



Elizabeth Brown
Invasive Species Coordinator
Colorado Division of Wildlife

State ANS Program Overview

*Aspinall Operations Meeting
September 2, 2010*

The Mission of the Colorado ANS Program

To Prevent the Introduction of Zebra & Quagga Mussels, and Other ANS, by Containing Current Infestations and Stopping the Spread into New Waters



Colorado ANS History

2002: First aquatic weeds and mollusk surveys for ANS

2003: Zebra Mussels in KS

2004: Boulder Creek EWM found

2004: New Zealand Mudsnail found

2005: Unofficial State ANS Partnership Formed

– DOW, DPOR & USFWS

- Goal was to coordinate ANS activities and to rapidly respond to ANS infestations in Colorado.

- Collaboration: EDRR, Education, Monitoring, Sampling, Control, Mapping, Research, Angler Education Program

- Boater Surveys

– Sampling based on risk assessment: survey 160+ waters in CO for all ANS species of concern

2007: Colorado ANS Steering Committee Formed

2008: Zebra Mussels Found in Colorado



State ANS Act

- Passed in May 2008
- Formalized State ANS Program
- Illegal to possess, import, export, ship, transport, release, plant, place, or cause an ANS to be released.
- Authority to “Agents” & Qualified Peace Officers to inspect, decontaminate and quarantine watercraft for ANS.
- Creates in the State Treasury an ANS Fund in both the CDOW and State Parks.
 - FY08-09 – CDOW - \$3.9M
 - FY08-09 – Parks – \$3.2M
 - FY09-10 – CDOW – \$1.3M
 - FY09-10 – Parks – \$2.7M



State ANS Regulations



- Focused on species transported on boats
- Makes it illegal to possess, transport, import, export, ship, release, cause to be released, etc. any ANS on list
- Makes it illegal to transport plant material on watercraft or trailers (conveyances)
- Requires permits for sampling of or monitoring for listed ANS species from CDOW.
- Requires reporting of ANS to CDOW.
- Sets minimum standards for declaration of a water which is positive for an ANS.

Zebra & Quagga Mussel Management Plan

- Completed in 2008
- Implementation Began in March 2009
- Updated August 2009
- Partnership Effort!



State ZQM Management Plan Components

- Collaborative Process
- Sampling & Monitoring
- WID Containment & Prevention
- Legal Authority
- Fish Hatchery Program
- Technology
- Communication & Information
- Education & Outreach
- Research
- Volunteerism



STOP

Eurasian Watermilfoil 2 inch
New Zealand Mud Snail 6 mm
Zebra Mussel 1 inch

Stop the Invasion of Harmful Aquatic Plants & Animals

You can help protect our waters. Before entering and when leaving waterbodies, please:

- *Inspect boats, trailers, boots, gear and equipment.*
- *Remove all mud, plant, and animal material.*
- *Disinfect and dry all equipment for 5 days before entering a new waterbody.*

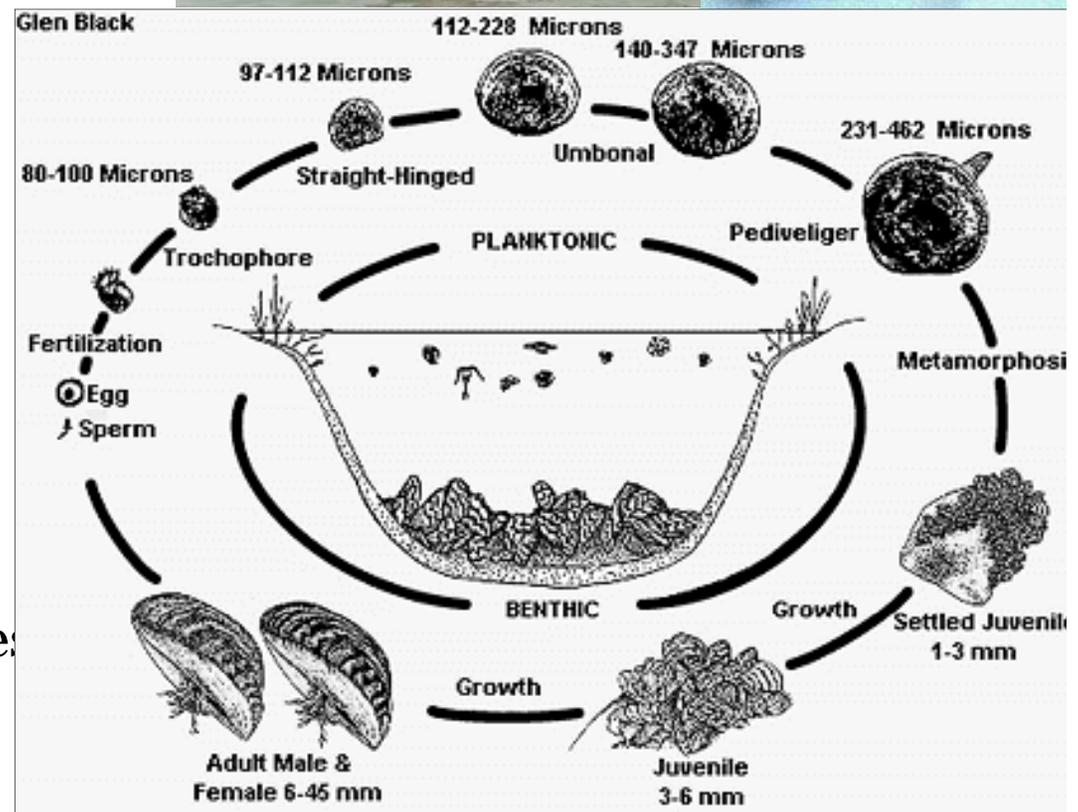


ANS Sampling and Monitoring

Early Detection Monitoring

- DOW Technicians
 - Plankton tows
 - Substrate checks
 - Shoreline surveys
 - Stream surveys
 - Hatcheries

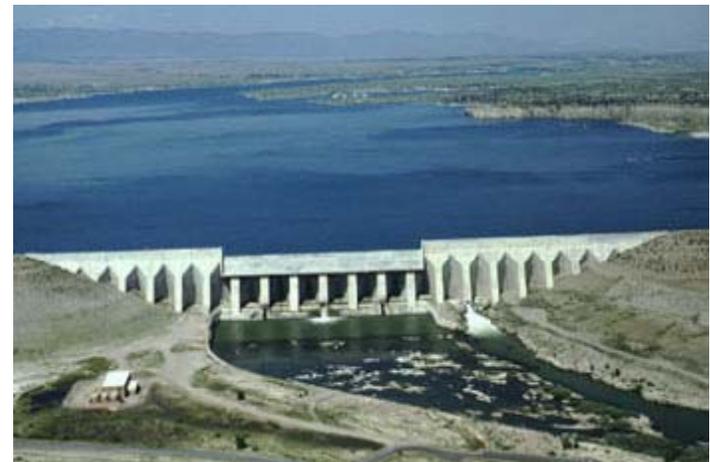
- Partners
 - Reclamation
 - National Park Service
 - U.S. Forest Service
 - Westminster
 - Colorado Springs Utilities
 - Denver Water



First Positive Results for ZQM in Colorado

Lake Pueblo

- Sample taken on November 24, 2007
- Positive PCR and Gene Sequencing Positive Results on January 18, 2008
- 1 veliger and 2 unidentifiable adults believed to be zebra mussels on substrate



2008 Positive Results for ZQM Veligers

- **Lake Granby – Quagga Mussels**

- Sample taken June 11, 2008
- Final DNA results July 10, 2008
- WID response August 15, 2008



- **September 26, 2008**

- Grand Lake - Zebra and Quagga Mussels
- Shadow Mountain - Quagga Mussels
- Willow Creek - Quagga Mussels
- Lake Pueblo - Zebra and Quagga Mussels

- **October 8, 2008**

- Tarryall Reservoir – quagga mussels
- Jumbo Reservoir – quagga mussels



2009 Positive Results for ZQM

Lake Pueblo

- Tested Positive for 3rd Year
- 5 total veligers detected
 - 1 veliger detected by DOW
 - 4 veligers detected by BOR



Grand County Waters: Grand Lake, Lake Granby, Shadow Mountain & Willow Creek

- No mussels detected in 2009

Tarryall and Jumbo State Wildlife Areas

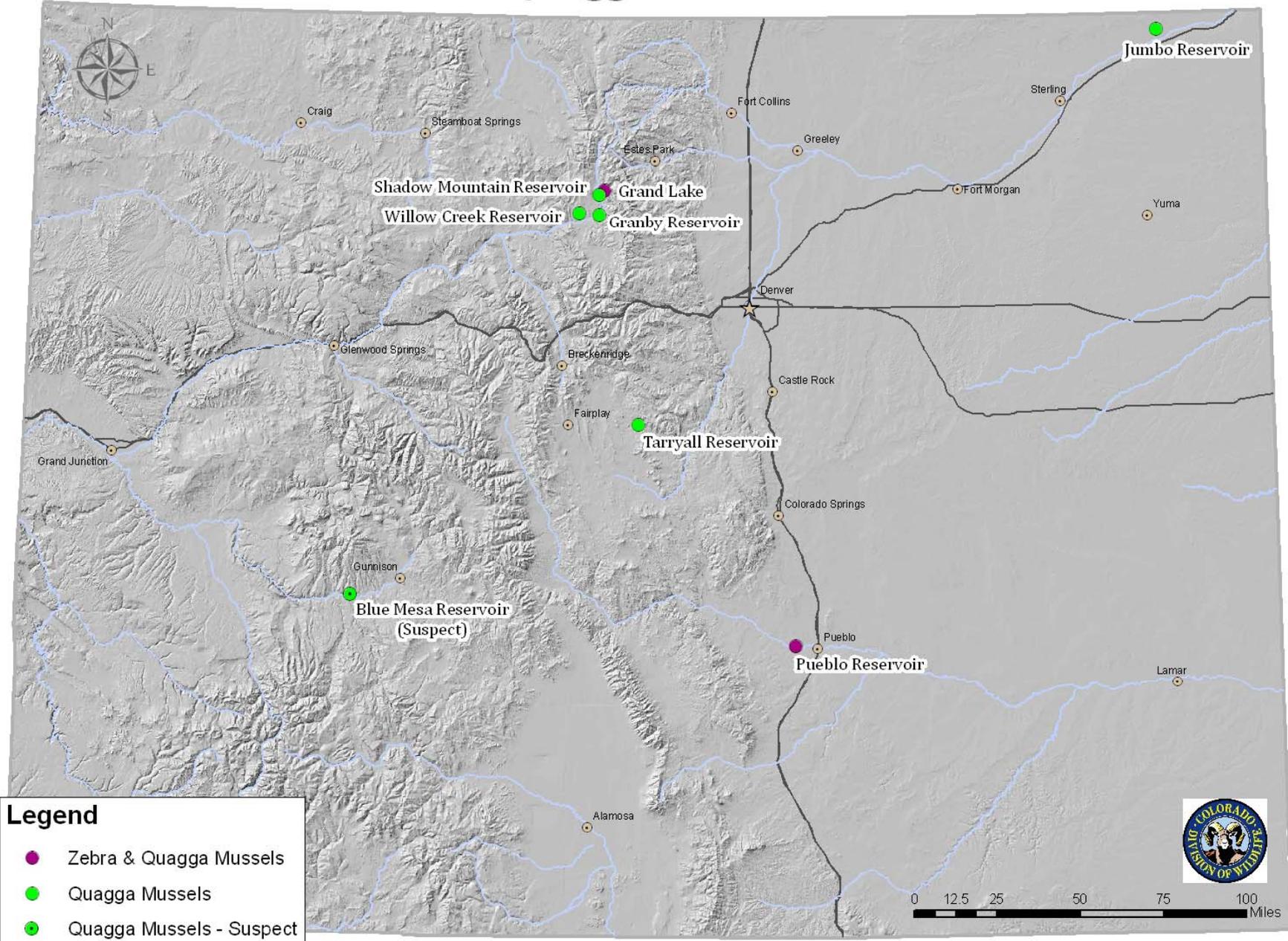
- No mussels detected in 2009

Blue Mesa (Suspect)

- No mussels detected in 2009



Zebra and Quagga Mussels in Colorado



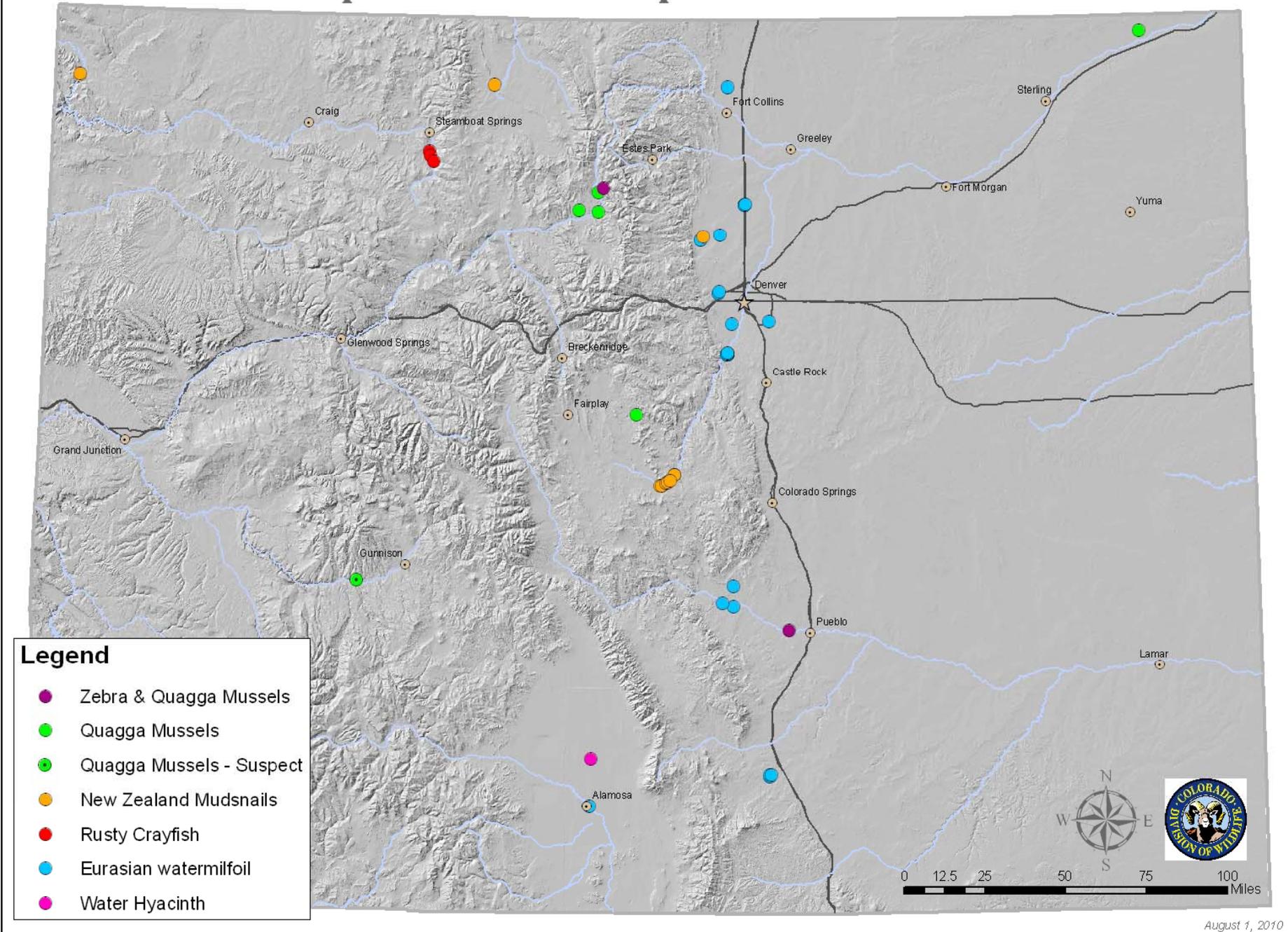
State ANS Regulations – Animal List

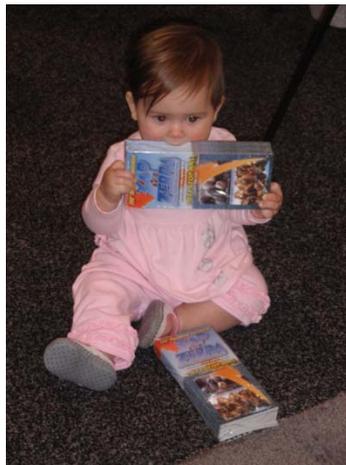
Common Name	Scientific Name
Crayfish, rusty	<i>Orconectes rusticus</i>
Mussel, quagga	<i>Dreissena rostriformis bugensis</i>
Mussel, zebra	<i>Dreissena polymorpha</i>
New Zealand mudsnail	<i>Potamopyrgus antipodarum</i>
Waterflea, spiny	<i>Daphnia lumholtzii</i>
Waterflea, fishhook	<i>Cercopagis pengoi</i>
Waterflea	<i>Bythotrephes cederstroemi</i>

State ANS Regulations – Plants List

Common Name	Scientific Name
African elodea	Lagarosiphon major
Brazilian elodea	Egeria densa
Eurasian watermilfoil*	Myriophyllum spicatum
Giant Salvinia*	Salvinia molesta
Hyacinth, water	Eichornia crassipes
Hydrilla*	Hydrilla verticillata
Parrotfeather	Myriophyllum aquaticum
Yellow floating heart	Nymphoides peltata

Aquatic Nuisance Species in Colorado





Education, Outreach, Information

Education & Outreach

- Watercraft Inspection and Decontamination
- Professional Education
 - ANS Workshop
 - Sampling & Monitoring Training School
 - Certification Program
 - Conferences / Meetings
- Public Meetings
- Expos/Tradeshows
- Face to Face Contacts
- Children's Education
- Print Materials
 - Billboard Campaign
 - Brochures, Handouts
 - Water Bill Flyers
 - Letter to Boaters
 - HOA Postcards
 - Signage
 - Magazine Articles
 - Newspaper Coverage
- Electronic Materials
 - TV/Radio Coverage
 - Website
 - Web casts
 - Email Lists



You can help protect our waters.
Before entering and when leaving waterbodies, please:

- **CLEAN** all mud, plant and animal material from boats, trailers, boots, gear and equipment.
- **DRAIN** all water from bilges, live wells and ballast tanks.
- **DRY** all equipment completely before entering a new body of water.



1-877-STOP-ANS



**STOP AQUATIC
HITCHHIKERS!**
Prevent the transport of nuisance species.
Clean all recreational equipment.
www.PreventHitchhikers.com

For more information, please contact the Colorado Division of Wildlife (303) 297-1192



Mandatory Boat Inspection Checkpoint

Remember to:

CLEAN • DRAIN • DRY



100th Meridian Initiative

ZAP THE ZEBRA

www.100thMeridian.org

Please report any sightings by calling our National Hotline:
1-877-STOP-ANS
1-877-786-7267

Quagga Mussels



Zebra Mussels



ALERT!

Stop the spread of
ZEBRA MUSSELS
CLEAN • DRAIN • DRY

Stopping their spread is critical.

- These invaders **reproduce quickly** and once established, they cannot be eliminated.
- They can attach to the hull, engines and steering components of boats and can **damage boat motors** by clogging cooling intakes.
- Their spread can cause **millions of dollars** in economic, environmental and ecological damage.
- **Adult mussels attach to boat hulls and motors.** They can spread to other waters by boats.
- Larvae can be **transported in bilge or ballast water.**



For additional information please contact:



Colorado State Parks

303-866-3437



303-297-1192

National Invasive Species Hotline

1-877-786-7267

CLEAN • DRAIN • DRY

ALERT!

Stop the spread of
ZEBRA MUSSELS
CLEAN • DRAIN • DRY

Before moving your boat to another body of water:

CLEAN → Remove all plants, animals, mud, and thoroughly wash everything coming into contact with the water.

DRAIN → Drain all water before leaving the area, including wells, bilge, ballast, and any other areas of your boat holding water.

DRY → Allow everything to completely dry before launching into another body of water.

BAIT → Dispose of unused live bait in the trash.

PWC → **(PERSONAL WATERCRAFT)**

- Do not run through aquatic plants.
- When loading, push or winch the PWC onto the trailer without running the engine.
- After loading, run the motor for 5–10 seconds to blow out excess water and contaminants.
- **Clean, drain, dry.**

REPORT ANY SIGHTINGS OF ZEBRA MUSSELS!
1-877-STOP-ANS (1-877-786-7267)

Before Leaving & Before Launching...
Inspect Everything!



In Colorado, it is unlawful to possess, import, export, ship or transport zebra mussels or other aquatic nuisance species.

Colorado

the Watershed Defenders

In Don't Move a Mussel



We're Flo and Jo, clean water ambassadors, and we're here to tell you about things that are changing in our watershed...it seems that a hostile presence is making itself known and its impact on the watershed could be catastrophic.

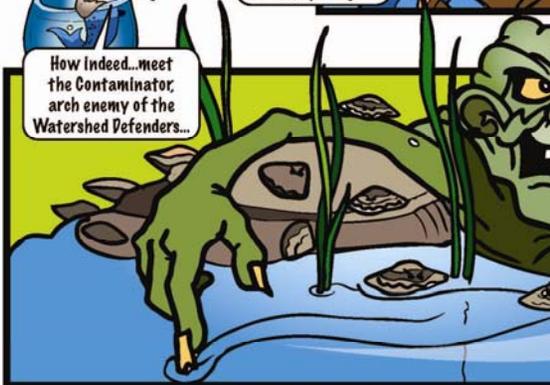
Meanwhile, at another location in the watershed, our hero W.D., makes a few more unnerving discoveries...

The water has a foul odor and is abnormally clear.

I can see to the bottom of this pool, but I don't see any signs of life except for these zebra-striped mussels...

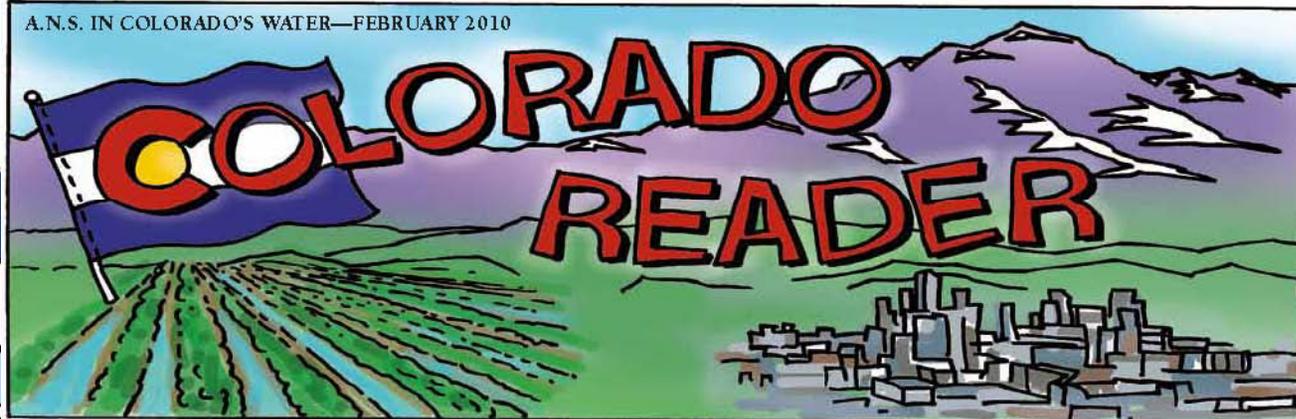
...I wonder if Kylie's found anything?

How indeed...meet the Contaminator, arch enemy of the Watershed Defenders...



What dastardly deed does the Co

A.N.S. IN COLORADO'S WATER—FEBRUARY 2010



AG IN THE CLASSROOM—HELPING THE NEXT GENERATION UNDERSTAND THEIR CONNECTION TO AGRICULTURE

Dad: Do remember this lake?

Chris: Yes. I caught my first fish there. We camped nearby and there were lots of birds. I thought I saw a bat. We fished from the rocks. The next day we went boating.

Dad: What do you remember about the rocks?

Chris: It was part of the dam. You said the water was deep next to the rocks, and that the water was stored in the reservoir so farmers and people in cities would have water when they needed it.

Dad: Do remember anything else about your time there?

Chris: We went to a wildlife class at the campground. They told us about the different birds and other animals that lived near the lake. We looked at some birds through binoculars and saw tracks in the dirt from deer and raccoons.

Dad: Who takes care of the lake?

Chris: There were rangers and volunteers to help, but they said all of us needed to help by not littering or polluting.

Dad: What would you think if people didn't take care of this lake?

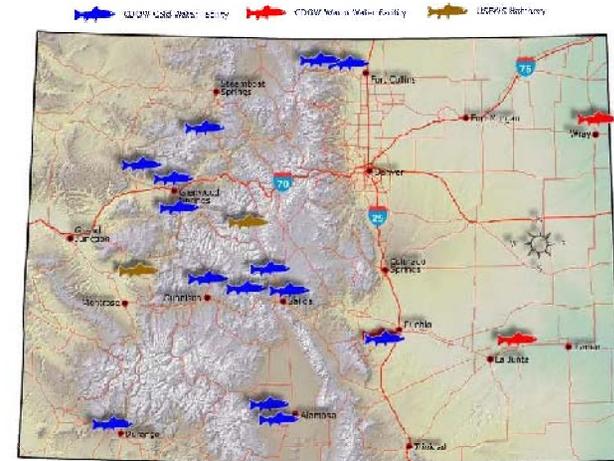
Chris: I'd be sad. That's the best place to visit...



Don't Move a Mussel!
See inside!

State Fish Hatchery Program

- Proactive methods
 - *Annual Fish Health Inspections*
 - *Hazard Analysis and Critical Control Point Planning*
 - *Trainings & Workshops*
- Pueblo State Fish Hatchery
 - The hatchery is regularly monitored and tested according to state protocols.
 - To date, no mussels have been identified, but disinfection protocols are still being implemented.
- Preventative Measures: Wild Spawn, Fish/Egg Transfer



CDOW Aquatic Biologists

- **HAACP for biologist field operations**
 - Every boat must be fully decontaminated in between each use
 - All Biologists now have access to a decontamination unit
- **All field equipment must be decontaminated in between each use by an approved method**
- **Aquatic biologists are certified Inspection and Decontamination Authorized Agents**



CDOW ANS Research Projects

- Boat Decontamination focused on interior compartments that hold water (bilge, ballast, etc.) at CSU
- Fish Hatchery Program protocols for disinfection for wild spawn, fish stocking and egg transfer at CSU
- Modeling based on recreational vector utilizing 2006-2008 boater surveys and downstream movement vector – 2 studies at OSU & UCD
- Downstream Veliger Movement – Completed by Denver Water in October 2009





ANS Watercraft Inspection & Decontamination

Mandatory Inspection Program

Resident Boaters

You must pass a state-certified boat inspection if:

- **You have traveled outside of the state to boat.**
- **If you have launched on any of the Colorado lakes or reservoirs where mussels have been detected.** You must submit to an inspection for aquatic nuisance species **prior to leaving the body of water.**
- **You enter a reservoir where inspections are required.** Boaters should expect to be inspected at any lake or reservoir in the state.

Out-of-State Boaters

You must pass a state-certified boat inspection if:

- **You plan on launching in any Colorado lake, reservoir or waterway.**

Site Specific ZQM Management Plans

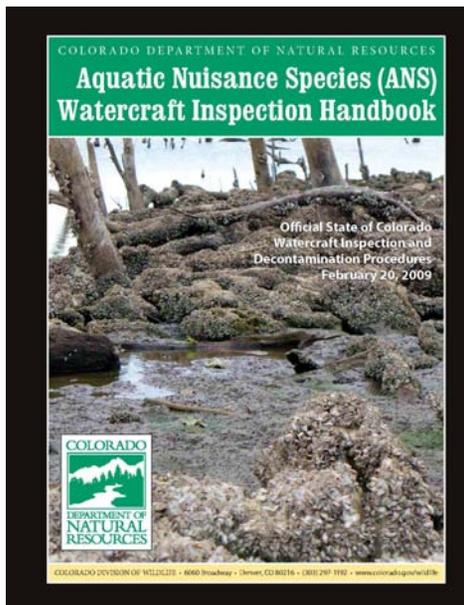
- Bring all partners together for Implementation of State ZQM Plan on a site by site basis
 - Owner
 - Facilities
 - Recreation Managers
 - Watercraft Inspections
 - Water Providers
 - Distribution Systems
 - Local Government
 - Outreach, Enforcement
 - Marinas & Concessioners
 - Watercraft Inspections
 - Power Industry
 - Facilities
 - Etc.



GOAL = every one pitch in a little to do a big job!

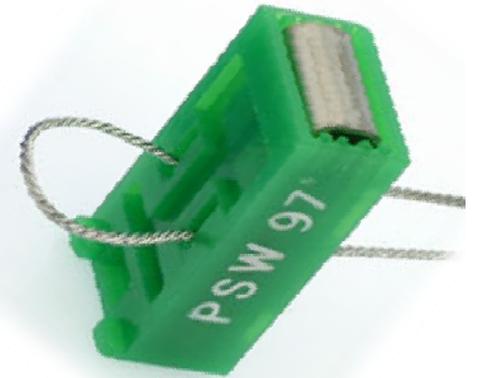
Inspector Training & Certification

- 2009 ANS Handbook is Training Manual
- 2010 Supplemental Training Publication
 - Updated Forms
 - New Containment Protocol for Positive Waters
 - Consolidated Support Documentation



Green Wire Seal System

- A single seal system – GREEN
 - Location & Unique Serial Number
- Locks the boat to the trailer so you know it hasn't launched since last inspection
- Documents procedures or inspections passed
- Only communication across jurisdictional stations
- Enables off-water WIDS at offices and dealers for convenience



BENEFIT: Speeds up inspection for boater at the ramp

BENEFIT: Provides documentation of watercraft history

PROBLEM: Takes additional time to do thorough exit inspection

PROBLEM: Acceptance of seals is based on trust across agencies and private industry.

Inspector Training & Certification

- **2009** – CDOW & State Parks conducted 58 trainings between March and November. Certified 736 individuals.
- **2010** – CDOW conducted 38 trainings between March and July. Certified 198 new inspectors. Recertified 156 returning inspectors. Total of 354 certified by CDOW in 2010.



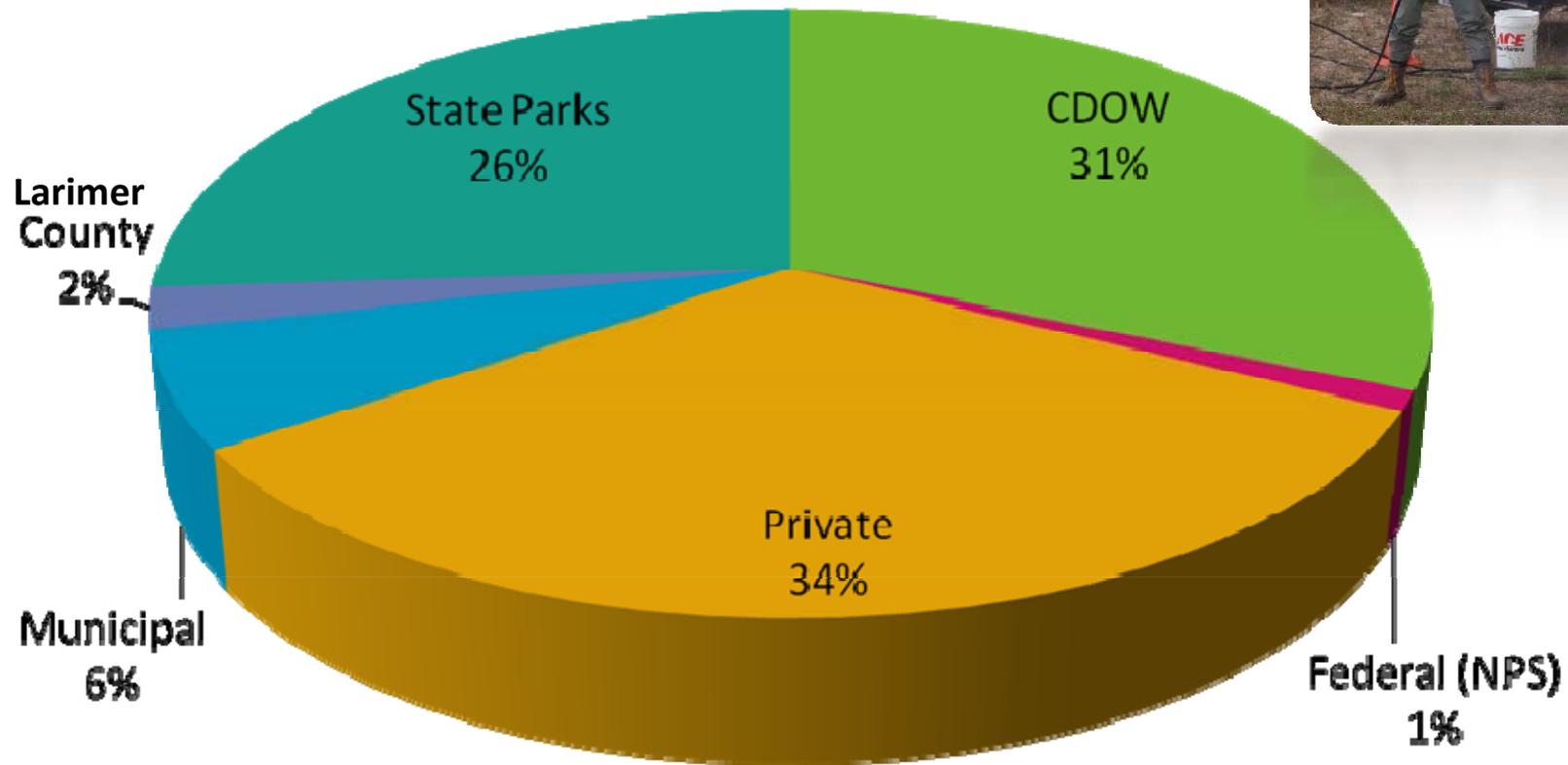
2009 Inspection Station Summary

- CDOW operated 17 Stations, including 5 positive waters
- CDOW funded 2 Larimer County Stations
- CDOW partnered with NPS at Blue Mesa
- CDOW co-funded 2 sites operated by private industry
- CDOW supported 62 sites operated by other agencies or private industry
 - 30 private industry
 - 13 private marinas
 - 10 municipal
 - 6 private clubs
 - 3 private lakes
- CDOW operated 7 roving patrols, that visited **90** waters.
- 28 sites were operated by State Parks.

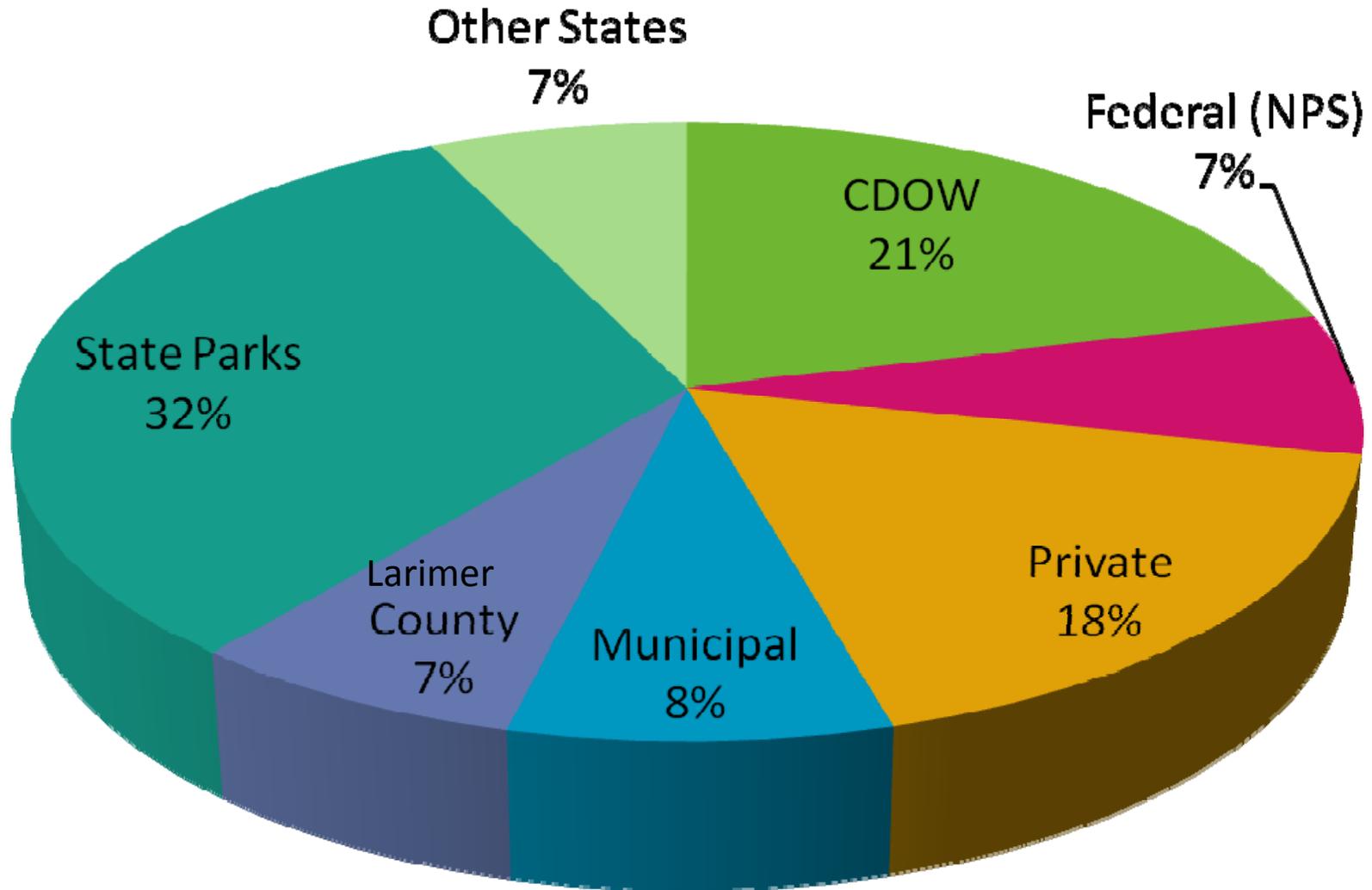


Total of 112 permanent and 90 temp stations = 202

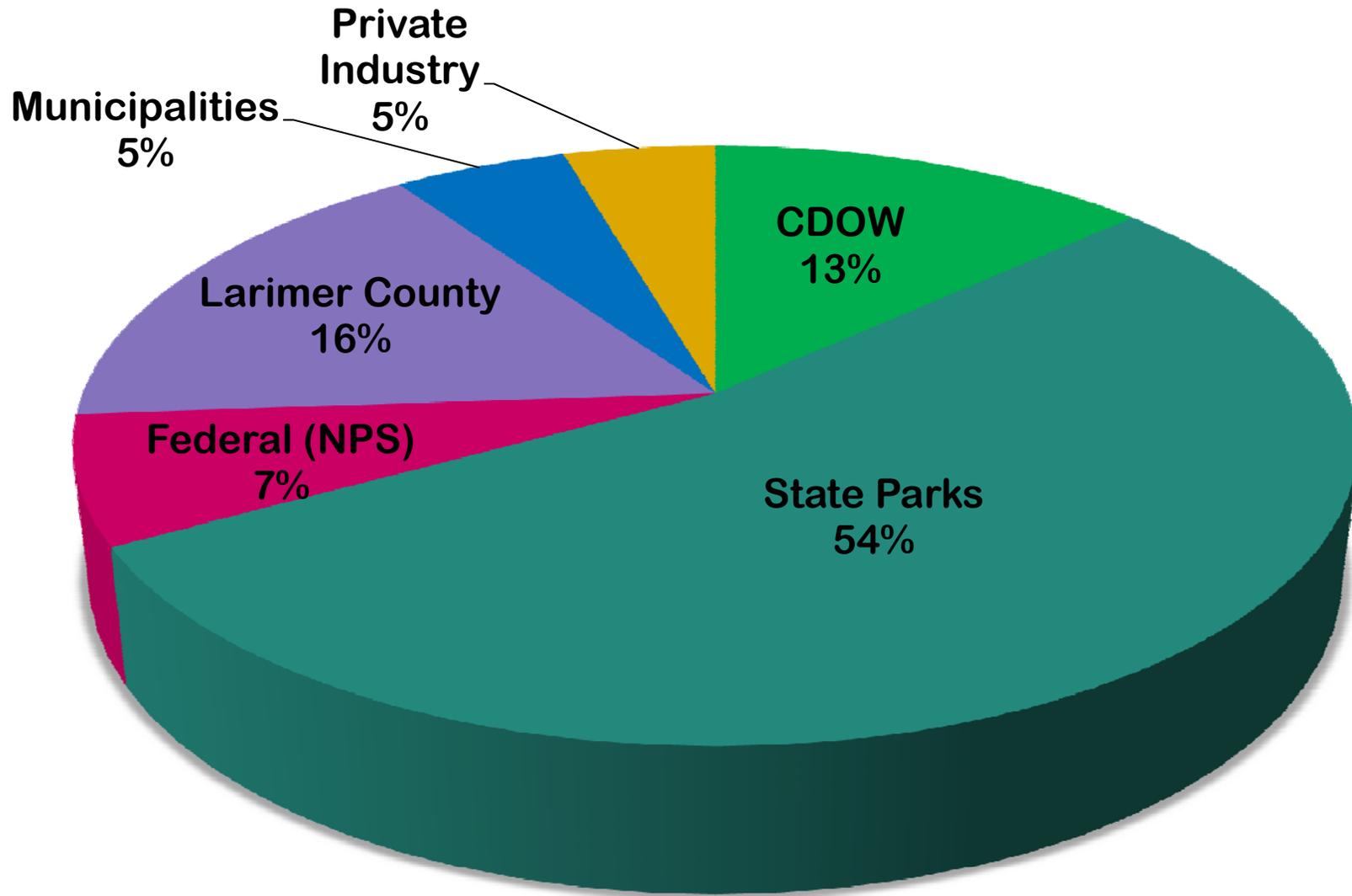
% of Stations Operated by Managing Entity



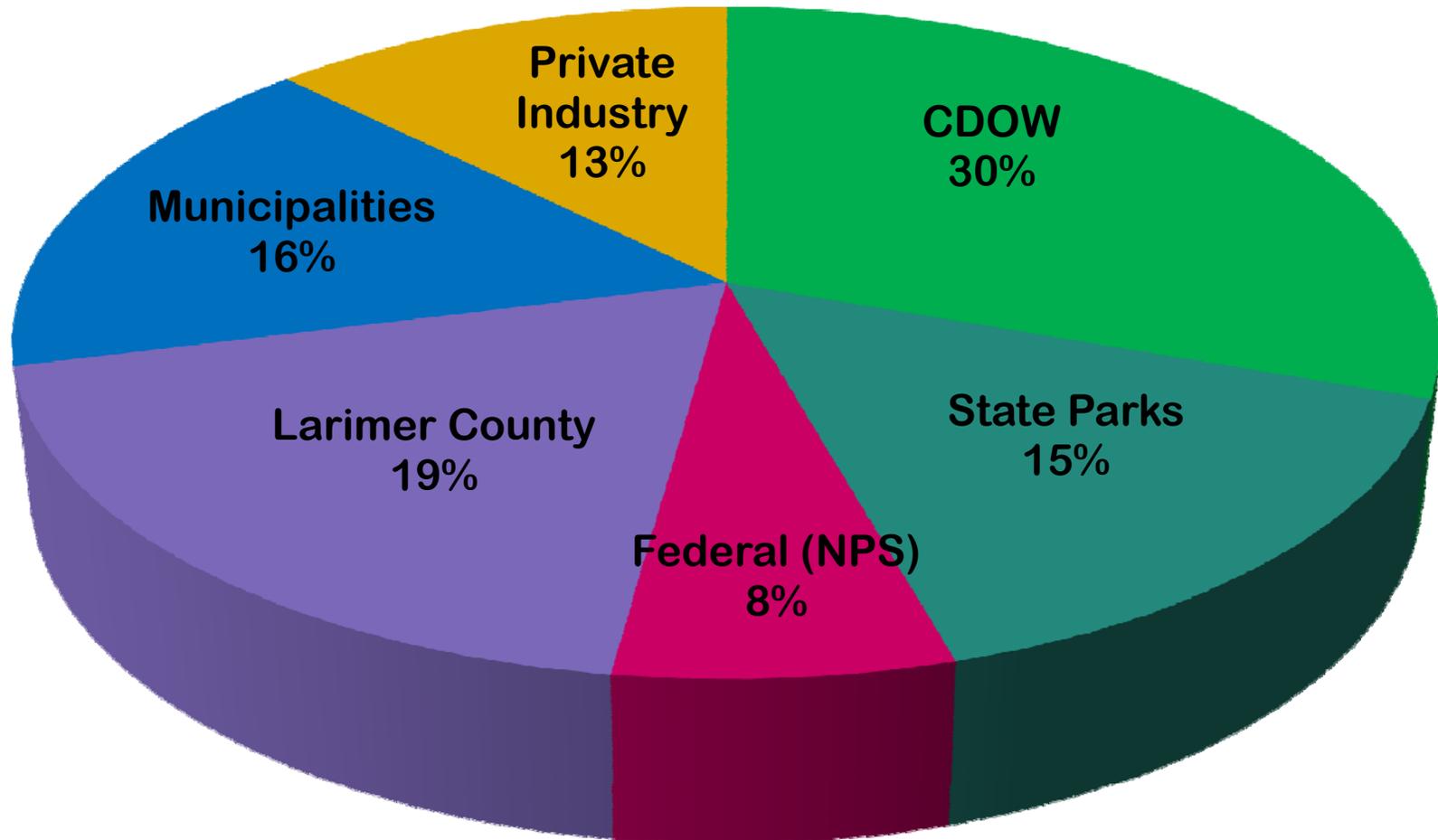
% of Certified Inspectors and Decontaminators Employed by Each Managing Agency



% of Inspections Performed by Managing Entity



% of Decontaminations Performed by Managing Entity



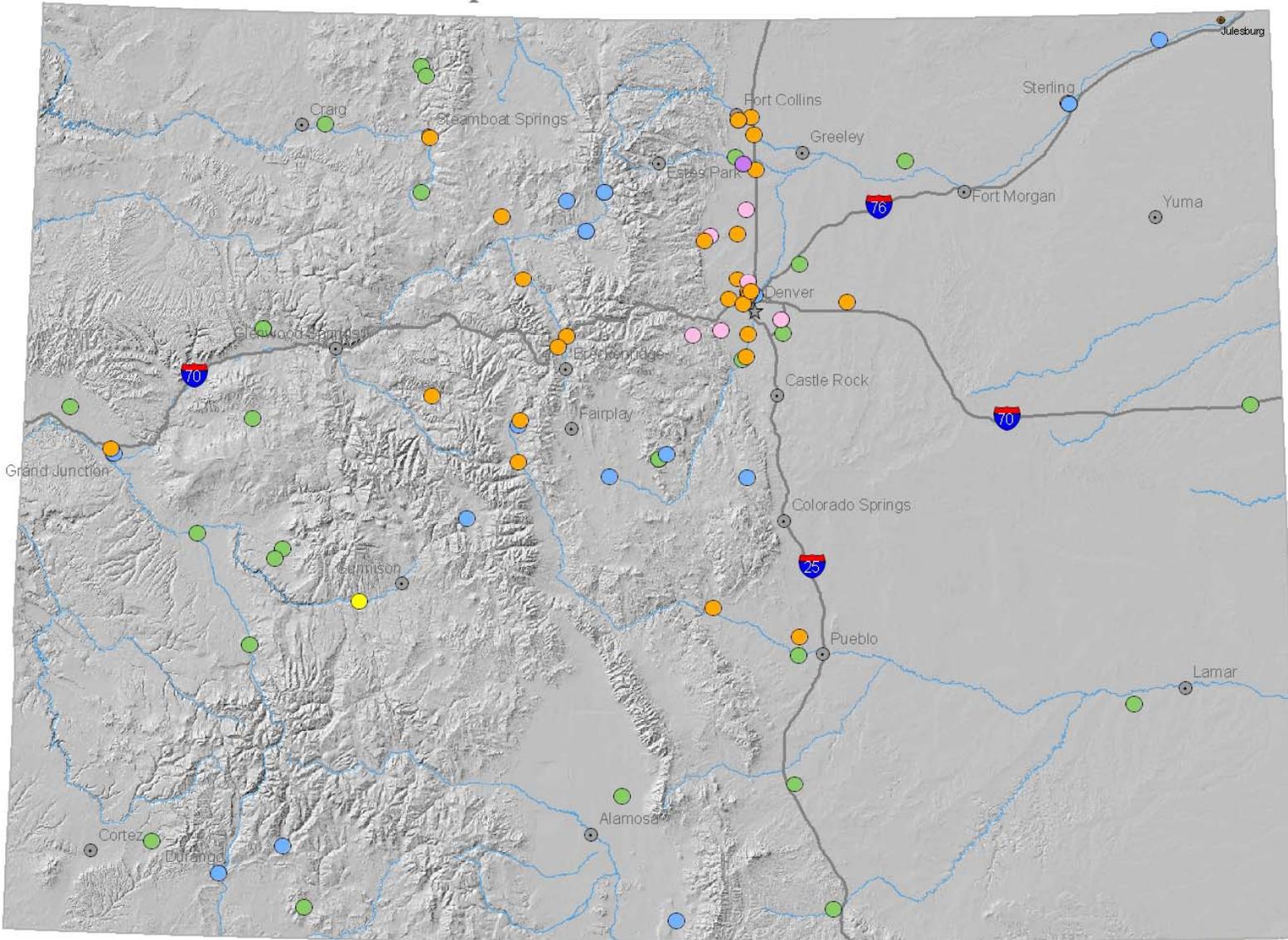
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- CDOW supported 58 sites operated by other agencies or private industry
 - 25 private industry
 - 13 private marinas
 - 11 municipal
 - 6 private clubs
 - 3 private lakes
- CDOW operated 1 statewide support team.
- 28 sites were operated by State Parks.



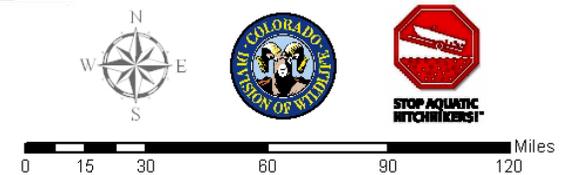
Total of 112 permanent inspection stations statewide

2010 Public Watercraft Inspection & Decontamination Stations in Colorado



Inspection Station Legend:

- | | | |
|---|--|-------------------|
| ● State - CO Division of Wildlife | ● County | ★ Denver |
| ● State - CO State Parks | ● Municipality | ● Regional Cities |
| ● Federal | ● Private | |



Interdiction of Mussel Boats

- In 2009 there were 19 boats with zebra or quagga mussels interdicted and decontaminated prior to entering Colorado's waters at inspection stations statewide.
 - Vessels were coming from AZ, IL, LA, MN, NY & OH.
 - Majority were from Arizona (Lake Pleasant or Havasu), Great Lakes and Mississippi River
- In 2010, there have been 14 boats with zebra or quagga mussels interdicted and decontaminated prior to entering our waters to date. One was here at Shadow Mountain Reservoir!
 - Similarly, infested vessels are coming from Arizona (Lake Pleasant) and the Great Lakes.



Quality Assurance & Field Support

- Quality Assurance of Authorized Locations and Call Centers for Watercraft Inspection and Decontamination
- Field Support for Authorized Locations
- On the Job Training for Certified Inspectors and Decontaminators
- Watercraft Inspection and Decontamination Certification Training
- Decontamination Equipment Prep, Support and Maintenance
- Drafting of Watercraft Inspection and Decontamination Protocols



State ANS Program Support Services

- **Site-Specific Planning**
- **Sampling/Monitoring**
- **ANS Identification**
- **Watercraft Inspection & Decontamination**
- **Training/Certification**
- **Educational Materials**
- **Workshops and Conferences**
- **Law Enforcement Support**
- **Motorboat Colorado Grant**



El Dorado, KS, Zebra Mussels 2003



El Dorado, KS, Zebra Mussels 2006



El Dorado, KS, Zebra Mussels 2006





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