KANSAS Aquatic Nuisance Species

Kansas Department of Wildlife, Parks and Tourism

CLEAN. DRAIN. DRY.
Every lake, every time.
ProtectKSWaters.org

Chris Steffen
Aquatic Nuisance Species Coordinator
Kansas Department of Wildlife, Parks, and Tourism

Outline

- What are Aquatic Nuisance Species (ANS)?
  - How do they spread?
- Generalized ANS impacts
- KDWPT ANS program
- ANS in Kansas - where are they and specific impacts
- Emerging ANS concerns
- Future KDWPT ANS program activities and opportunities

ANS background

- **What are ANS (or AIS)**
  - Federal definition: nonindigenous species that threaten the diversity or abundance of native species or the ecological stability of infested waters, or commercial, agricultural, aquacultural or recreational activities dependent on such waters
  - More simply: Non-native species that threaten the water resources of Kansas
  - **"Biological Pollution"**
- **Federal Legislation that guides ANS/AIS activities**
  - Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990
  - National Invasive Species Act of 1996
- **Kansas ANS plan approved by governor in 2005**
  - ANS Coordinator position created in 2007
  - Emerging field, not all states have an ANS coordinator (about 10 states do not)

How do ANS spread?

- ANYONE or ANYTHING moving water, mud, animals or vegetation between waterbodies is at risk of spreading ANS
- *Some* examples:
  - Ballast water in large ships
  - Interbasin transfers
  - Boats/trailers
  - Bait buckets
  - Fire suppression equipment
  - Construction equipment
  - Irrigation systems
  - “Pet” releases
  - Seaplanes
  - Raw water line repair equipment

Ecological/Recreational Impacts

- Disrupt balance of ecosystems
  - Invasive species don't have to cope with the predators or diseases from their native range
- Declines in native species
  - 50+% of threatened or endangered species are directly impacted by invasive species
- Loss of habitat
  - Decreased sportfish and wildlife populations – decreased fishing/hunting opportunity
- Decreased recreation at waterbodies
  - Reduce usable acres of water
  - Clog boat motors
  - No longer able to comfortably swimming – Have caused human deaths!!!

Economic Impacts

- World wide invasive species impacts are $137,000,000,000 (5% of global economy)
- Severely impact power plant and water treatment plant operation
  - Clog raw water intake screens/line
  - Clog cooling lines
- Irrigation/water supply issues
  - Prevent or slow water flow in irrigation ditches
  - Reduce capacity of ponds/lagoons and cause premature siltation
- These “hidden” costs of ANS are passed on to residents in:
  - Higher electricity bills
  - Higher water bills
- Lakeside property values diminished
  - Heavy/matted vegetation issues reduce values by around 16%

Impacts to People

Monroe County deputies rescue woman entangled in phragmites

Sheriff: Missing woman gets confused, falls in water near marina

By **Michelle Ganley** - Graham Media Group

Posted: 10:37 PM, June 16, 2017
Updated: 10:37 PM, June 16, 2017

Utah hunters safe after adventurous rescue

By Jasen Lee @JasenLee1
Published: December 25, 2018 8:00 am

5 Comm

1 of 3

ANS Program Background

- **Established 2005, governor endorsed program**
- **ANS Program Goals**
  - To **prevent new introductions** of ANS to Kansas
  - To **prevent dispersal** of established populations of ANS into uninfested waters of Kansas
  - To **eradicate or control** to minimize the adverse ecological, economic, social, and public health effects of ANS in an environmentally sound manner
  - To **educate** all aquatic users of ANS risks and how to reduce the harmful impacts
  - To **support research** on ANS in Kansas, and develop systems to disseminate information
- **$240,000 from license sales - hunters and anglers**
- **~$40,000 from USFWS grant**

Some ANS Program Activities

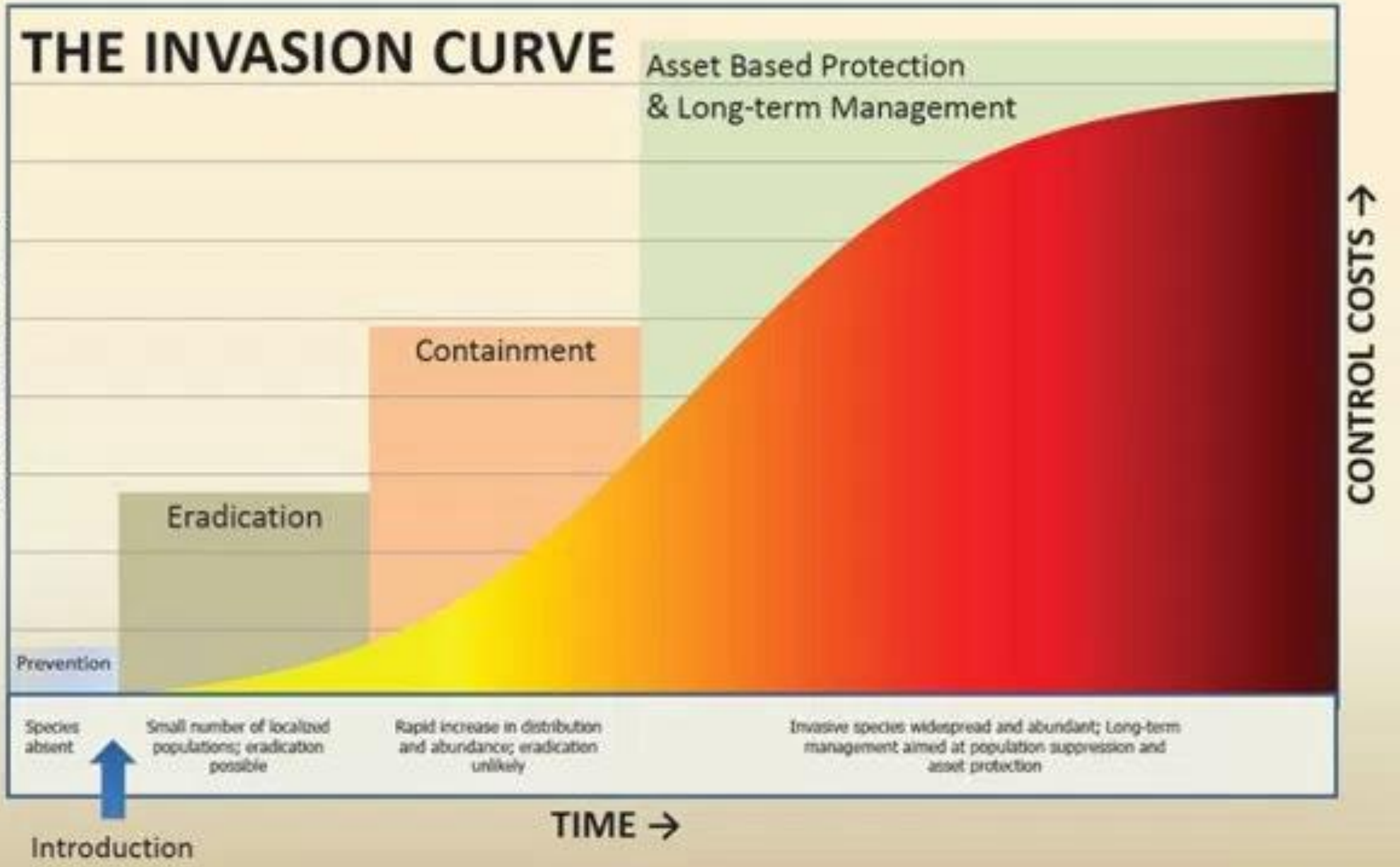
- Coordinate with regional and national partners in both state and federal government on developments in emerging ANS concerns, management and control options, funding opportunities, and research needs
- Conduct or fund research projects pertinent to KS ANS needs
- 200+ bait shops visited on a rotating basis to verify that only permitted species are being sold
- ~110 lakes statewide sampled for zebra mussel detection
- Work with other fisheries staff to facilitate fish health testing at all state fish hatcheries, Percid brood-stock waters, and private fish suppliers
- Outreach and Education efforts
  - Signage at waterbodies, radio ads, press releases, Facebook ads, brochures, displays, presentations and trainings, mailings, etc.
- Watercraft Inspection and Decontamination – New for 2020

U.S. FISH & WILDLIFE SERVICE
DEPARTMENT OF THE INTERIOR

MRBP
The MISSISSIPPI RIVER BASIN PANEL On AQUATIC NUISANCE SPECIES

The Western Regional Panel
On Aquatic Nuisance Species

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION


THE INVASION CURVE
Asset Based Protection
& Long-term Management
Containment
Eradication
Prevention
AREA INFESTED →
CONTROL COSTS →
Species absent
Small number of localized populations; eradication possible
Rapid increase in distribution and abundance; eradication unlikely
Invasive species widespread and abundant; Long-term management aimed at population suppression and asset protection
Introduction
TIME →

Aquatic Invasive Plant Control Programs in Other States

- Texas: recently increased annual ANS funding from $1.1 million to $6.3 million, largely for control of Giant Salvinia (17,000+ acres affected/treated)
- Missouri: $250,000 per year, just for Hydrilla
- Iowa: annually monitors 60 lakes and treats 35 lakes at cost of about $30k in chemical per year
  - Focus is eradication of Eurasian watermilfoil, control of Brittle Naiad and maintaining fishing access in locations with curlyleaf pondweed
- KS: attempting to replicate the Iowa program:

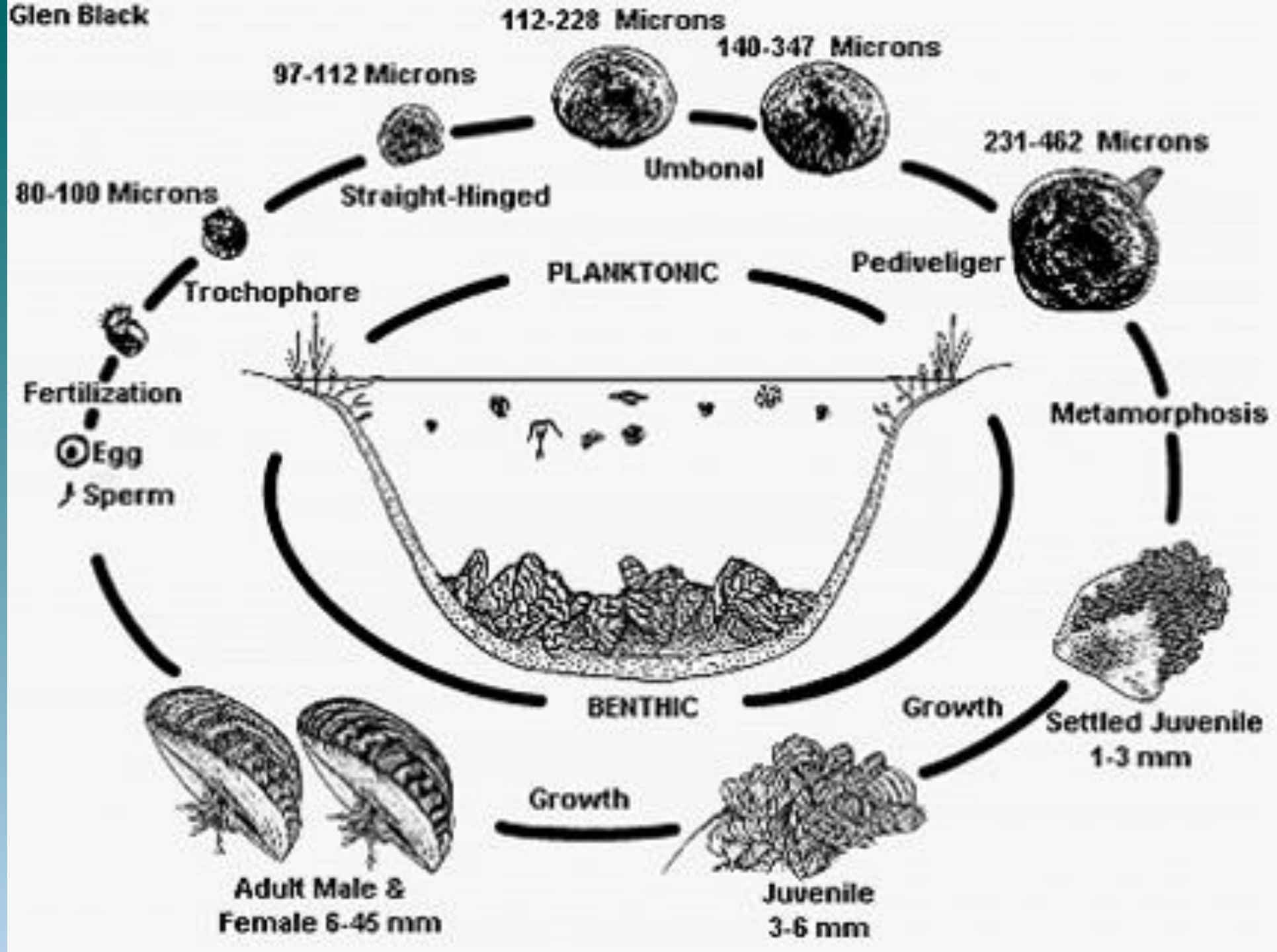
Prevention cost$$$ much less than management!!!

Priority Species

Zebra mussels

Native to the Black and Caspian seas

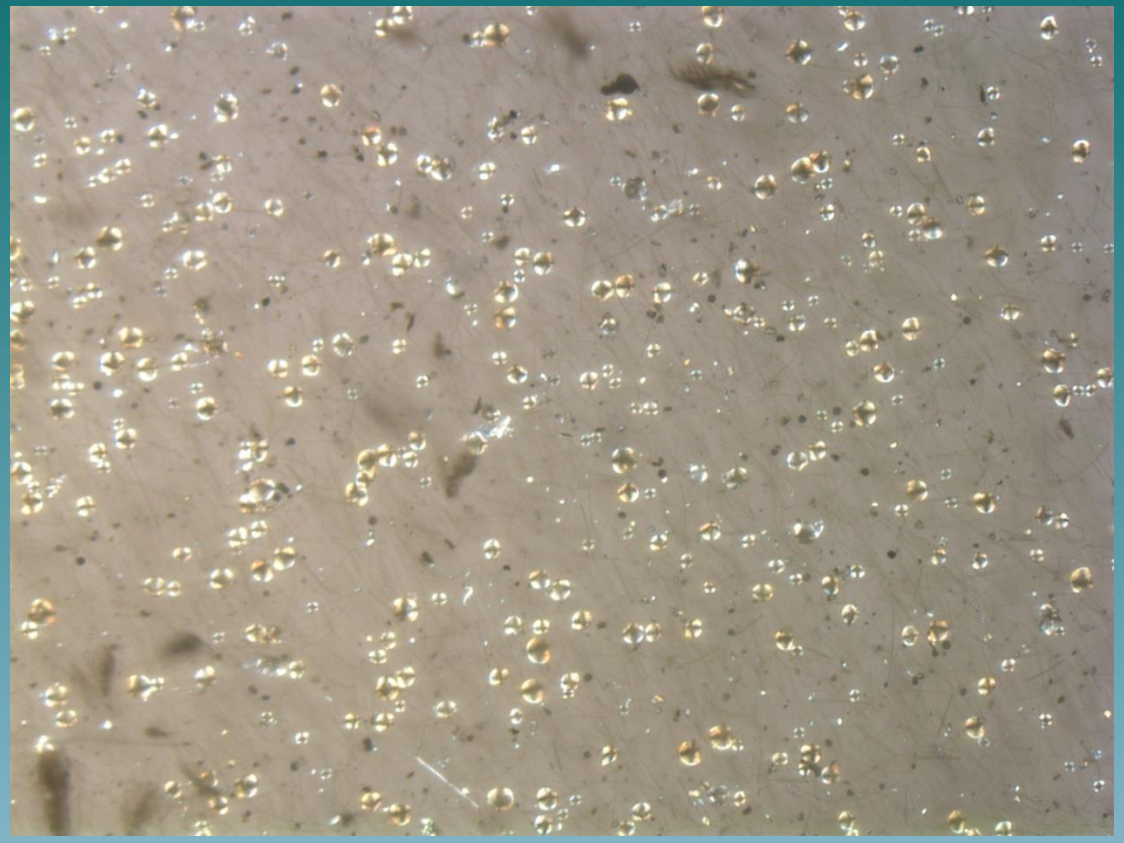
Arrived into the Great Lakes in 1986 in the ballast water of ships
First detected in lakes St. Clair and Erie in 1988


Glen Black
112-228 Microns
140-347 Microns
97-112 Microns
Umbonal
231-462 Microns
80-100 Microns
Straight-Hinged
Pediveliger
PLANKTONIC
Trochophore
Fertilization
Egg
Sperm
Metamorphosis
BENTHIC
Growth
Settled Juvenile
1-3 mm
Growth
Adult Male &
Female 6-45 mm
Juvenile
3-6 mm

Veligers

- Spawning normally begins at 54˚F
- Annually produce over 1 million eggs or 10 billion sperm
- Microscopic, free floating, 1,000 per gallon of infested lake water

Enlarged zebra mussel veliger

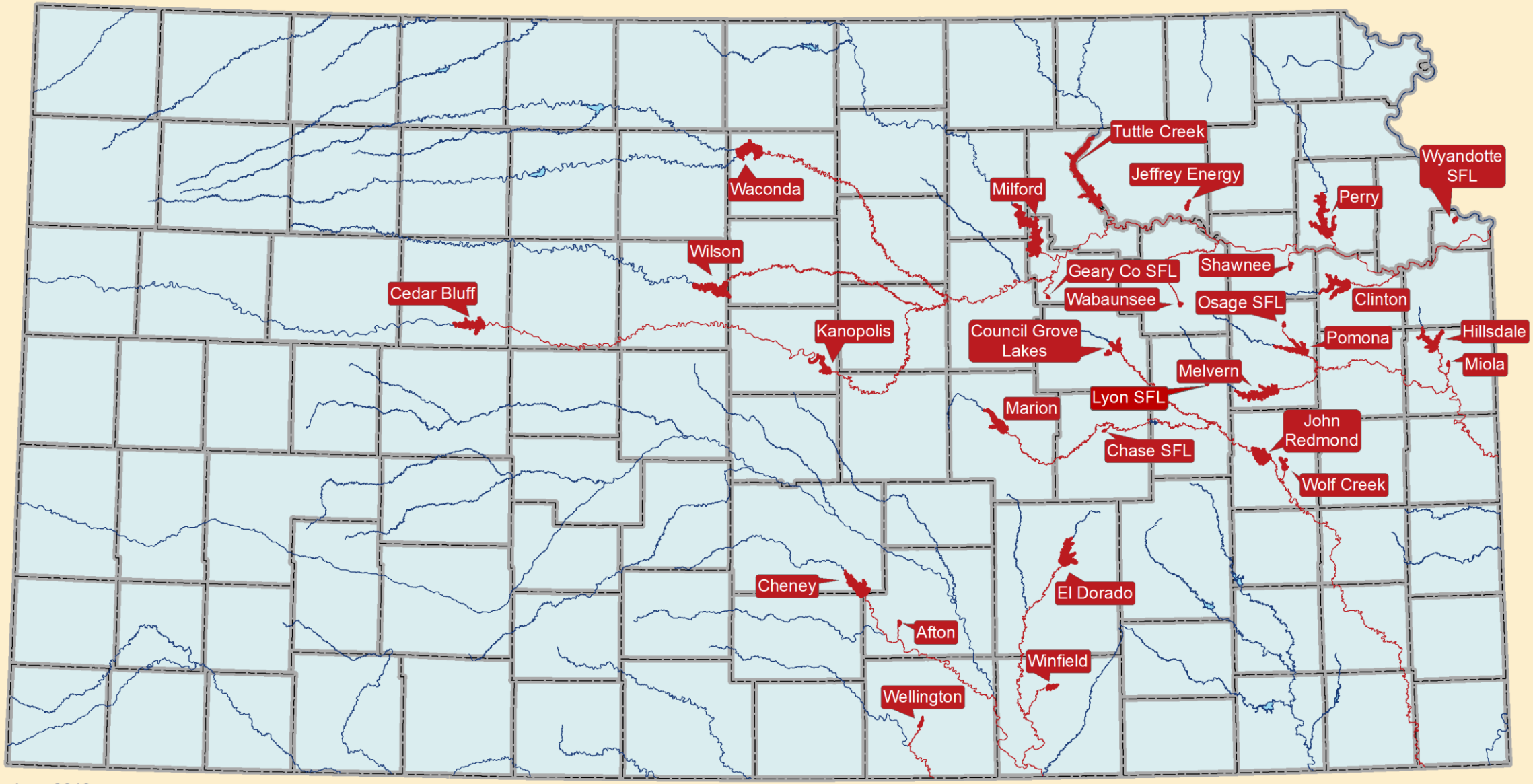


Picture of zebra mussel veligers under a cross-polarized microscope

Adults

- 6 to 45 mm (¼ to 1 ¾ inches)
- Live to be 2-3 years old
- Sexually mature at 8 mm
- Filter feed (filter up to 1 L/day)
- Firmly attach with byssal threads

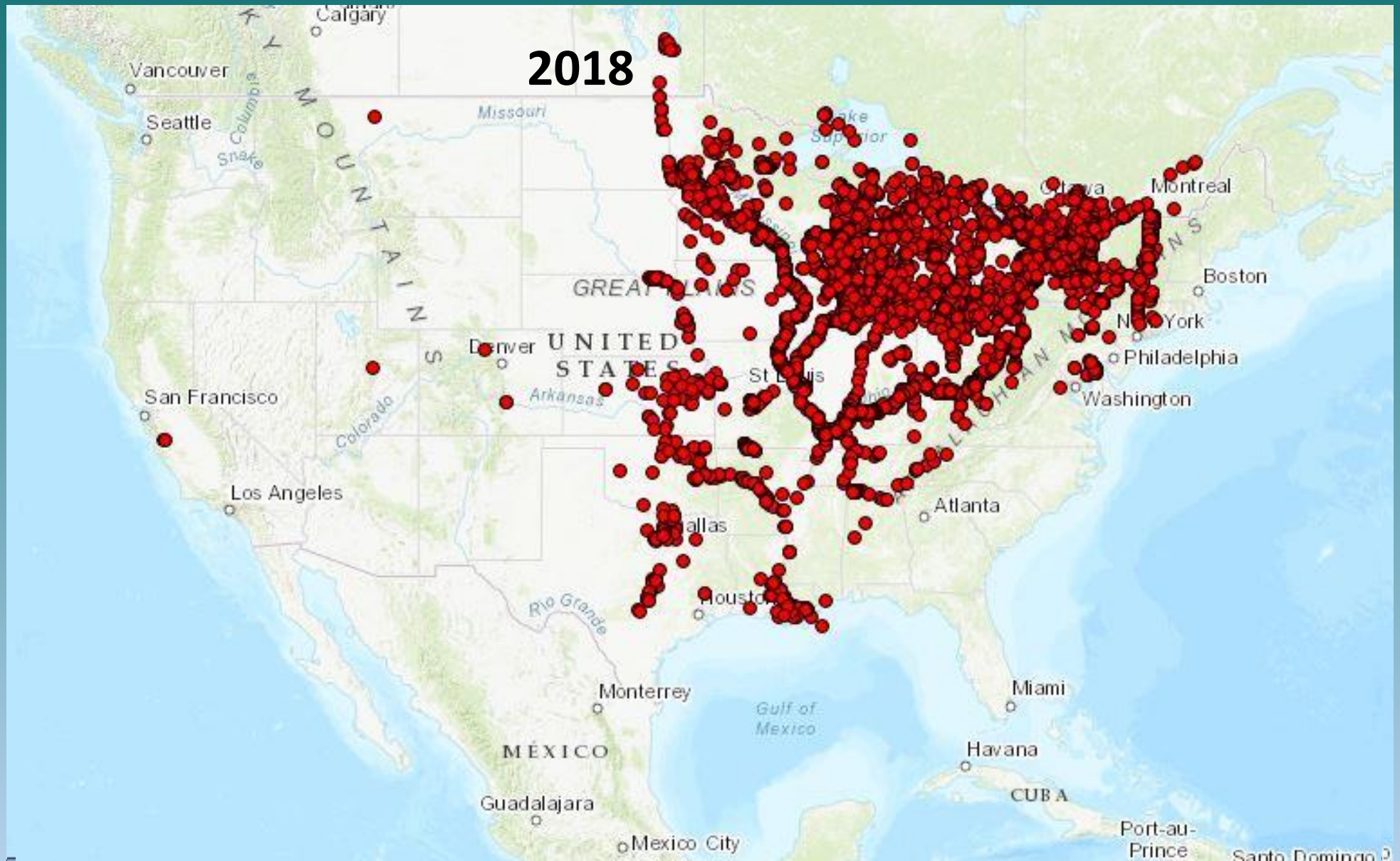
Status of Zebra Mussels in Kansas



June 2019

Infested River or Creek Infested Lake or Reservoir

Zebra Mussels - KS invasion timeline




El Dorado 2006

Impacts to Businesses

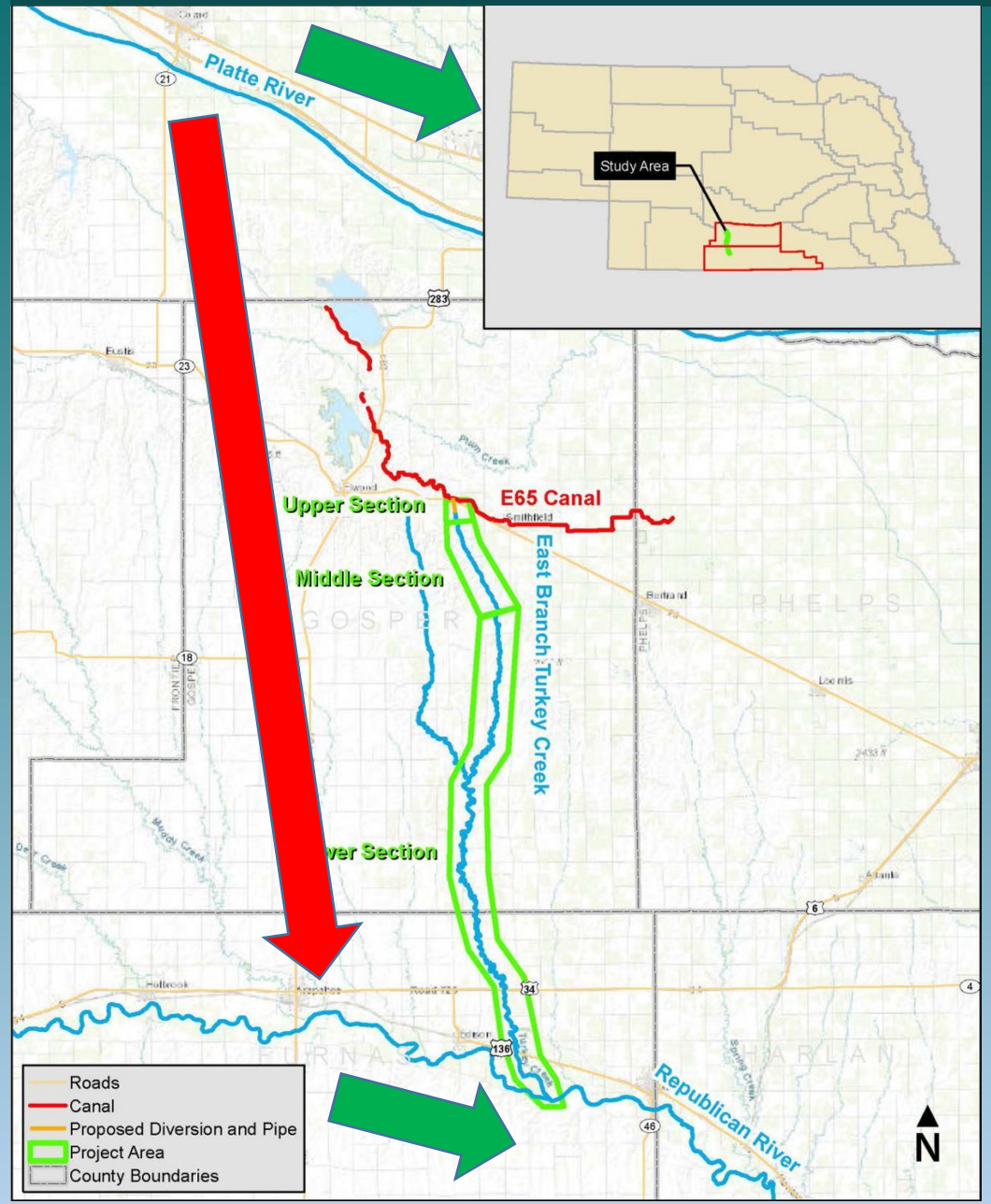
- Attachment
  - Expensive to prevent
  - Expensive to maintain
- Filter feeding
  - Contribute to harmful algal blooms (HABS)

Zebra/Quagga Mussel Economic Impacts

- Nationwide expenditures: $1 billion/yr.
  - Power generation: $145 million/yr.
- Kansas expenditures:
  - >$1.5 million/yr. in Neosho River Basin
  - El Dorado: ~$1.5 million set-up for zebra mussel control
  - Wichita: ~$2.2 million set-up for zebra mussel control
    - ~ $383,000/yr. increase in operation costs
  - Will have better overall economic impact estimate for KS next year

- In 2012, Council Grove and Osage City faced water supply issues due to zebra mussel clogged infrastructure

Proposed Platte-Republican Diversion



- Documented approximately 50 miles downstream from point diversion:
  - White Perch
  - Asian Carp

White Perch

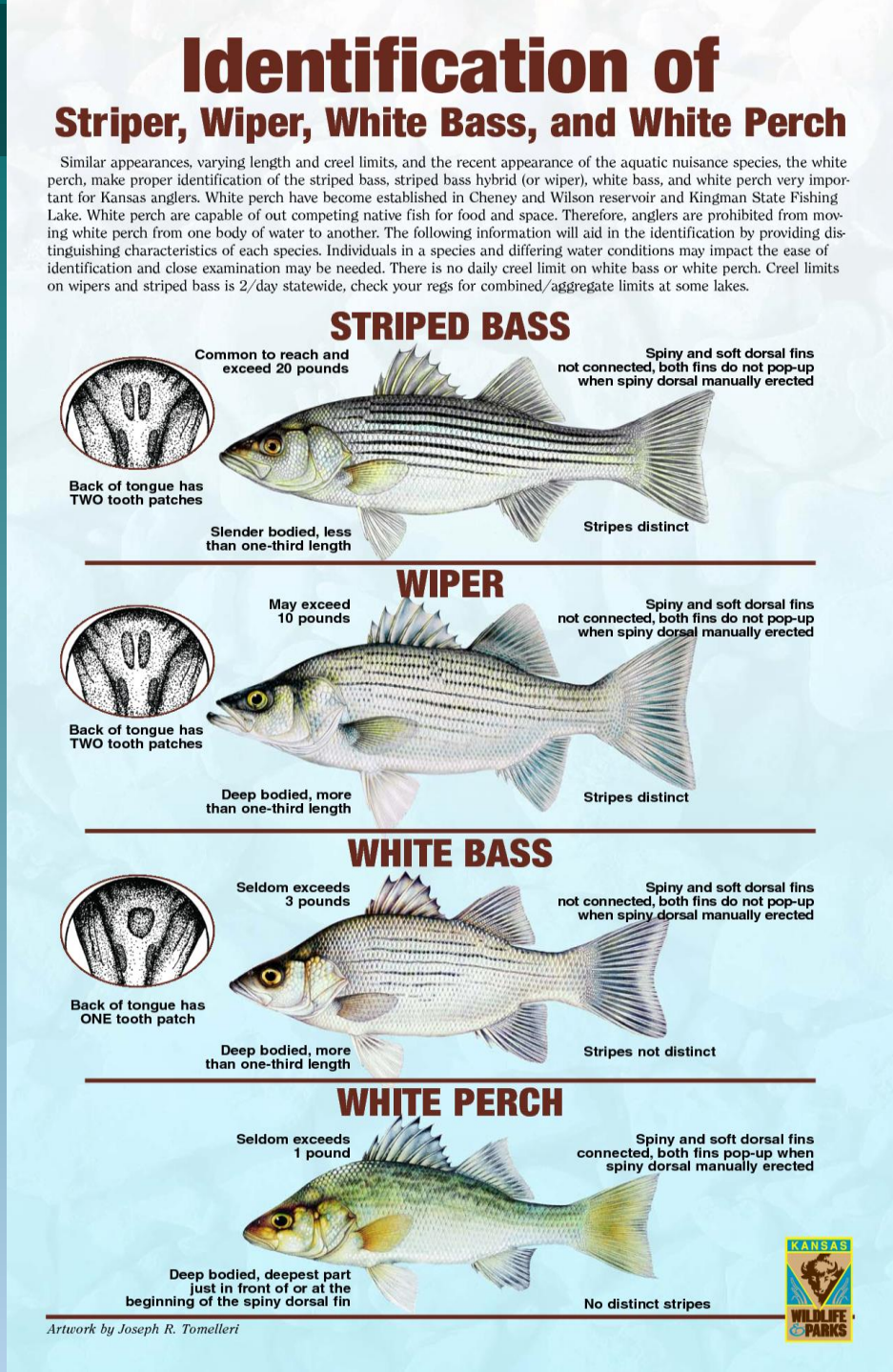
Morone americana

Map created on 6/19/2019. United States Geological Survey

- Wilson Reservoir
- Cheney Reservoir
- El Dorado Reservoir
- Several smaller lakes in Wichita area

White Perch

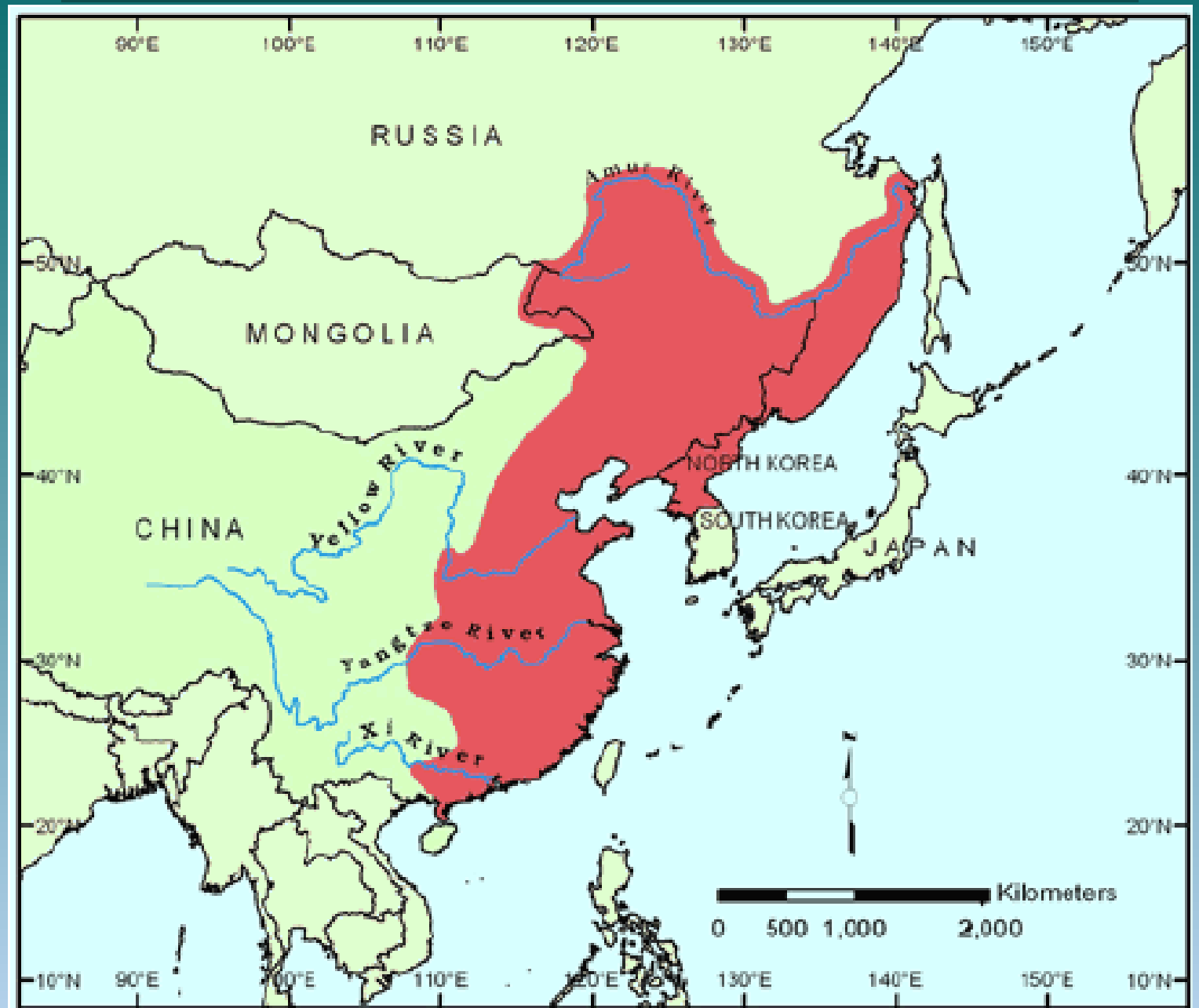
- Lead to declines of sportfish such as bass, crappie and walleye
  - In Cheney Reservoir, at one point White Perch comprised 95% of fish less than 8”
  - Feed heavily on baitfish utilized by other species
  - Also feed on eggs of other species, including sportfish
- Look like and hybridize with native White Bass



Priority Species

Asian carp

Native Range



Bighead Carp

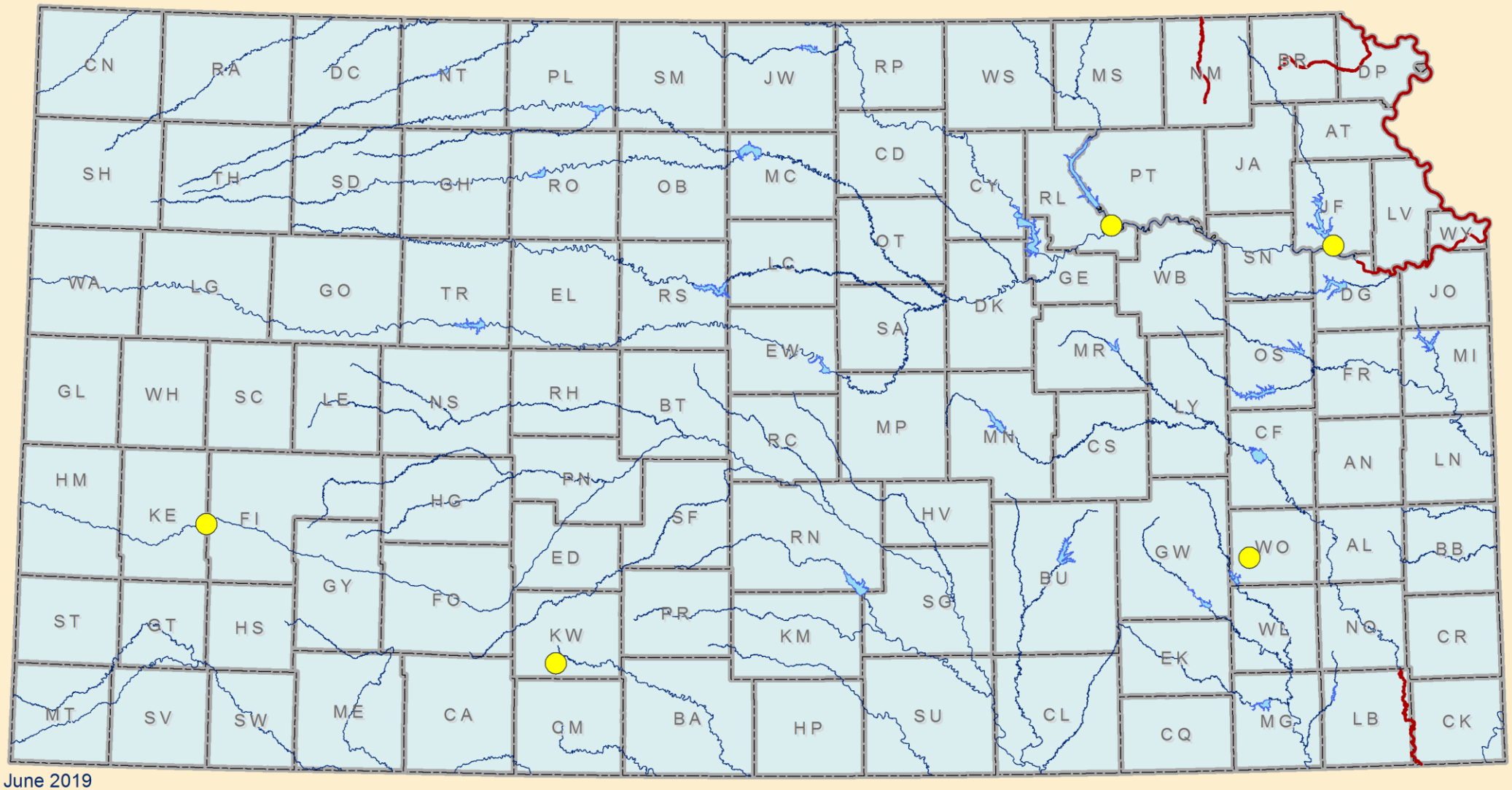
USGS
science for a changing world

Hypophthalmichthys nobi

Native HUCs
Non-native HUC 8 Level Record
Non-native non-specific State Record

Map created on 2/1/2020. United States Geological Survey

Status of Asian Carp in Kansas



June 2019

Isolated Collections Infested River or Creek

Kansas River 2012

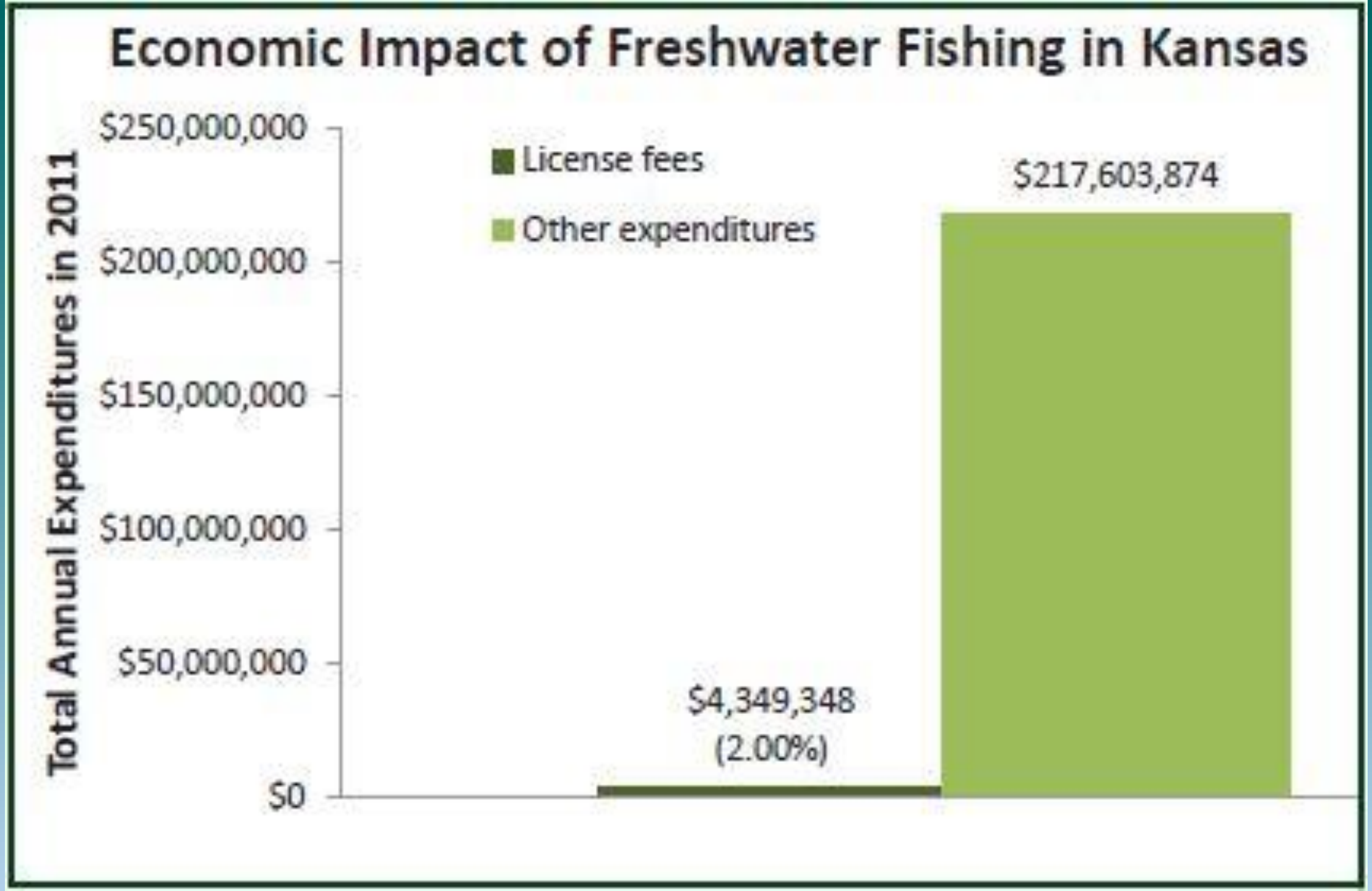

Before
After

Asian Carp Biology

- Up to 51 inches long and 110 pounds
- Mature at 2-7 y ears old, live up to 30 years
- Adults triggered to travel upstream and spawn by increased flows
- Tagged fish have been recorded traveling 39 miles in a single day
- In KS, spawning can occur April-October
- Each female can produce up to two million eggs per year
- Egg diameter is .055” (1.4mm)
- Eggs are neutrally buoyant and drift downstream 48-72 hours before hatching
- Both juveniles and adults eat zooplankton, the basis of the food chain

Asian Carp Impacts

- Lead to declines of sportfish such as bass, crappie and walleye
  - In other states, lakes with Asian Carp have experienced sportfish population reductions of 90-98%
- Recreation declines as Asian Carp populations increase
  - Kentucky and Barkley lakes have seen a huge decline (>50%) in the number of bass tournaments hosted at those lakes
    - Lake-focused tourism is a major economic driver in that area
  - Housing values also decline as recreation value declines


Economic Impact of Freshwater Fishing in Kansas
Total Annual Expenditures in 2011
$250,000,000
$200,000,000
$150,000,000
$100,000,000
$50,000,000
$0
License fees
Other expenditures
$217,603,874
$4,349,348
(2.00%)

Proposed Platte-Republican River Interbasin Water Transfer
- Fact Sheet -

- **This project could severely impact natural resources in Kansas**
- **Milford and Lovewell Reservoirs are downstream and are especially threatened by this project**

What is being proposed:

The Central Nebraska Public Power and Irrigation District is proposing to move water in Nebraska from the Platte River Basin to the Republican River Basin to meet their legal streamflow obligations to Kansas. However, downstream environmental and economic consequences should be considered.


Asian Carp jumping

Why this is a problem:

The Platte and Republican Rivers are not naturally connected. Connecting the two would create a pathway for harmful fish, plants, and other species to move between the rivers. The Platte River contains species such as Asian Carp and White Perch that could swim into the Republican River system, which supplies Lovewell and Milford Reservoirs. These species and others that may inhabit the Platte River in the future could severely impact our lakes and rivers. Asian Carp can weigh over 50lbs. and leap 10ft in the air when boats or personal watercraft pass by, posing a risk of serious injury to boaters. White Perch and Asian Carp also pose a risk to Kansas' $210,000,000 recreational fishing industry by leading to declines of sportfish such as bass, crappie and walleye. In other states, some lakes with Asian Carp have experienced sportfish population declines of more than 80%. Changes to the Republican River could impact critical habitat for the Shoal Chub and Plains Minnow which are threatened species in Kansas.

Here is how to comment on this project:

Submit written comments to: Department of Natural Resources, P.O. Box 94676, Lincoln, Nebraska 68509-4676. **Your written comments must be received by August 16, 2018.** Be sure to include:

1) The application number to which you are commenting on (A-19594)
2) An indication that your comment is offered under Option 1 (written comment)
3) Your name, address, and contact information
4) Your written comments

For more information on submitting your comments, see: A-19594 NOTICE.pdf at:
https://dnr.nebraska.gov/notice-interbasin-transfer-application-19594

Kansas
Department of Wildlife, Parks and Tourism

For more information:

Information about Asian Carp, White Perch and other harmful species can be found at ProtectKSwaters.org

Or contact:

Chris Steffen, Aquatic Nuisance Species Coordinator
620-342-0658 or chris.steffen@ks.gov

STATE OF KANSAS

CAPITOL BUILDING
ROOM 241 SOUTH
TOPEKA, KS 66612

PHONE: (785) 296-3232
FAX: (785) 368-8788
GOVERNOR.KS.GOV

GOVERNOR JEFF COLYER, M.D.

August 8, 2018

Mr. Jeff Fassett, Director
Nebraska Department of Natural Resources
P.O. Box 94676
Lincoln, Nebraska 68509-4676

Subject: Objection to Application A-19594, Option #1

Dear Director Fassett:

The state of Kansas objects to the Interbasin Transfer from the Platte River to the Republican River Basin. Application A-19594 was filed with the Department of Natural Resources on April 4, 2018 by the Central Nebraska Public Power and Irrigation District (CNPPID) and the Platte Republican Diversion Interlocal Agreement Partners. While the application states that no Adverse Impacts exist, the transfer will provide a pathway for invasive species of fish to enter the Republican River Basin where currently, no evidence of these species exists.

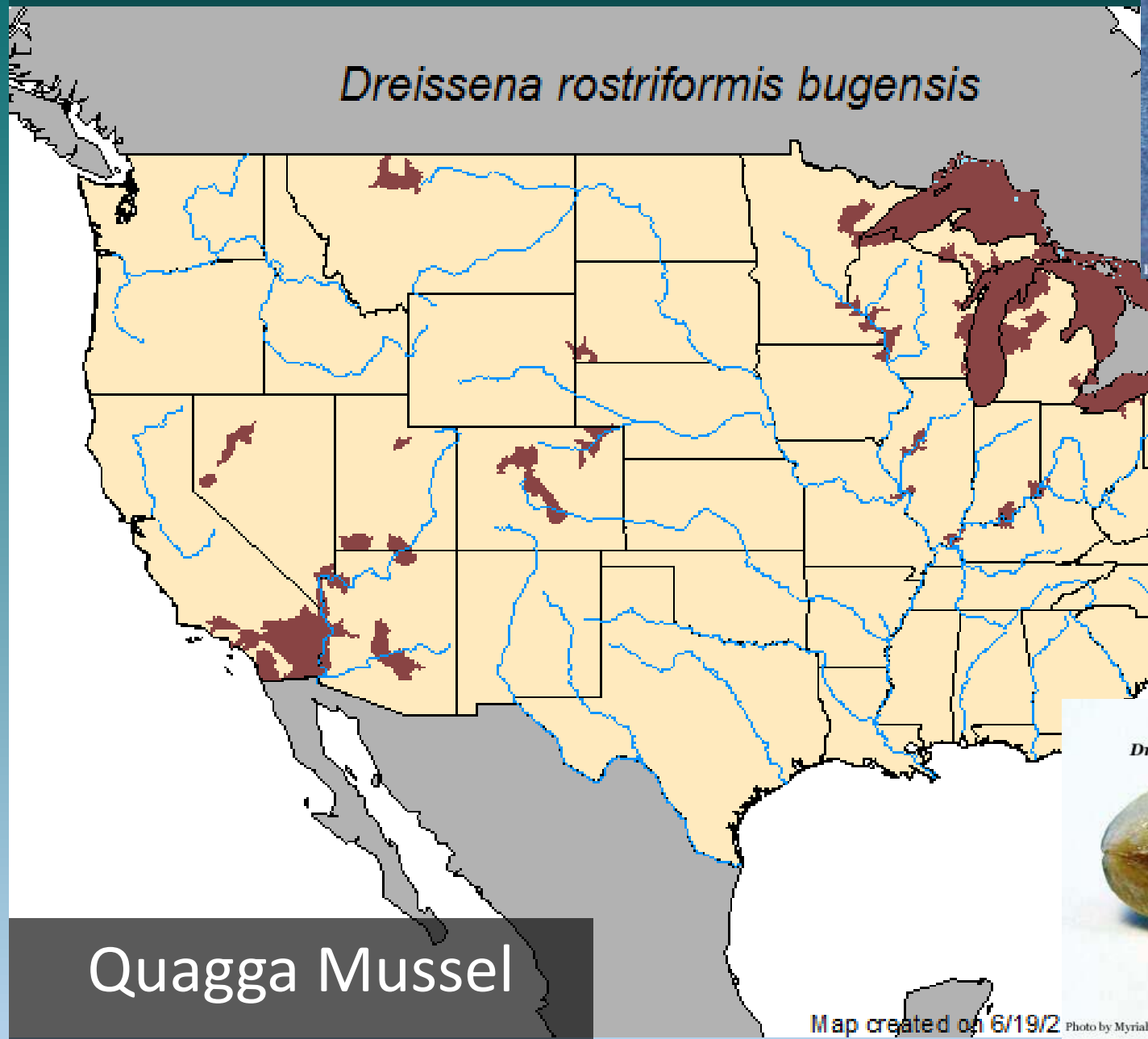
According to the Nebraska Department of Game and Parks, Asian carp (bighead and silver carp) have been documented over the past several years in the upper sections of the Loup, Platte and Elkhorn rivers. Numerous adults were sampled in 2017 in the Elkhorn and an overwintering population of both silver and bighead were documented in Turkey Creek (near Kearney, NE) which is a tributary of the Platte River which is the first documentation of an overwintering population in this area. The Department has also documented the existence of Asian Carp at the J2 return.

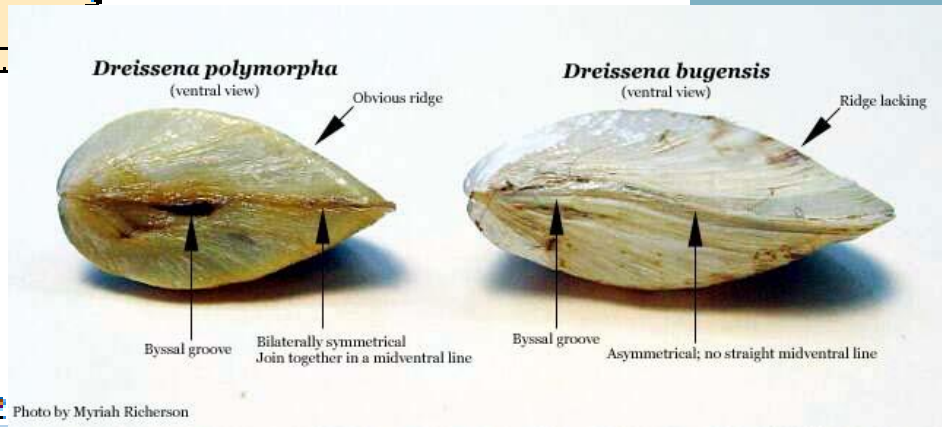
Asian carp have decimated sportfish populations and pose safety hazards to river and reservoir recreationalists in many parts of the United States, most recently at Barkley and Kentucky Lakes in Kentucky. Harlan County Reservoir would be impacted by the presence of these species as well as Lovewell and Milford Reservoirs in Kansas, and eventually, the upper Kansas River. Not only will species have a detrimental environmental effect on the Republican and Kansas River systems, but will have profound economic impact to the state of Kansas and local economies surrounding the reservoirs. The Kansas Republican River Compact Administration team has collaborated with the state of Nebraska to develop strategies providing greater water certainty for our water users and we support water supply strategies to insure compliance with the Compact. However, the invasive species implications to the Republican River resulting from the Platte River transfer proposal prohibit Kansas from supporting its' permit approval. For these reasons, I recommend that Application A-19594 be denied.

Sincerely,

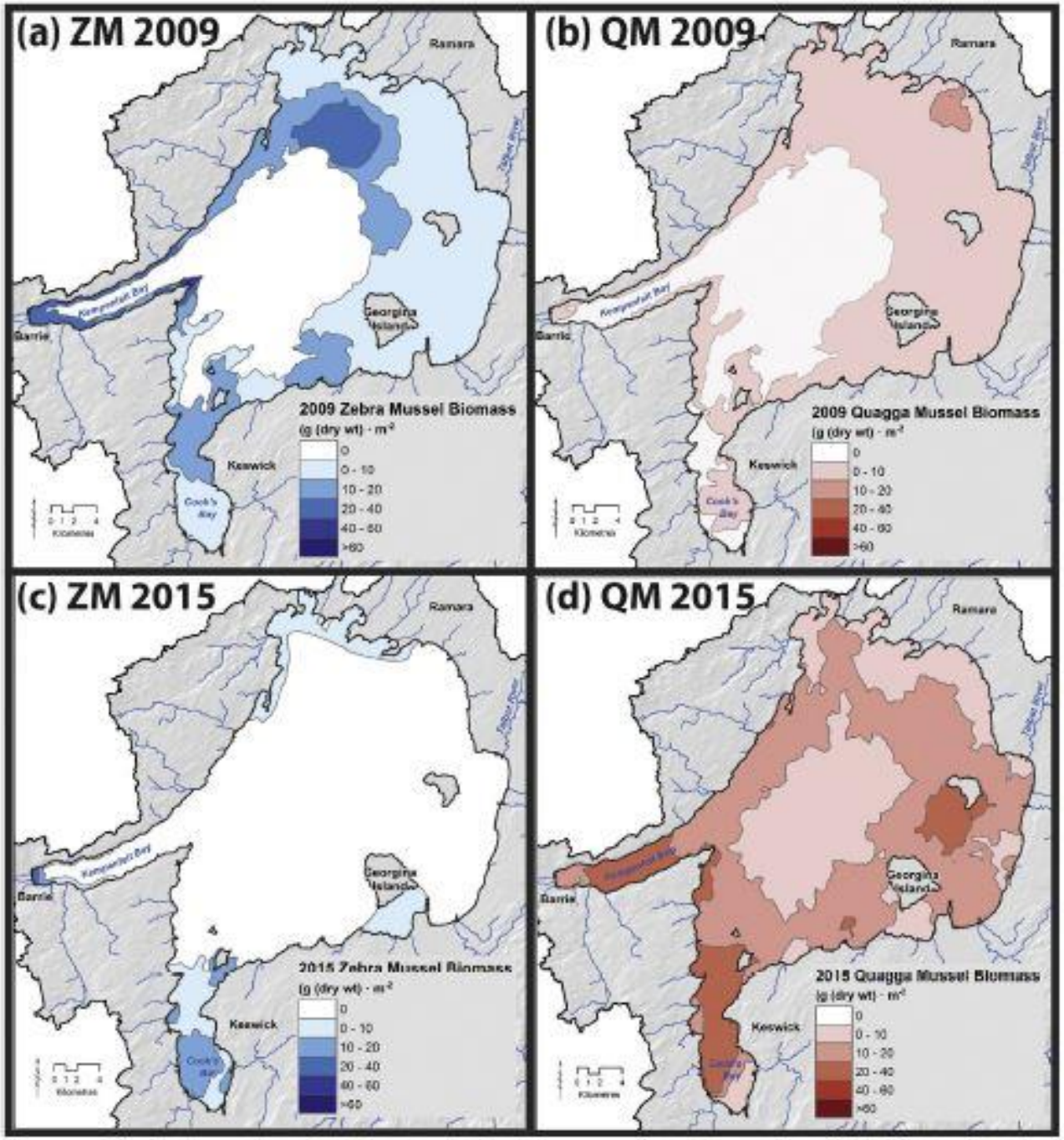
Jeff Colyer, M.D.
Governor

Other ANS of Concern





Quagga Mussel

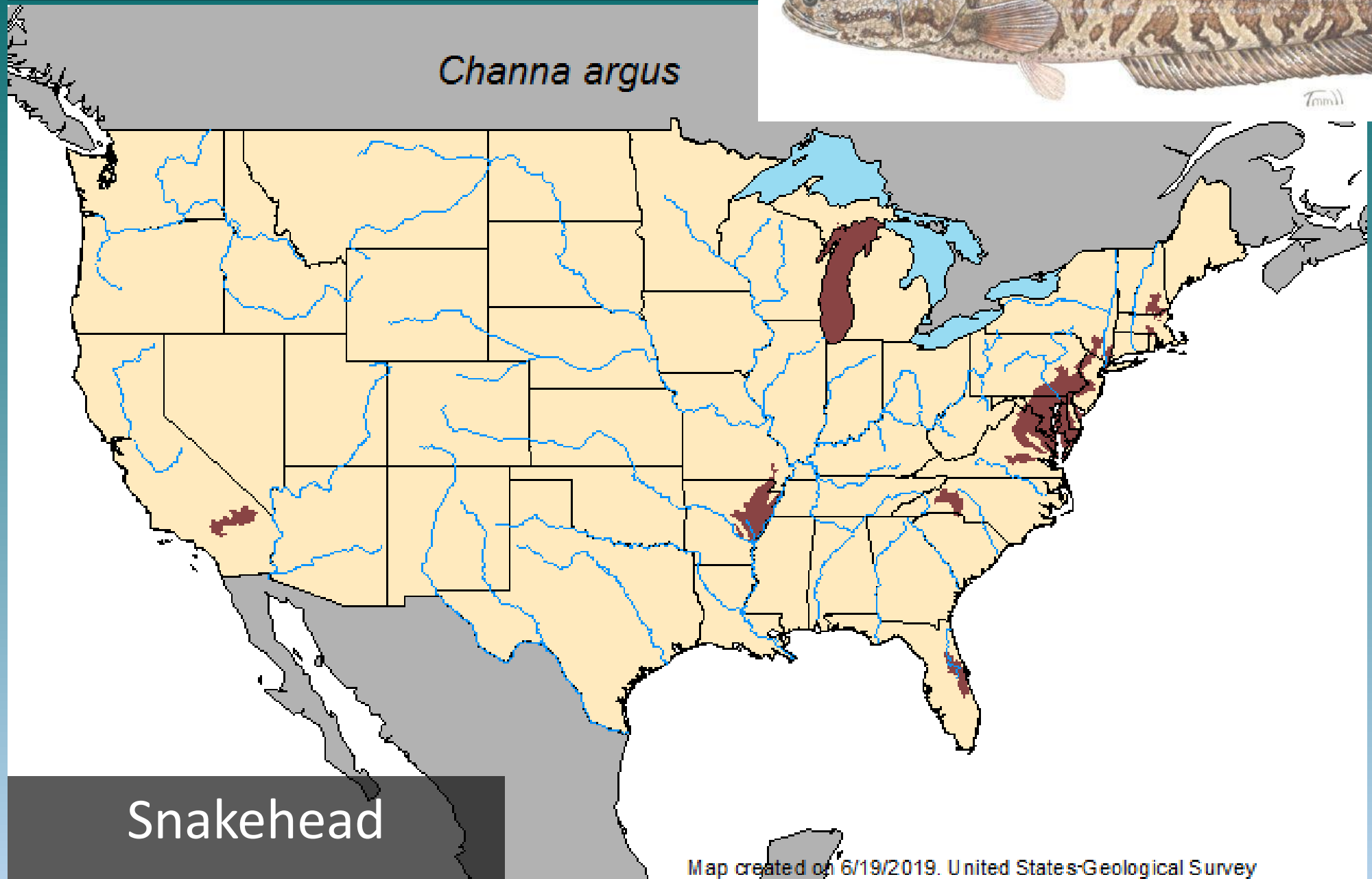


Quagga Mussel

These surveys showed a large shift in Dreissenid dominance from zebra mussels (84.3% of the dreissenid population) in 2009 to quagga mussels (88.5% of population) in 2015. **Of particular note, was the expansion of quagga mussels onto the mud/silt substrates of the profundal zone, previously not available to zebra mussels.**

Quantifying a shift in benthic dominance from zebra (Dreissena polymorpha) to quagga (Dreissena rostriformis bugensis) mussels in a large, inland lake. Journal of Great Lakes Research · January 2018

Other ANS of Concern



Snakehead

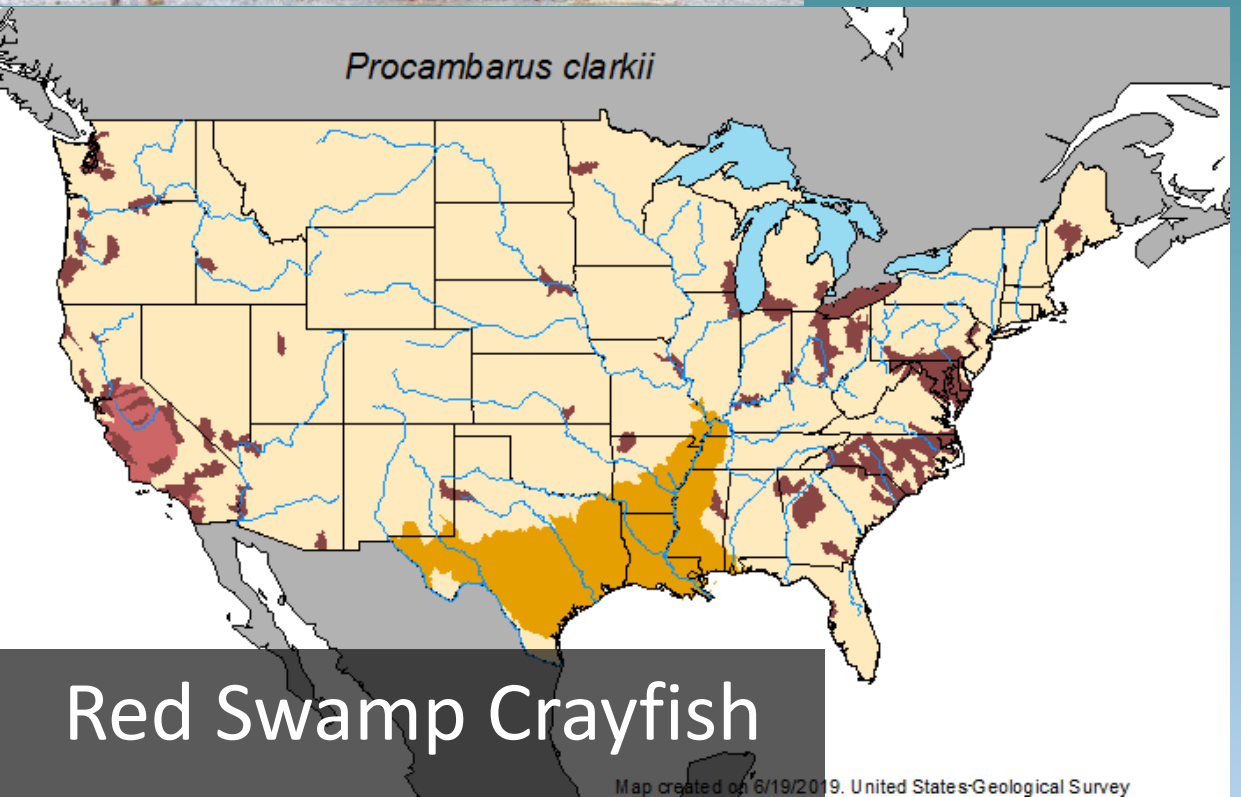
Other ANS of Concern

Mylopharyngodon piceus

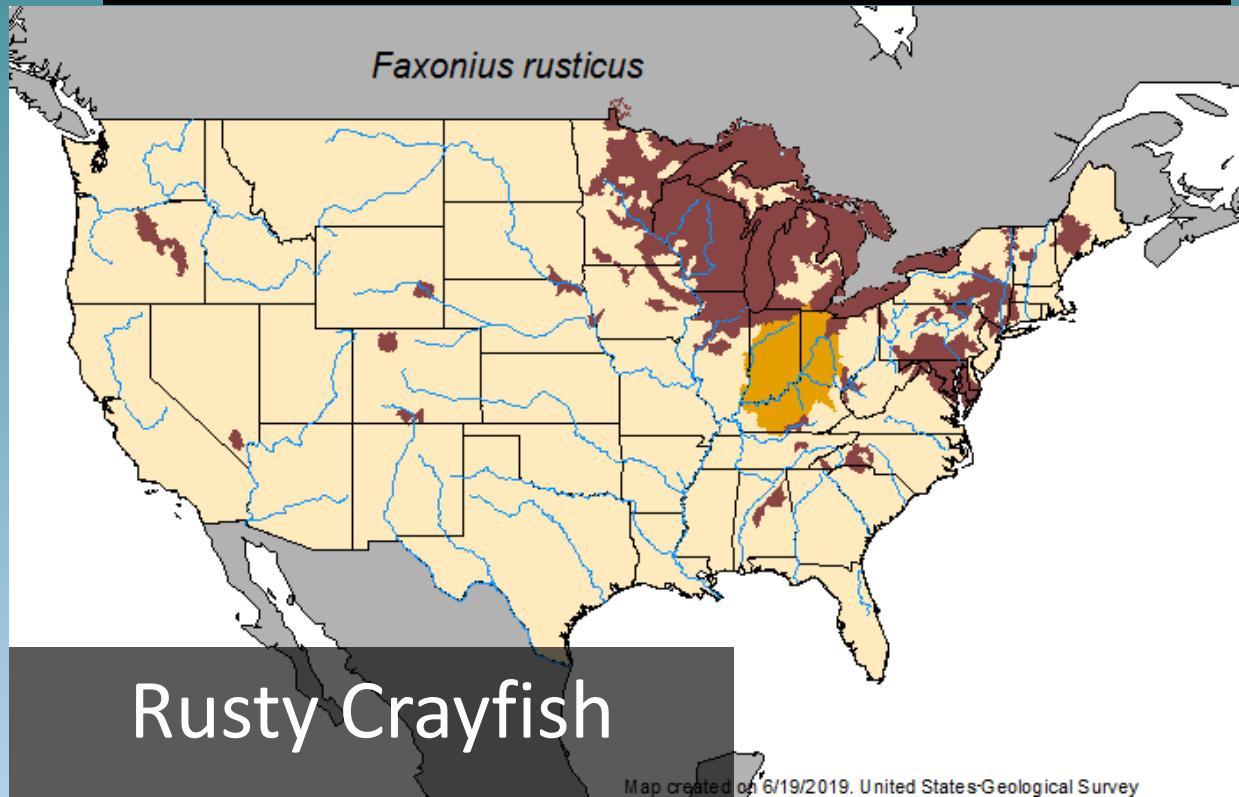
Map created on 6/19/2019. United States Geological Survey

Black Carp

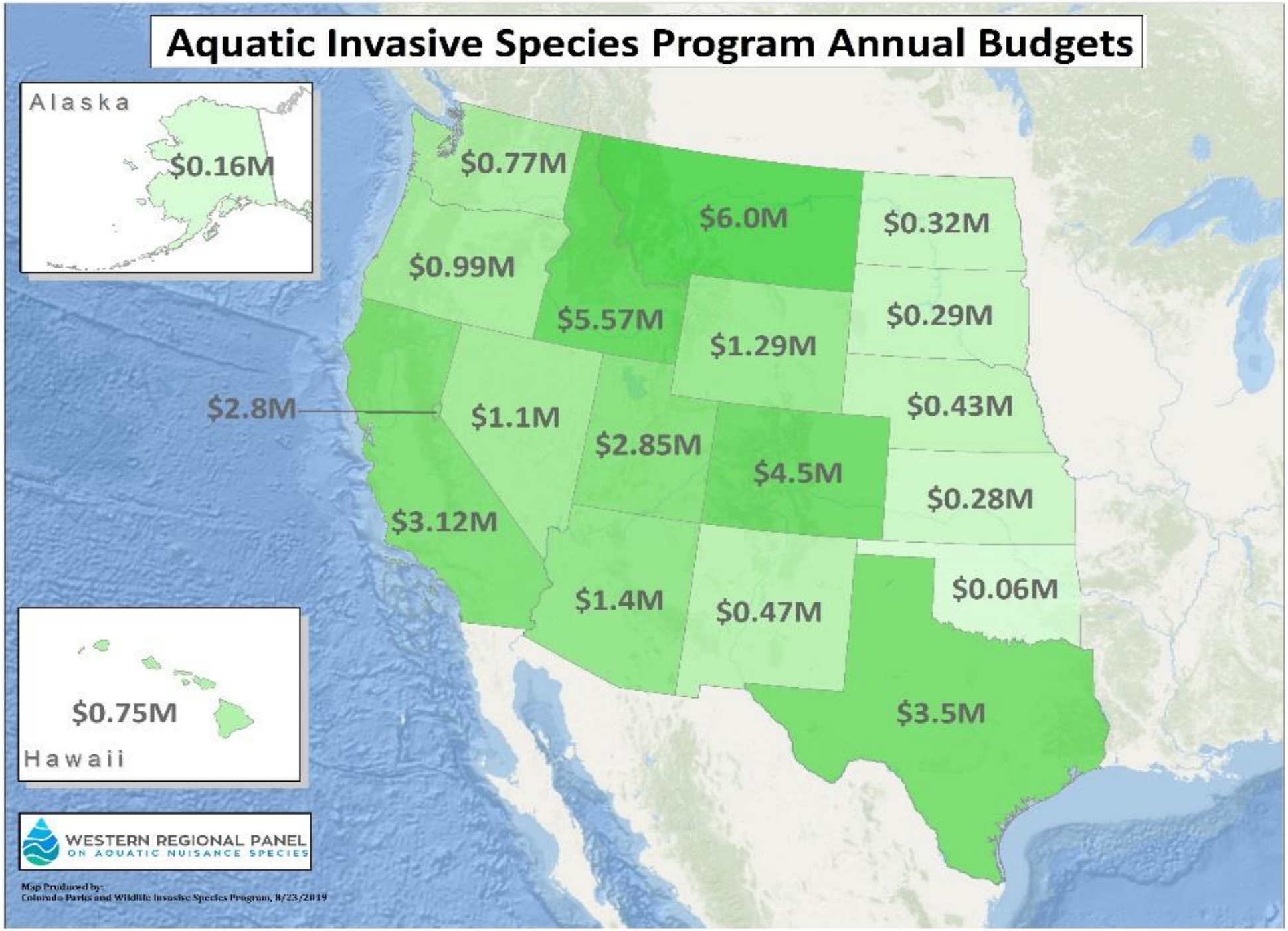
Other ANS of Concern



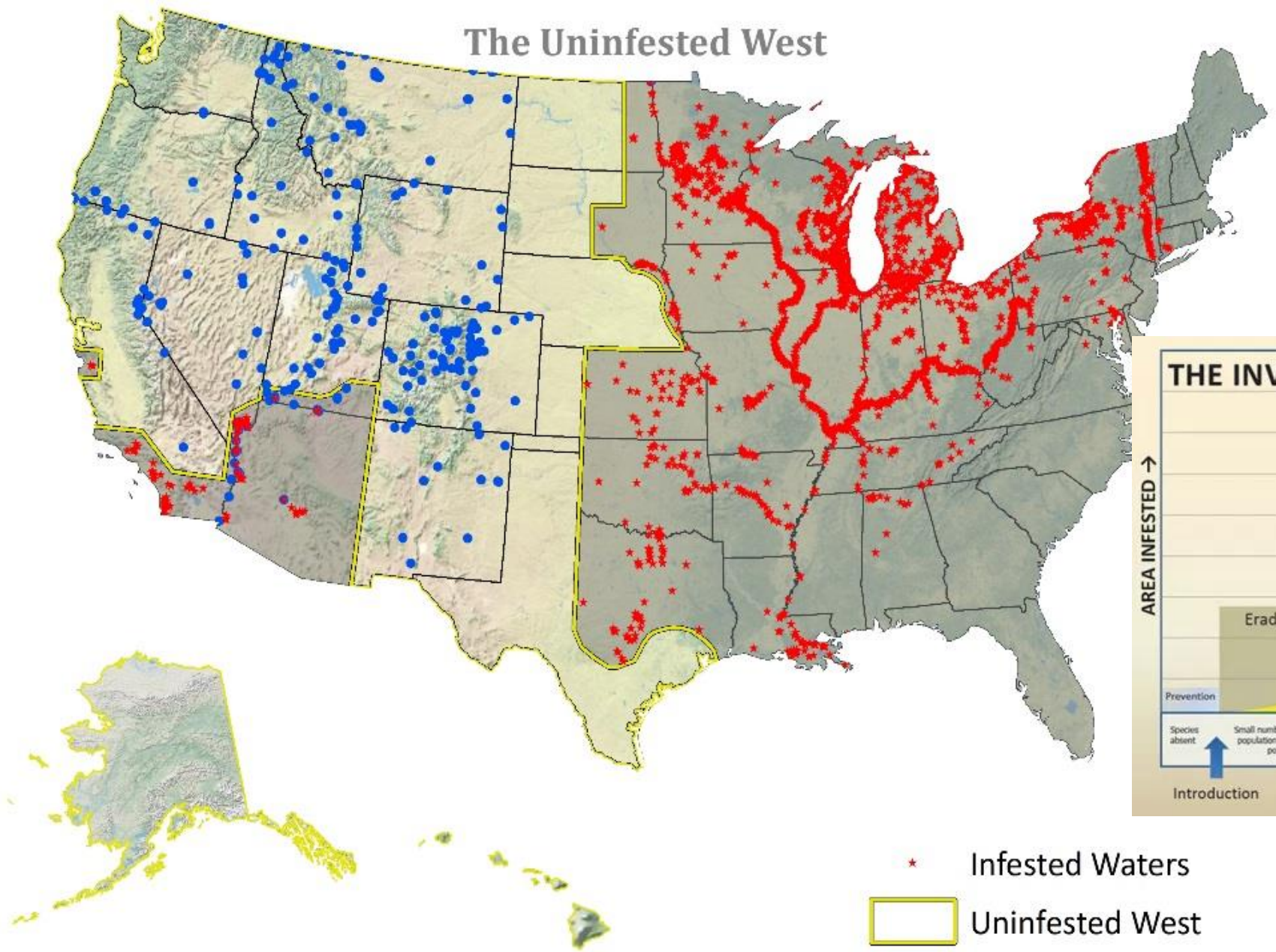
Red Swamp Crayfish

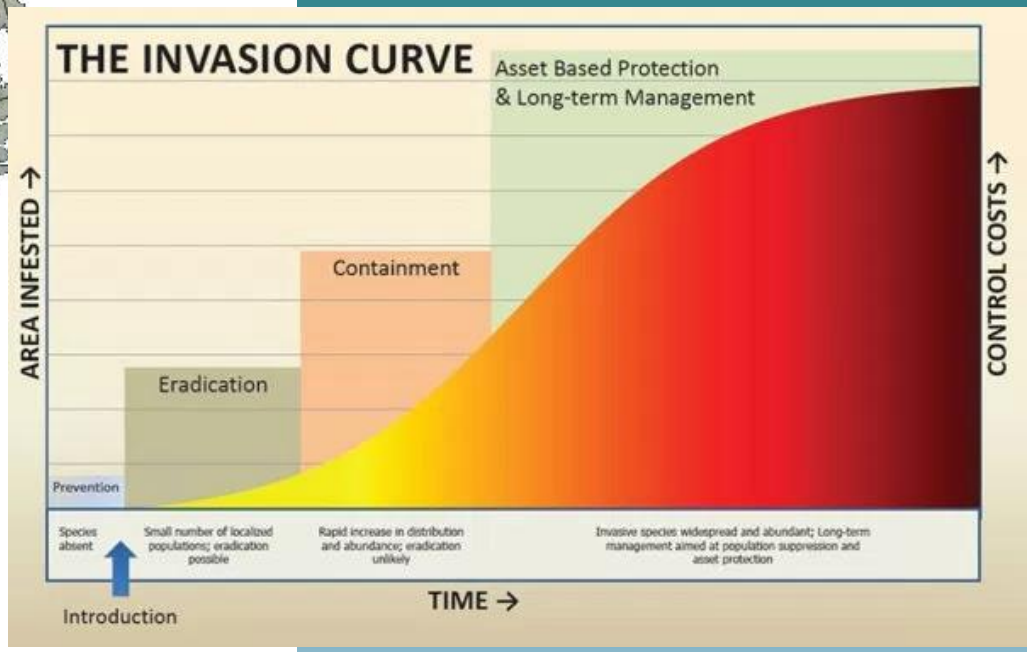


Rusty Crayfish


Aquatic Invasive Species Program Annual Budgets
Alaska
$0.16M
$0.77M
$6.0M
$0.32M
$0.99M
$5.57M
$1.29M
$0.29M
$2.8M
$1.1M
$2.85M
$4.5M
$0.43M
$0.28M
$3.12M
$1.4M
$0.47M
$0.06M
$3.5M
$0.75M
Hawaii
WESTERN REGIONAL PANEL
ON AQUATIC NUISANCE SPECIES
Map Produced by:
Colorado Parks and Wildlife Invasive Species Program, 8/23/2019

The Uninfested West





Infested Waters

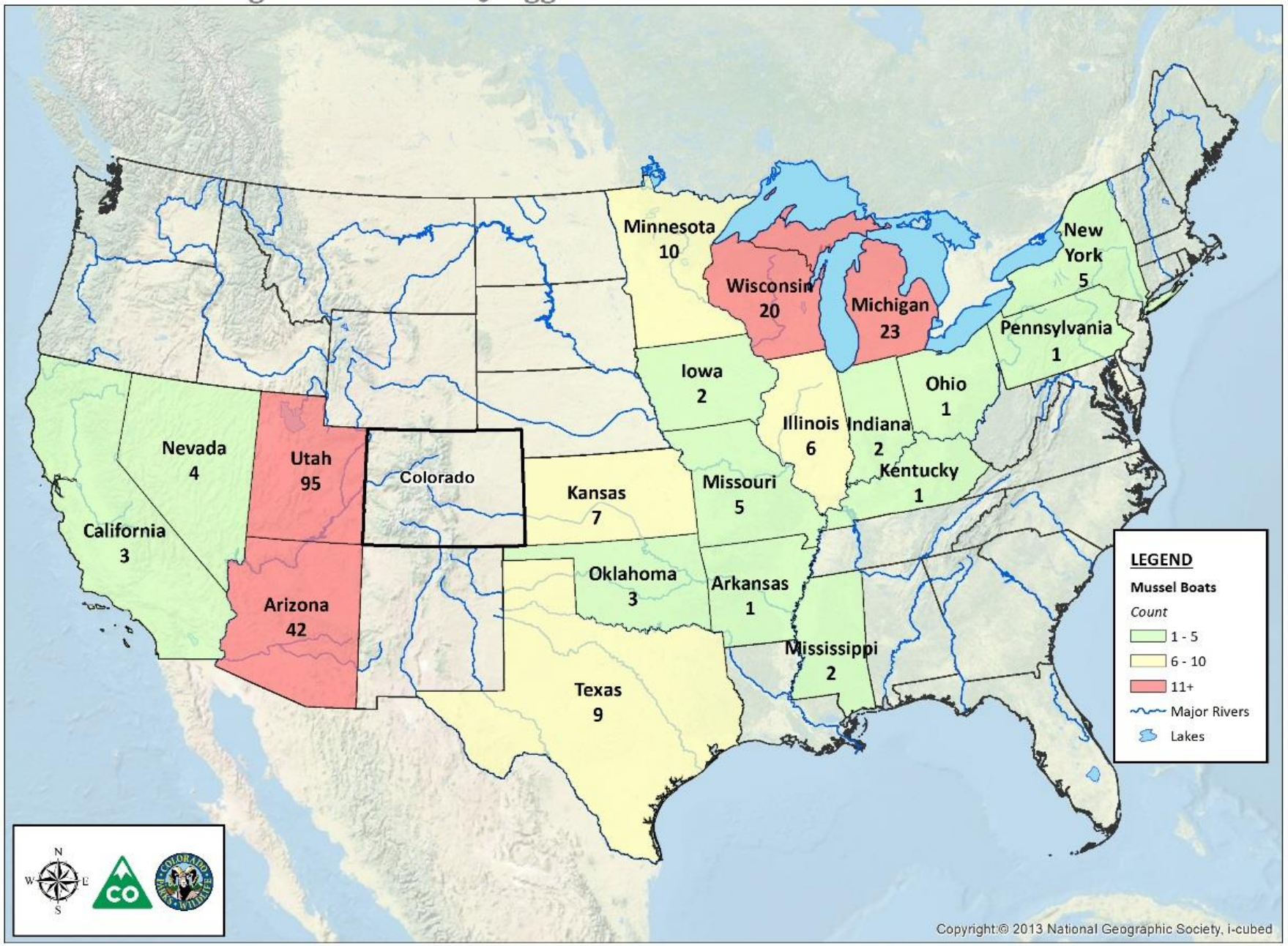
Uninfested West

Existing WID Stations

*NE, ND, SD only have roving patrols

Map Produced by:
Colorado Parks and Wildlife Invasive Species Program, 8/20/2019

Boat Origin for Zebra & Quagga Mussel Positive Interdictions in Colorado



Map Produced by: Colorado Parks and Wildlife Invasive Species Program, August 2019

0 100 200 300 400 Miles

Future ANS Funding Opportunities/Challenges

- WRDA – Water Resources Development Act
  - Watercraft Inspection funds for the Columbia, Upper Missouri, South Platte, Upper Colorado, and Arkansas River (new in 2020) basins
  - $15,000,000 expected for program
  - 50/50 match
- National Asian Carp Plan funding - 2020
  - $25 million ($14 million increase) for Asian Carp management efforts throughout MS River Basin
  - Kansas and Arkansas River basins added for 2020
  - 15/85 match
- RAWA – Recovering Americas Wildlife Act – 2021?
  - $1,300,000,000 (1.3 Billion) to states to manage for species of greatest conservation need
    - Kansas portion $21,000,000
  - 25/75 match
- Insufficient state funds to capitalize on available federal funds

Questions?

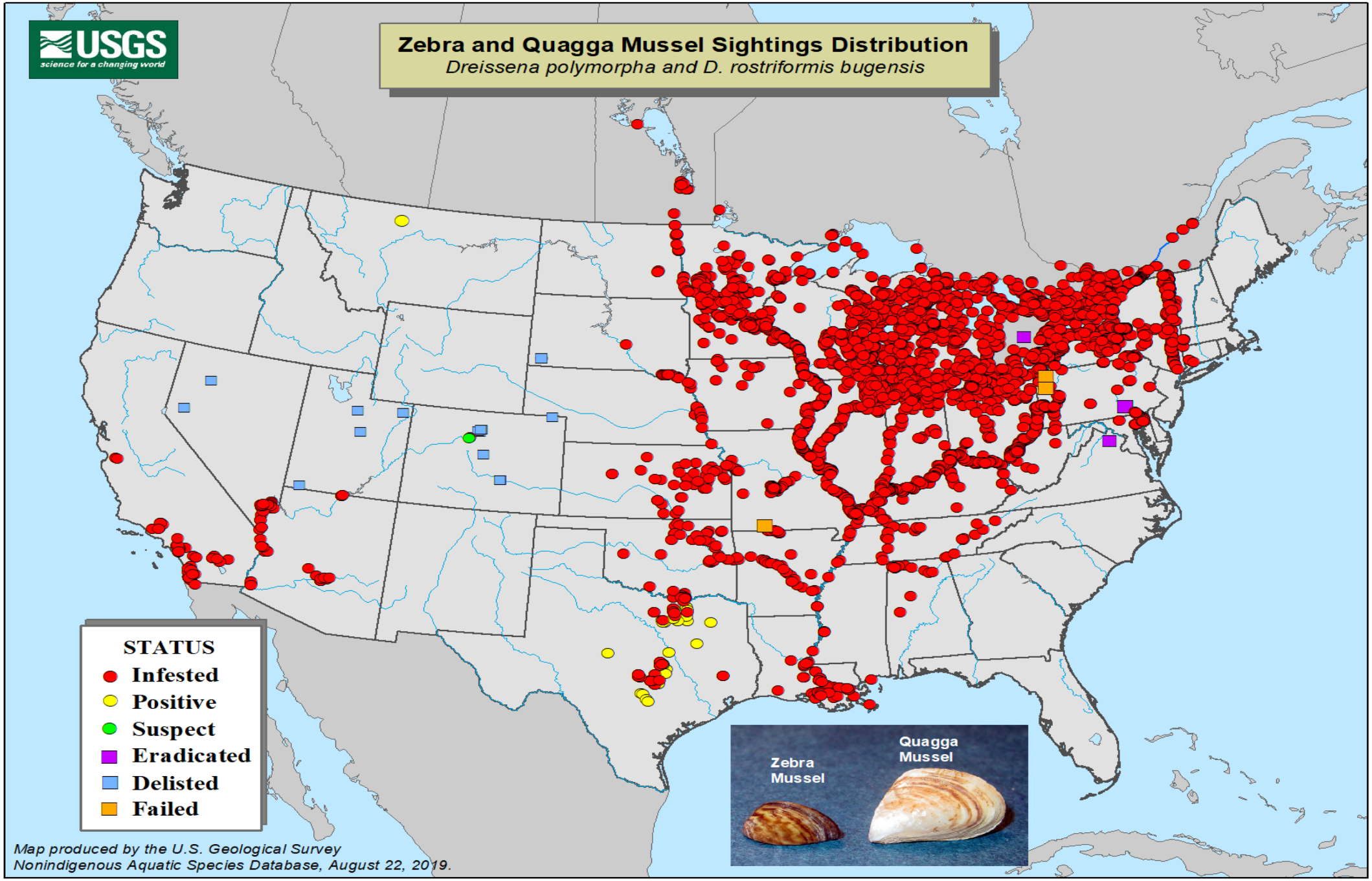
3 Simple Steps

CLEAN

DRAIN

DRY

Every lake, every time!


USGS
science for a changing world
Zebra and Quagga Mussel Sightings Distribution
Dreissena polymorpha and D. rostriformis bugensis
STATUS
Infested
Positive
Suspect
Eradicated
Delisted
Failed
Zebra Mussel
Quagga Mussel
Map produced by the U.S. Geological Survey
Nonindigenous Aquatic Species Database, August 22, 2019.