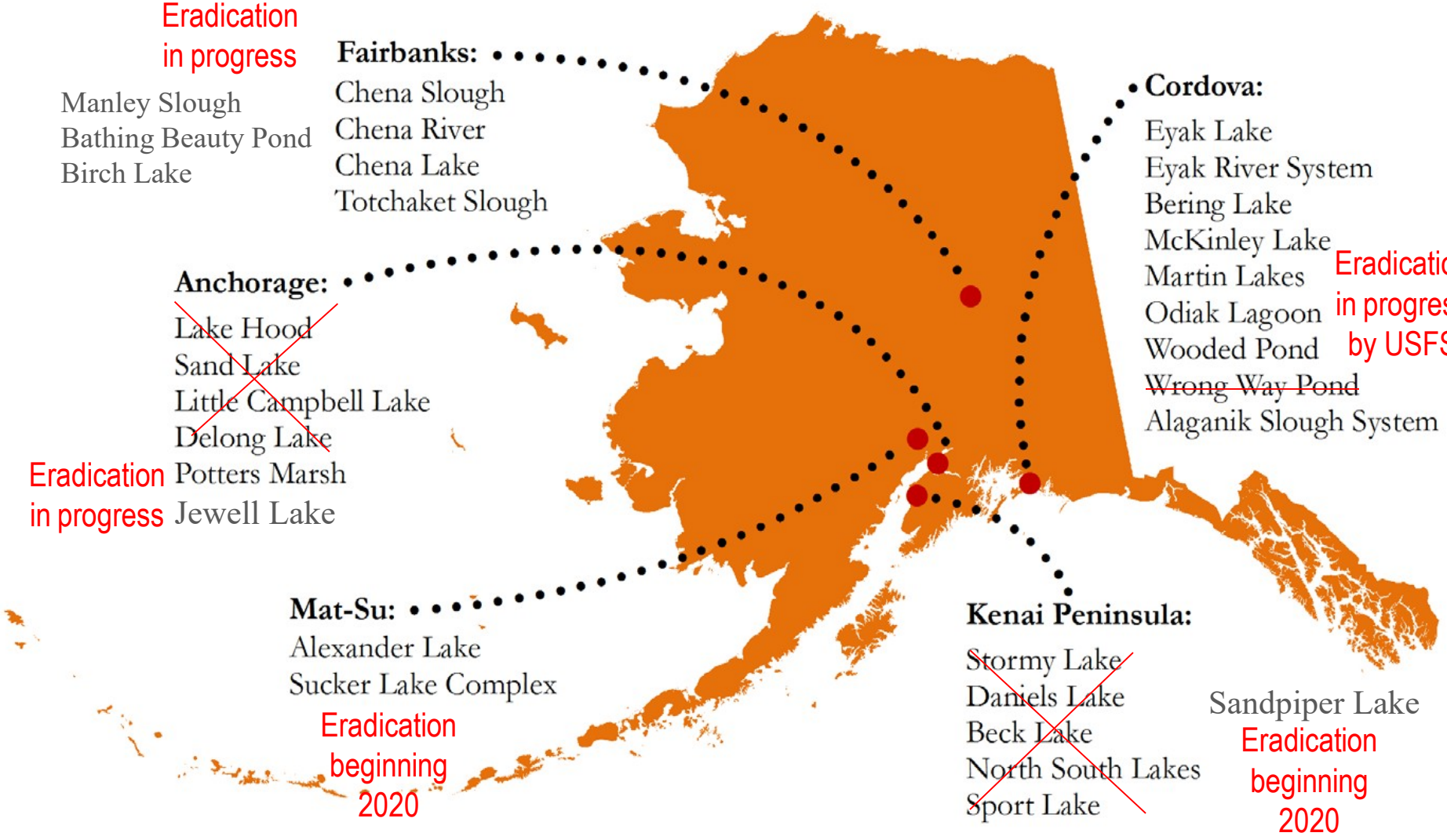


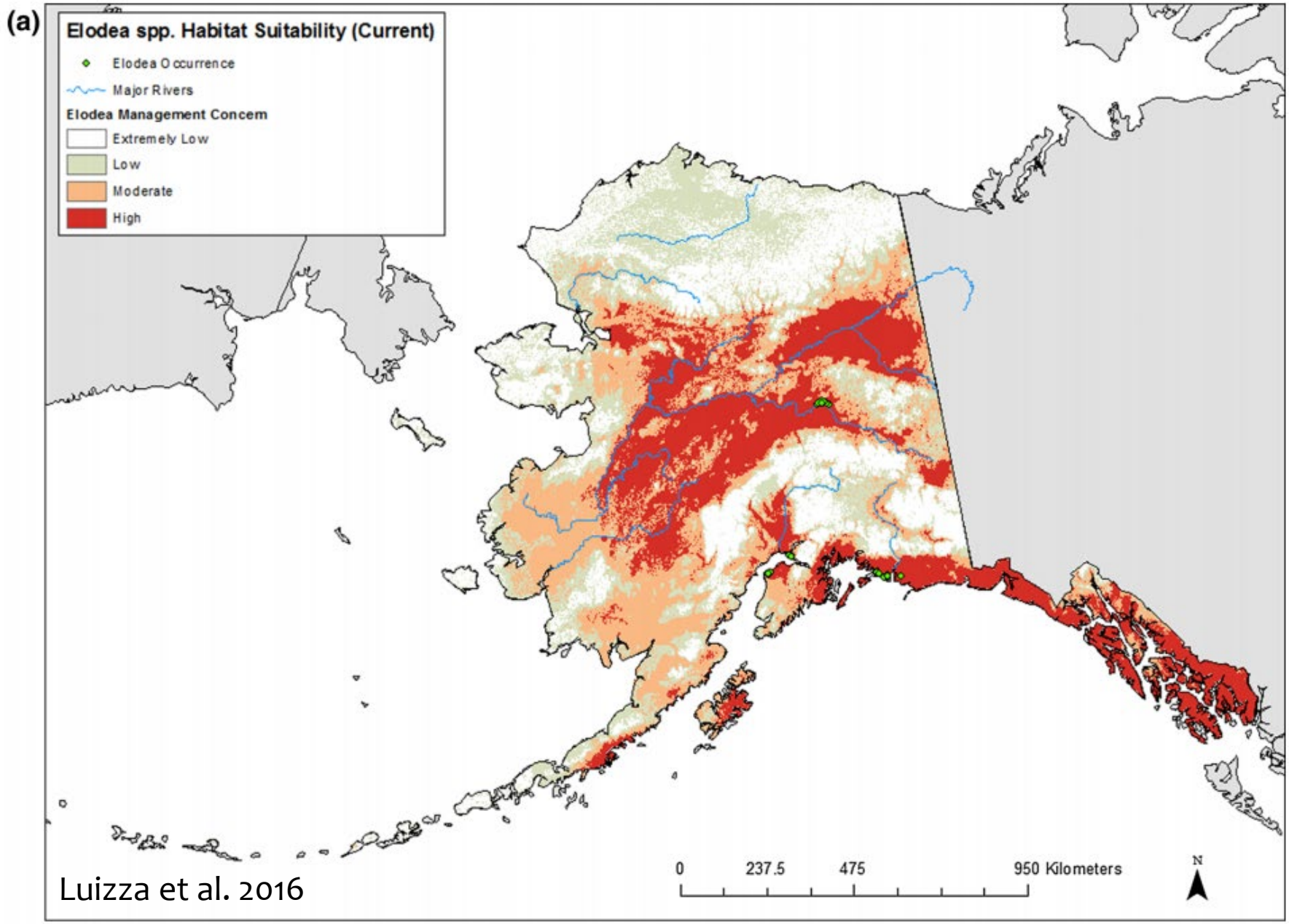
- Economic analysis:
  - Elodea impacts in Alaska: Mean annual loss of $159M to the sockeye salmon fisheries in Alaska if not stopped (Schwoerer et al 2019).
  - Ship-borne AIS impacts in the Great Lakes: Median annual cumulative loss of $138M/year to sportfishing, commercial fishing and water use. (Rothlisberger et al 2019).

Photo credit: Jason Ching

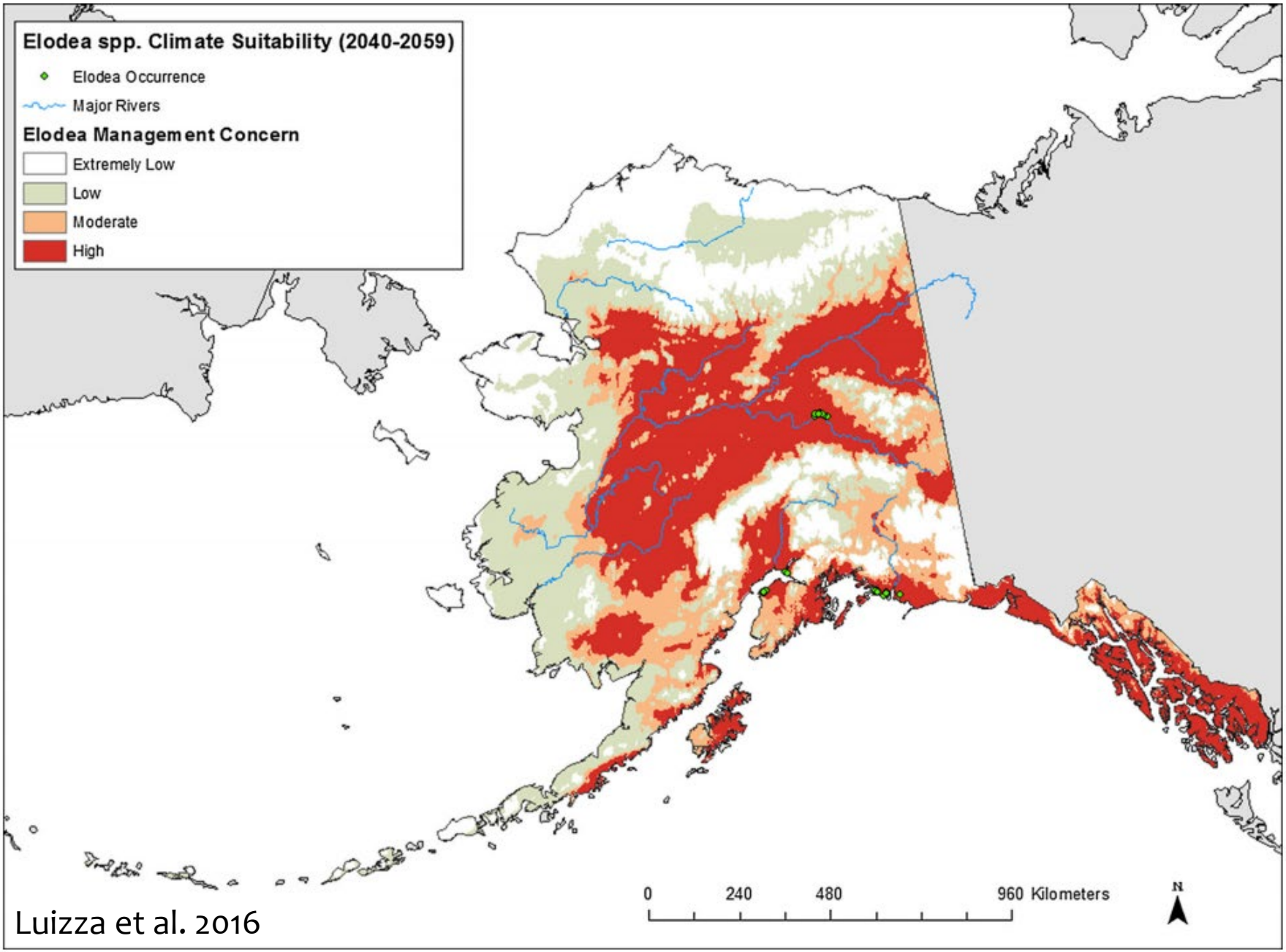
Photo credit: USFWS

Known Elodea Infestations in Alaska





Luizza et al. 2016

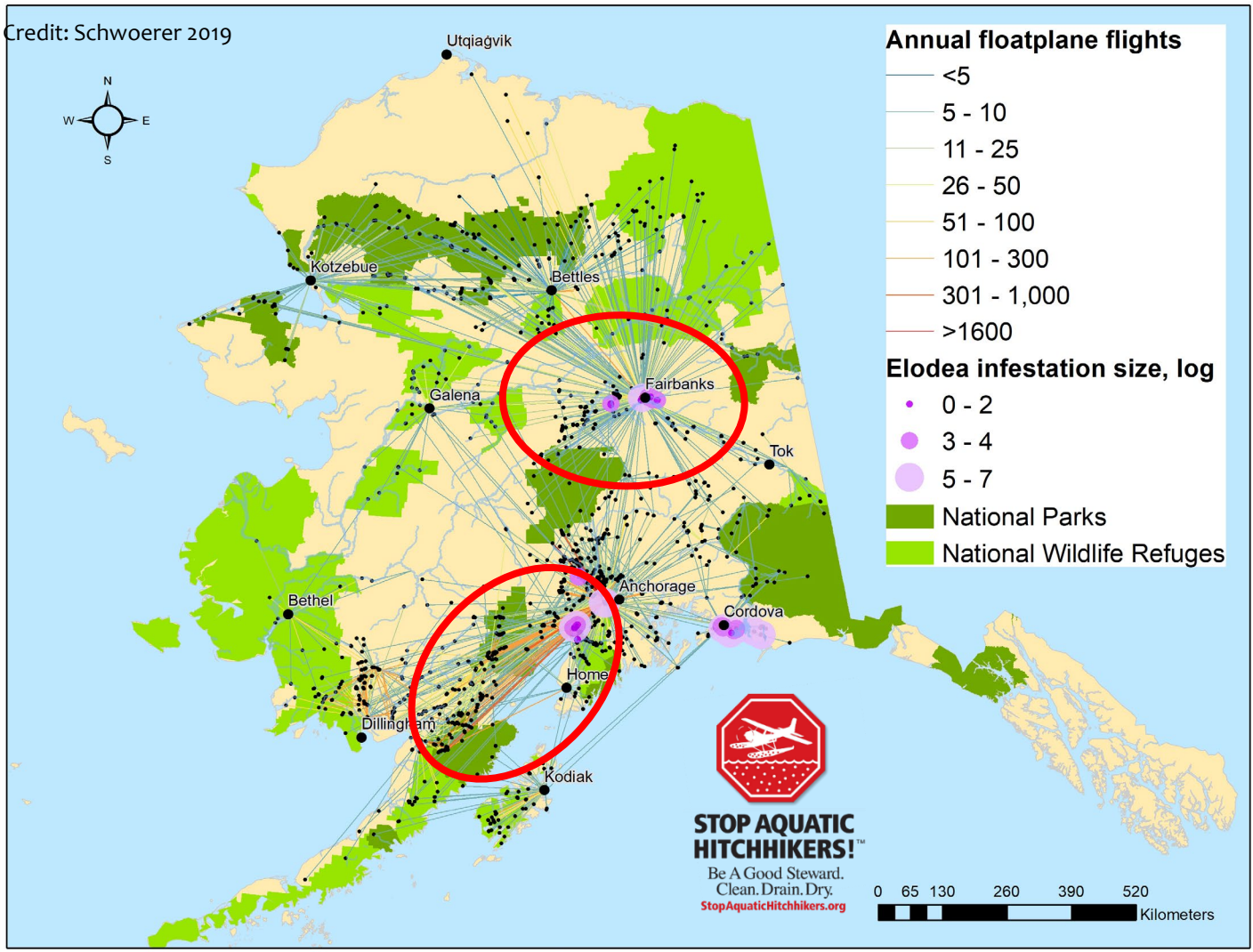


Luizza et al. 2016

Freshwater Vectors – *Floatplanes*

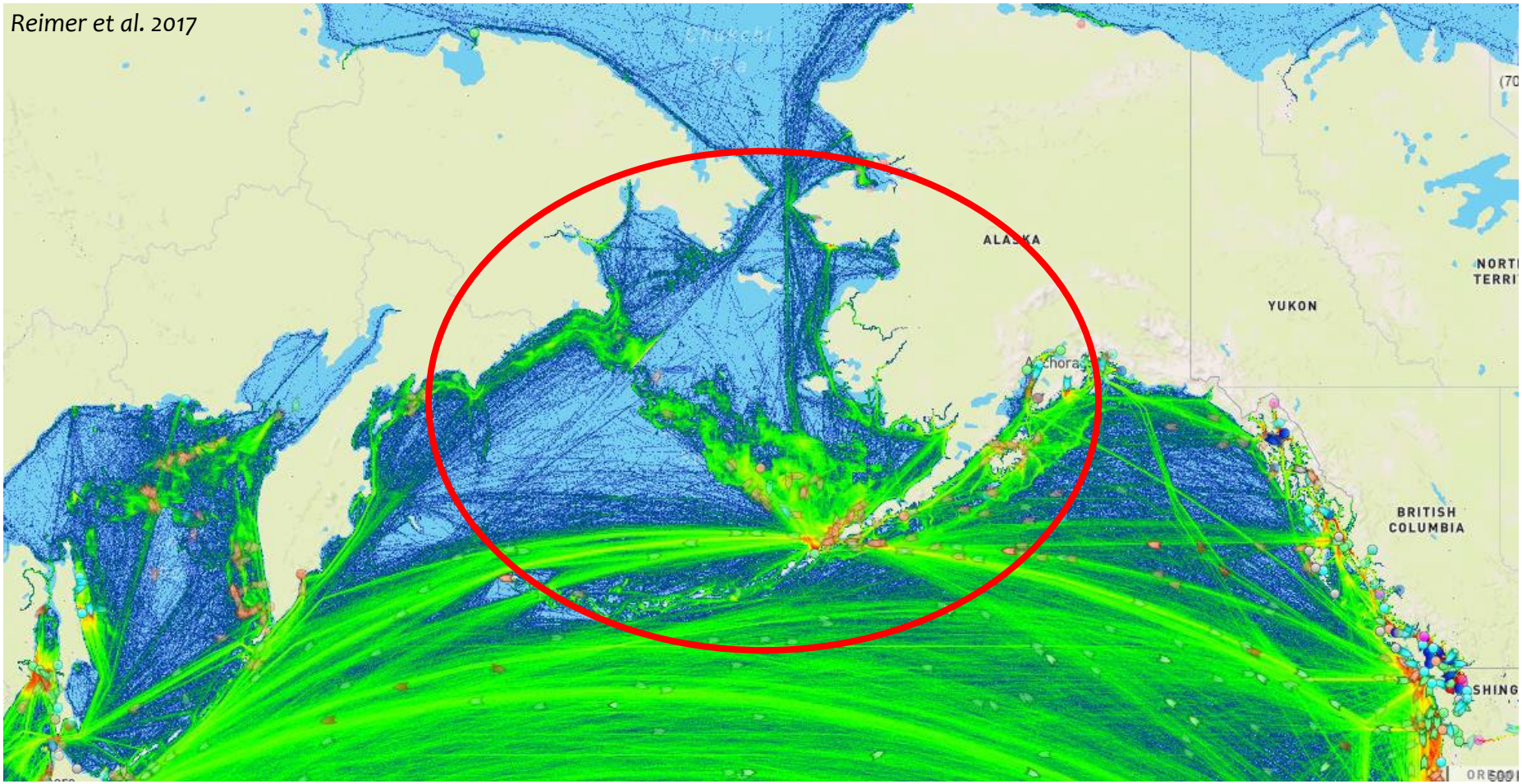
Floatplanes' first-leg flight paths between freshwater start and destination locations. Data from a survey with pilots about their 2015 flights. Schwoerer et al. 2017.

Elodea canadensis



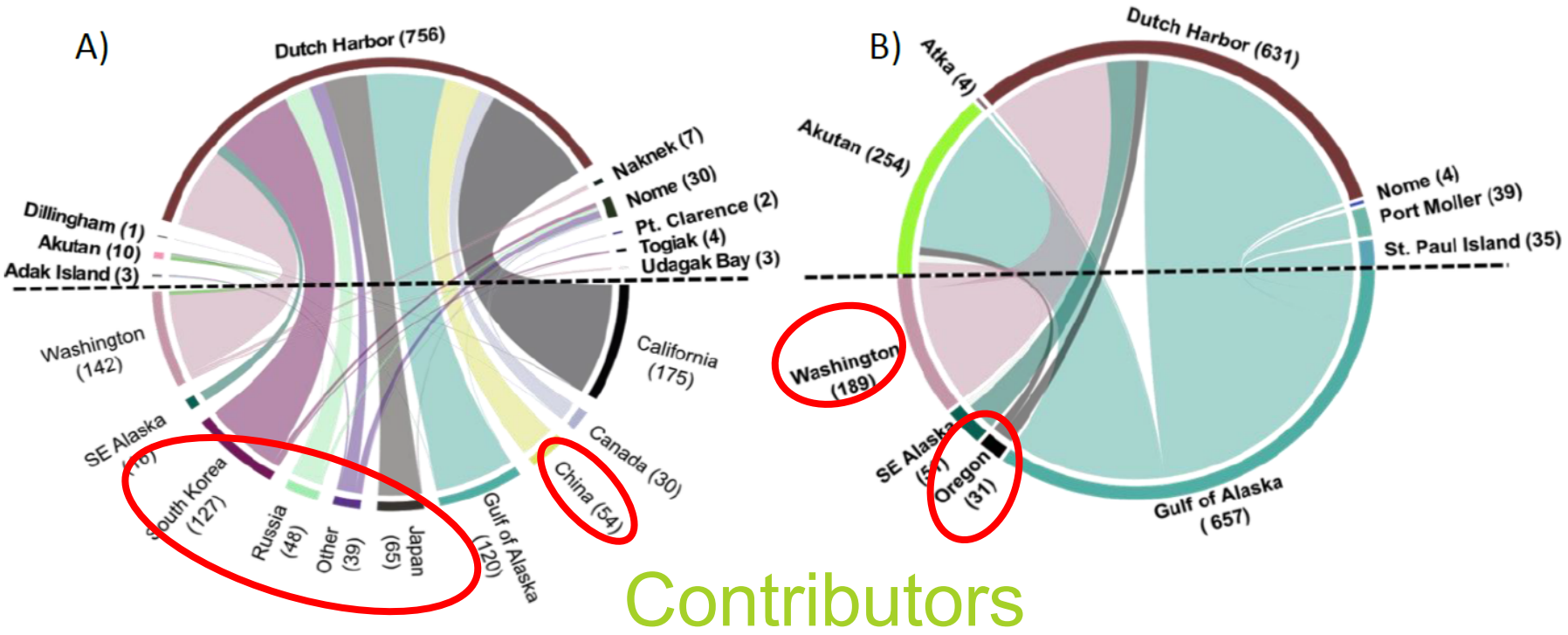
Marine Vectors

Commercial boating traffic in the North Pacific (2015).



Marine Vectors – Bering Sea

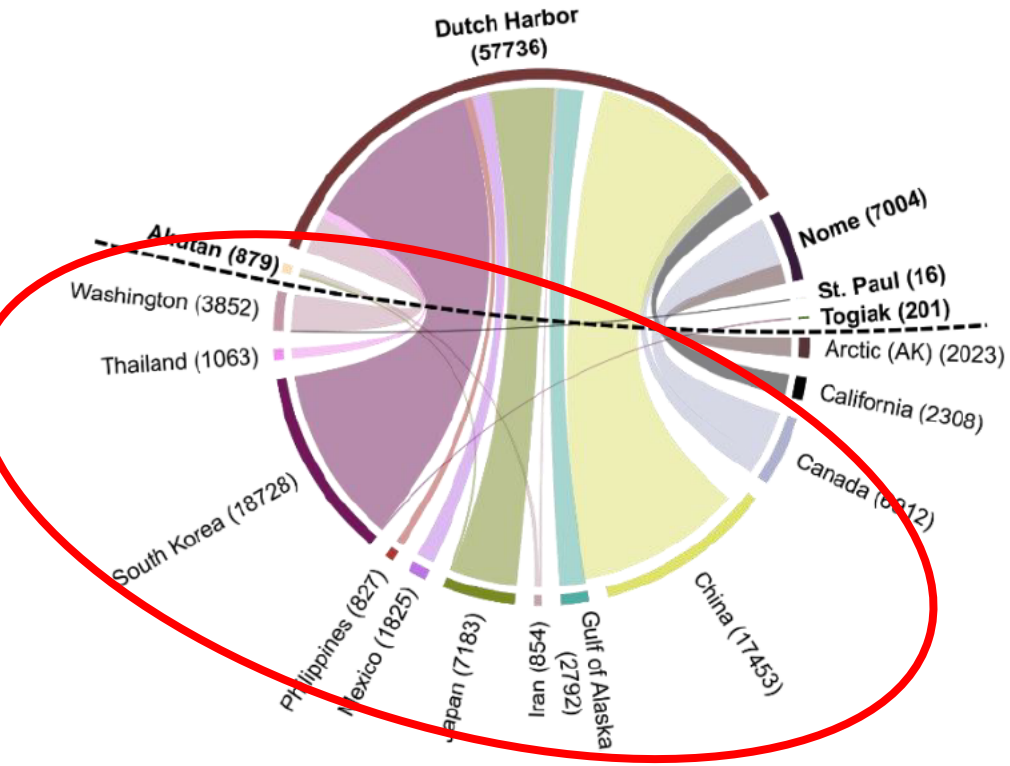
Reimer et al. 2017



Transit origins outside of the Bering Sea and the Bering Sea destination, 2014-2016 for A) all marine vessels and B) commercial fishing vessels. Reimer et al. 2017

Marine Vectors – Bering Sea

Reimer et al. 2017



Receivers

Contributors

Volume of ballast water (metric tons) discharged to Alaska ports in the Bering Sea and the vessels' region of origin. Reimer et al. 2017

European Green Crabs (*Carcinus maenas*):

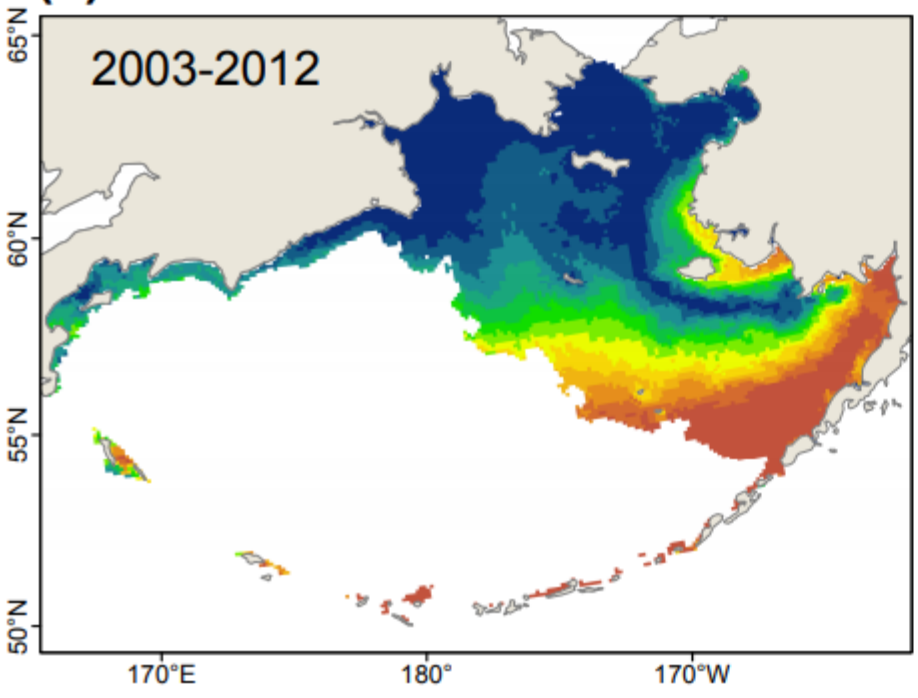
Limited reproductive habitat (Requires 6-9 weeks)

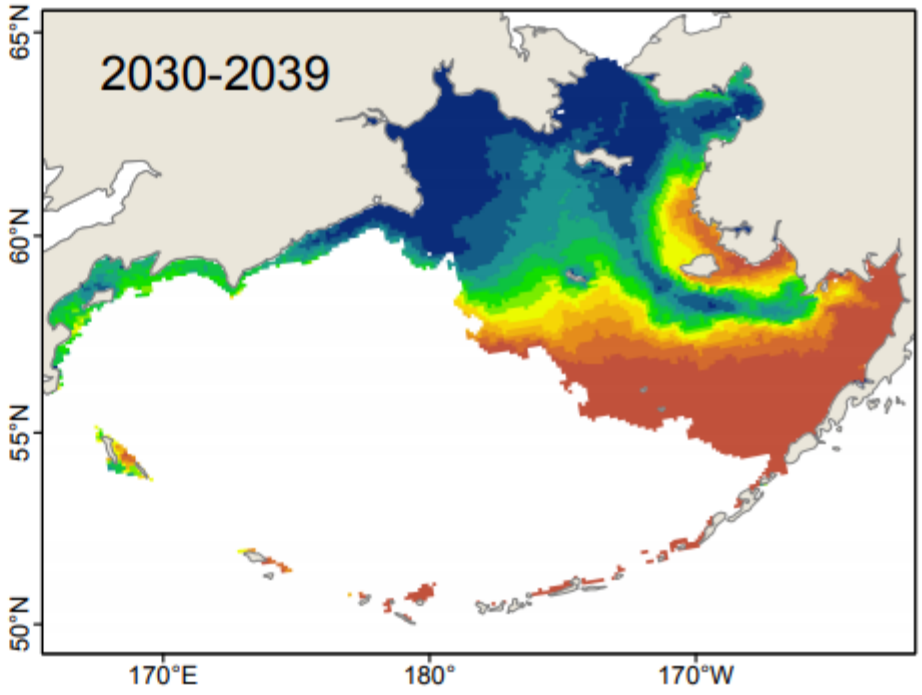
Carcinus maenas: Reproduction

Average number of consecutive weeks of suitable habitat

0 1 2 3 4 5 6 7 8 9 10 11 12

(a) Model: CGCM3-t47





Alaska Invasive Species Partnership

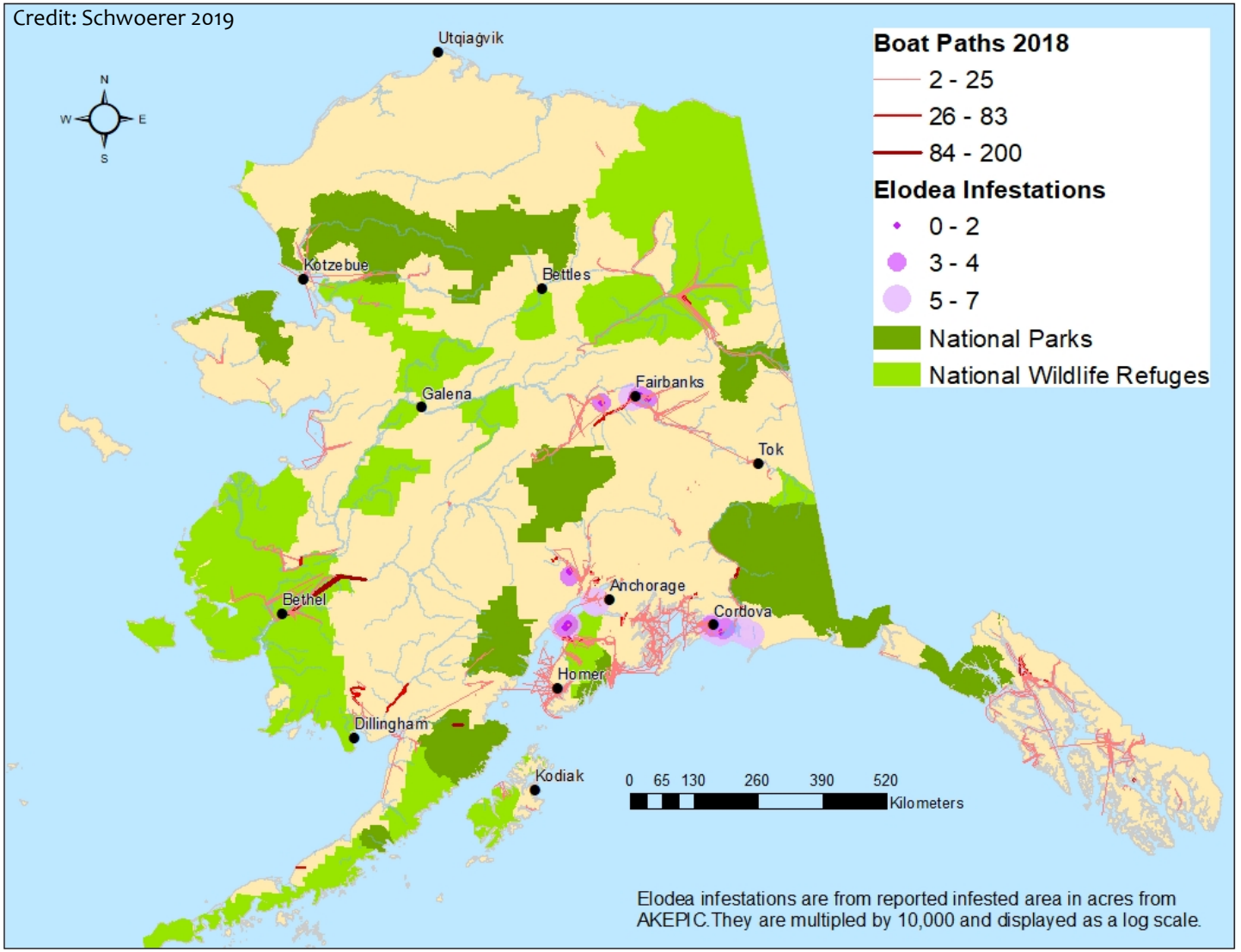
Annual Workshop Tentative Dates:
September 22-24, 2020

Anchorage, Alaska

https://www.uaf.edu/ces/invasives

Freshwater Vectors – *Watercraft*

Results of year one pilot work assessing watercraft travel destinations and frequency within Alaskan waterways, 2018. T. Schwoerer 2019.



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