

Official State Watercraft Inspection and Decontamination (WID) Protocols and Procedures



Certification WID Training Curriculum for Stage I and Stage II Authorized Agents

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2024





**Colorado Parks and Wildlife
Invasive Species Program
Aquatic Nuisance Species (ANS)**

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Agenda



State of Colorado—Parks and Wildlife

Watercraft Inspection and Decontamination Certification Training Agenda—Day 1 of 2

8:30–9:00 am	Students Join Class
9:00–9:30 am	Welcome and Introductions
9:30–10:00 am	Introduction: State ANS Program Overview
10:00–10:30 am	Zebra and Quagga Mussel Biology
10:30–10:45 am	BREAK
10:45–11:15 am	Other ANS Biology
11:15 am–12:30 pm	Watercraft 101
12:30–1:30 pm	LUNCH BREAK (on your own)
1:30–5:00 pm	New Inspectors STRONGLY RECOMMENDED to shadow



State of Colorado—Parks and Wildlife

Watercraft Inspection and Decontamination Certification Training Agenda—Day 2 of 2

8:30–8:45 am	Students Join Class
8:45–9:00 am	Review Day 1 Material
9:00–9:30 am	Introduction to Inspection
9:30–10:00 am	WID Mobile
10:00–10:30 am	Inspection Protocol
10:30–10:45 am	BREAK
10:45–11:45 am	Decontamination Overview
11:45 am–12:00 pm	Review
12:00–12:30 pm	EXAM
12:30–1:30 pm	LUNCH BREAK (on your own)
1:30–5:00 pm	Hands-on Training with Site Supervisors

Outdoor Demonstration—Entrance Inspection

What Did You Observe?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____



Chapter 1 Introduction and State ANS Program Information



Chapter 1: Introduction and State ANS Program Information

What are Aquatic Nuisance Species (ANS) or Aquatic Invasive Species (AIS)?

Aquatic nuisance species (ANS) or aquatic invasive species (AIS) are also called non-native species, exotic species, non-indigenous species, noxious weeds, or pests. ANS can be plants or animals. Invasive aquatic plants are introduced plants that live either partially or completely submerged in the water and out-compete native species for light, space and nutrients creating a dense monoculture. Invasive aquatic animals also out-compete native species and require a watery habitat, but do not necessarily have to live entirely in water.

ANS plants and animals not only threaten native species but also interfere with recreational activities and municipal, industrial, commercial, and agricultural water supply, storage, and distribution. In their native environments, ANS populations are typically held in check and controlled by predators, parasites, pathogens, or competitors. However, when they are transported to a new environment, these natural checks are usually left behind. This gives invasive plants and animals an advantage over native species and makes them very difficult, if not impossible, to control. Long-term management of invasive species is costing the U.S.A. over \$200 billion a year (Pimentel et al 1996).

How are ANS defined?

“Aquatic Nuisance Species’ means exotic or non-native aquatic wildlife or any plant species that have been determined by the [Parks] Board to pose a significant threat to the aquatic resources or water infrastructure of the state.”

[Colorado Senate Bill 08-226 signed by Governor Bill Ritter Jr. in May 2008 (“ANS Act”).]

“A species that is: 1.) non-native (or alien) to the ecosystem under consideration and 2.) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.”

[Executive Order 13112 signed by President William Clinton on February 3, 1999 (“Invasive Species Act”)]

What is the purpose of this State Watercraft Inspection and Decontamination Training Curriculum?

As referenced in the ANS Regulation #800M, this document details the standard “WID [Watercraft Inspection and Decontamination] Procedures” that Colorado Authorized Locations [a.k.a. Inspection and Decontamination Stations] and Authorized Agents [a.k.a. Inspectors and Decontaminators] must adhere to.

The WID Procedures described in the following pages and taught in the CPW Training and Certification Course has been proven to reduce the risk of mussels and other ANS being introduced into our precious waters, through implementation of a risk-based prevention and containment program that has resulted in the interception of 830 infested mussel boats from 2009–2023.

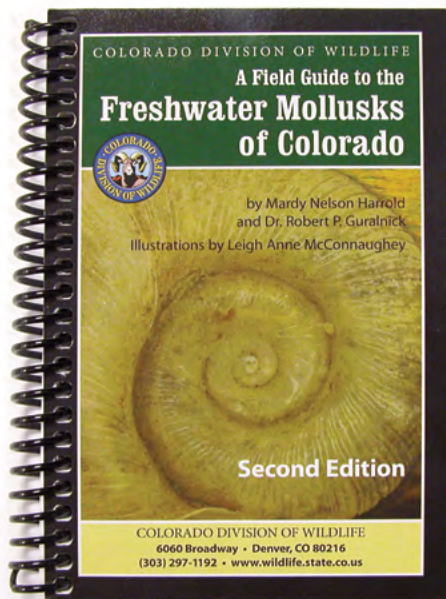
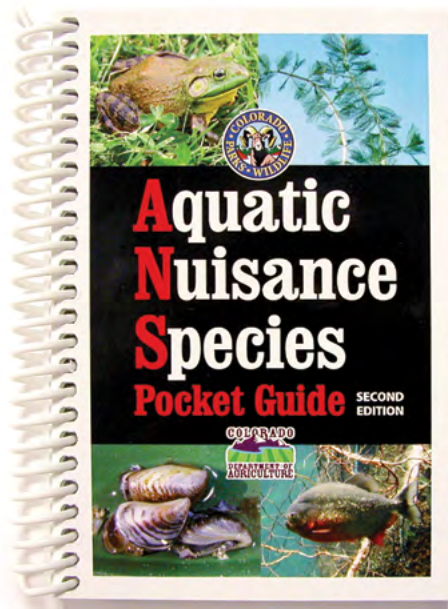
What ANS is Colorado concerned about?

While this handbook puts special emphasis on preventing introductions of two species that have the most significant economic, cultural and natural resource impacts—zebra and quagga mussels or ZQM—the procedures apply to all aquatic nuisance species, both plant and animal. The following table lists the ANS plants and animals prohibited in the ANS Regulation #800A:

ANIMALS	
Common Name	Scientific Name
Crayfish, rusty	<i>Faxonius rusticus</i> (also known as <i>Orconectes rusticus</i>)
Mussel, quagga	<i>Dreissena rostriformis bugensis</i>
Mussel, zebra	<i>Dreissena polymorpha</i>
New Zealand mudsnail	<i>Potamopyrgus antipodarum</i>
Water Flea, fishhook	<i>Cercopagis pengoi</i>
Water Flea, spiny	<i>Bythotrephes longimanus</i> (also known as <i>Bythotrephes cederstroemi</i>)

PLANTS	
Common Name	Scientific Name
African elodea	<i>Lagarosiphon major</i>
Brazilian egeria	<i>Egeria densa</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Giant salvinia	<i>Salvinia molesta</i>
Hyacinth, water	<i>Eichornia crassipes</i>
Hydrilla	<i>Hydrilla verticillata</i>
Parrotfeather	<i>Myriophyllum aquaticum</i>
Yellow floating heart	<i>Nymphoides peltata</i>

A comprehensive list and description of ANS that could negatively impact native species, recreation, or water resources is provided in the *Colorado ANS Pocket Guide* [CDOW and Colorado Department of Agriculture, 2010]. Additional information about zebra and quagga mussels, New Zealand mudsnails and other native and non-native mollusks can be found in the *A Field Guide to the Freshwater Mollusks of Colorado* [CDOW, 2011]. Chapter 3 titled “Other ANS” describes the highest priority invasive species. It is imperative that inspectors and decontaminations strive to prevent or contain introductions of all invasives by ensuring watercraft are clean, drained and dry—no mud, no mussels, no water, and no plants—before launching and after retrieval in Colorado waters.



State ANS Program Information

The CPW Invasive Species Program provides coordination and support for the management of all invasive species on CPW properties, which includes both terrestrial and aquatic plants and animals. However, the focus of the Invasive Species Program is on the statewide coordination of a partnership based ANS prevention and containment program.

Our Mission

“To protect wildlife, natural resources, recreation, infrastructure, agriculture and the economy by 1.) preventing the introduction of zebra and quagga mussels, and other invasive species, 2.) by containing current infestations and 3.) stopping the spread of invaders into new waters.”

Legal Authority

The State responded quickly to the increased threat of zebra and quagga mussels in the western US following the invasion of Lake Mead and some initial detections of juvenile microscopic mussels and eDNA in Colorado. The Colorado General Assembly passed the State ANS Act on May 29, 2008. The Act defines ANS and makes it illegal to possess, import, export, ship, transport, release, plant, place, or cause an ANS to be released. The Act created an ANS Fund in CPW for implementation.

The ANS Act provides authority to **Qualified Peace Officers** to inspect, and if necessary, decontaminate or quarantine watercraft for ANS. It provides authority for CPW to certify individuals as **“Authorized Agents”** (a.k.a. inspectors and decontaminators) to work at **“Authorized Locations”** (a.k.a. watercraft inspection and decontamination stations or WIDS)

for the purposes of inspecting and decontaminating watercraft to prevent new introductions and contain existing detections of ANS.

The Parks Board (now Parks and Wildlife Commission) passed regulations required by the Act on February 20, 2009. The regulations require mandatory watercraft inspection and decontamination, if necessary, of:

1. Watercraft coming in from out of state
2. Watercraft leaving a suspect or positive water in Colorado
3. Watercraft entering a high-risk water where inspections and decontaminations are required by the managing agency.

The ANS Regulations set the standard for certification, watercraft inspection, decontamination, impoundment, sampling, monitoring, identification, and reporting.

Following the passage of the ANS Regulations, CDOW published the State ZQM Management Plan. Implementation began in March 2009 and is ongoing today. The ZQM Plan outlines the statewide approach to zebra and quagga mussel management and mirrors the regulations. Implementation of the plan is partnership based and dependent on many entities to ensure a standardized and seamless approach across jurisdictions.

ANS Regulations

<https://cpw.state.co.us/Documents/RulesRegs/Regulations/ChP08.pdf>

Mussel Free Colorado Act

<https://leg.colorado.gov/bills/hb18-1008>

More Robust Check Stations Aquatic Nuisance Species Act

<https://leg.colorado.gov/bills/hb21-1226>

In 2021, the Colorado General Assembly passed the More Robust Check Station Aquatic Nuisance Species Act. This act provided Colorado Parks & Wildlife the authority to implement a pilot roadside watercraft inspection and decontamination program during the 2022 and 2023 boating seasons. It also prohibits persons transporting a conveyance from failing or refusing to stop at these check stations during the hours of operation.



In 2022, CPW, in collaboration with CDOT and Port of Entry Staff, implemented the first year of this pilot program at the eastbound Loma Port of Entry over the course of three days. This location was selected due to the high volume of boats traveling from Lake Powell towards Colorado. In total, 138 watercraft were inspected, 60 were decontaminated including 26 which were confirmed to have adult mussels. This initial effort has shown that the program can be effective at intercepting & decontaminating mussel fouled watercraft before they enter into the interior of the state. In 2023, CPW implemented a total of ten pop up roadsides throughout the state at Port of Entry and Welcome Centers coming into Colorado. While far fewer boats were inspected at these locations, they gave CPW key insight to possible boat traffic, and In 2024, CPW will look to implement permanent roadside locations in key high risk parts of the state.

Sampling/Monitoring

DEFINITIONS:

Gene Sequencing—A process for species identification using advanced molecular analysis.

Larval—The larvae or initial life stage of a zebra or quagga mussel (and *Corbicula fluminea* or other mollusks) is the free-floating infant stage of a mussel, also called a veliger.

Microscopic—Too small to be seen by the unaided eye but large enough to be studied under a microscope.

Microscopy—The science of examining and identifying organisms under the microscope.

Plankton—passively floating, drifting, or somewhat motile organisms occurring in a body of water, primarily comprising microscopic algae and protozoa. Often the bottom of the food chain.

PCR—Polymerase Chain Reaction—A process for amplification of DNA for species identification.

Plankton Tow—A cylindrical net with a fine mesh is dropped into a body of water to capture any plankton, veligers, or other organisms in the net, where it can then be analyzed in a lab.

Settlers—Or juvenile mussels. As a veliger grows out of the veliger or larval stage, it undergoes a metamorphosis. The animal begins to grow a shell and will settle onto a semi-hard or hard surface to finish developing. At this stage, the settlers will feel like sandpaper or grit.

Substrate—1.) A device used to monitor for the settler stage of zebra or quagga mussels, typically consisting of a black, rough PVC pipe suspended in the water body between a buoy at the surface and a weight at the bottom. 2.) The bottom of the water body, where organisms live—the benthos or benthic area.

Veliger—The free-swimming larva of a mollusk. During the veliger stage, the mollusk begins to develop a shell. They are microscopic at this state and can only be seen under a microscope.

For more than a decade, CPW has implemented a comprehensive early detection program for zebra and quagga mussels and other ANS. Waters were selected from a prioritization ranking resulting from a risk assessment, which was conducted specifically to determine the potential risk of introduction of zebra and quagga mussels. The risk assessment identified 168 total lakes and reservoirs, of which the sampling frequency varies from once per year to every 4 weeks depending on the risk level. Very high and high risk waters are visited every month. Medium risk waters are monitored 2–3 times per year and low risk waters are monitored 1–2 times per year. Streams and rivers are monitored on a rotating basis annually by need and priority as funding and resources allows.

CPW has sampled 584 “at-risk” waters for ANS. The state follows a three-tier sampling protocol and a three-phase identification process for the early detection of zebra or quagga mussels: 1.) Conducting plankton tows to find the veligers, 2.) Deploy and check substrates to find the juvenile “settlers” or attached adult mussels, and 3.) Conduct surveys along the shoreline and existing structures for settled juveniles or attached adult mussels. CPW ANS Crews also perform crayfish trapping, aquatic plant inventories, and stream surveys for early detection purposes, as well as long term monitoring of known invasive populations. The CPW ANS Program also catalogs native plants, mollusks and crustaceans detected for natural history inventory purposes.

Minimum Criteria for Detection

The Western Regional Panel standards for positive detection of zebra or quagga mussels is based on the minimum criteria for detection. Colorado follows these minimum standards and the state protocols are detailed below for each life stage.

- **Veligers**—The following tests must all be positive on the same sample:
 - Microscopy (visual ID of an animal)
 - PCR (genetic or molecular identification of the species)
 - Gene Sequencing (genetic or molecular confirmation of the species identification)
- **Settlers**—Taxonomic identification by two independent experts.
 - DNA analysis may or may not be required.

- *Adults*—Taxonomic identification by two independent experts.
 - DNA analysis may or may not be required.

There had never been any adult ZQM detected in Colorado’s waters until September 2022, when the first adult zebra mussel was detected at Highline Lake.

Water Body Classifications

Colorado adheres to the Western Regional Panel standards for water body classification related to early detection sampling and monitoring for zebra and quagga mussels. The definitions for detected waters are below:

- **Negative:** Sampling/testing is ongoing and nothing has been detected, or nothing has been detected within the time frames for de-listing.
- **Inconclusive (temporary status):** Water body has not met the minimum criteria for detection (e.g. a single eDNA hit).
- **Suspect:** Water body that has met the minimum criteria for detection.
- **Positive:** Multiple (2 or more) subsequent sampling events that meet the minimum criteria for detection.
- **Infested:** A water body that has an established (recruiting or reproducing) population.

De-Listing Standards

The Western Regional Panel standards also set timelines for de-listing detected waters, as detailed below. In adopting the regional standard Colorado de-listed Granby, Grand Lake, Shadow Mountain, Pueblo Reservoir in 2017 and Green Mountain Reservoir in January of 2021.

The timelines for de-listing are below:

- **Inconclusive:** 1 year of negative testing including at least one sample taken in the same month of subsequent year as the positive sample (accounting for seasonal environment variability) to get to undetected/negative.
- **Suspect:** 3 years of negative testing to get to undetected/negative.
- **Positive:** 5 years of negative testing to get to undetected/negative.
- **Infested:** Following a successful eradication or extirpation event including a minimum of 5 years post-event testing/monitoring with negative results.

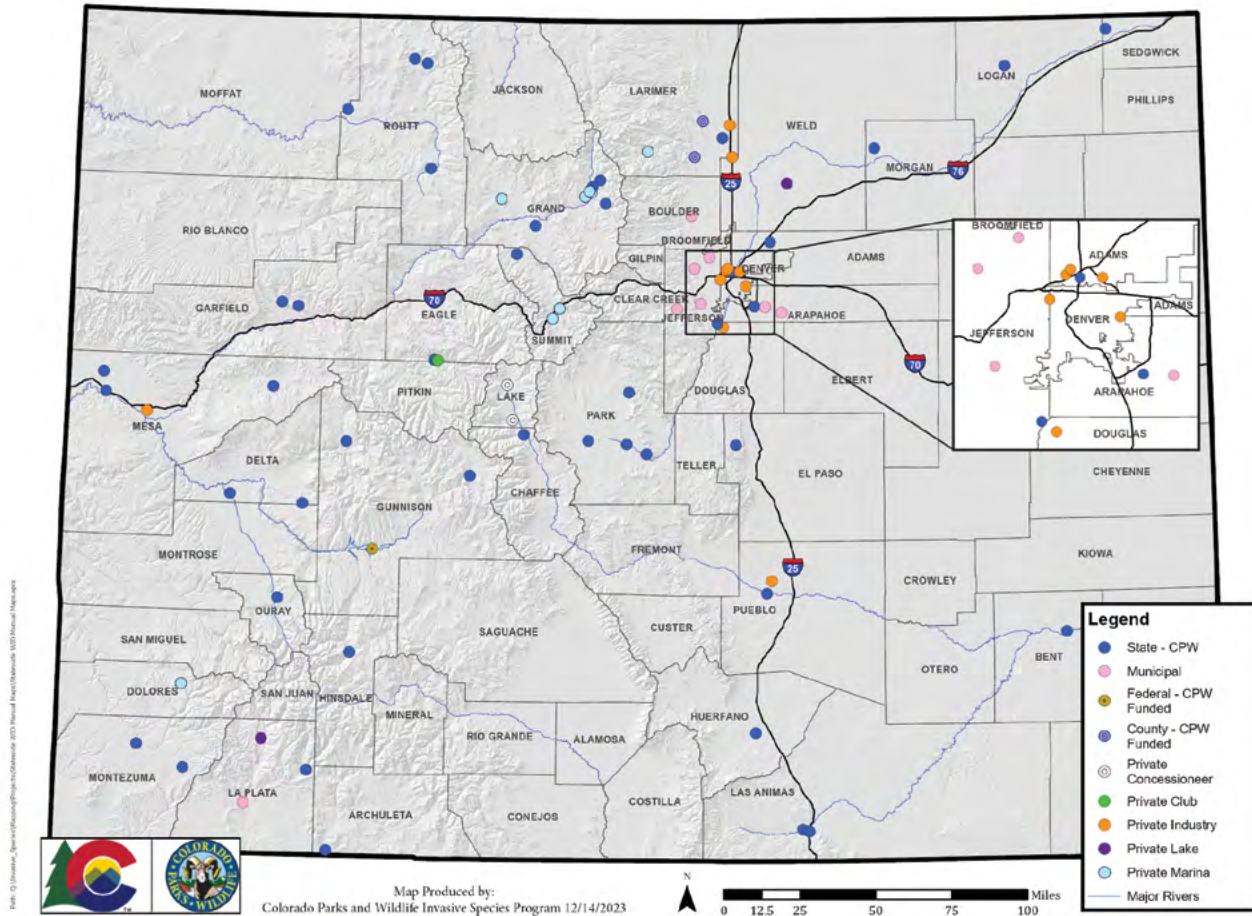
Watercraft Inspection and Decontamination (WID)

CPW coordinates a vast network of WID stations that are operated by CPW, the National Park Service, Larimer County, several municipalities, and numerous private industry locations including businesses, concessioners, marinas, clubs, and private lakes. In total, the state has collectively performed over 7 million inspections and 233,200 decontaminations since 2008.

Per the state ANS Regulations, trailered and motorized watercraft must submit to an inspection, and decontamination if needed, prior to entrance in Colorado’s waters following boating out of state or boating on a positive or suspect water. Boaters are also required to submit to an inspection prior to entering a water body where inspections are required by the managing agency. All persons performing inspections and/or decontaminations must be certified by CPW.

Number of Authorized Locations by Entity																	
Entity Type	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Colorado Parks & Wildlife	-	-	-	-	38	37	37	32	32	30	29	29	29	40	41	42	44
State Parks	24	28	28	28	-	-	-	-	-	-	-	-	-	-	-	-	-
Division of Wildlife	5	160	19	19	-	-	-	-	-	-	-	-	-	-	-	-	-
Larimer County	0	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2
Municipalities	3	7	11	9	8	8	8	8	8	7	8	8	9	8	8	8	8
National Park Service	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Private Industry	3	11	51	30	24	27	27	28	28	31	32	32	32	22	22	22	22
Total	35	209	112	89	73	74	75	71	71	72	72	72	73	73	74	75	77

Colorado Watercraft Inspection and Decontamination Stations for 2024



Types of Watercraft Inspection and Decontamination Stations

- **Negative Prevention Waters:** Waters that have never had a verified detection of any ANS or have not had a detection within the time frame for de-listing.
- **Other ANS Containment Waters:** Waters that are positive for an Other ANS. They have a verified presence of an ANS listed in Chapter 8 regulations other than zebra or quagga mussels. Most ANS Positive waters are also prevention waters for mussels and other ANS.
- **ZQM Containment Waters:** Waters that have had a verified zebra or quagga mussel detection.
- **Off Water Locations:** Authorized locations that are not located at a water body.

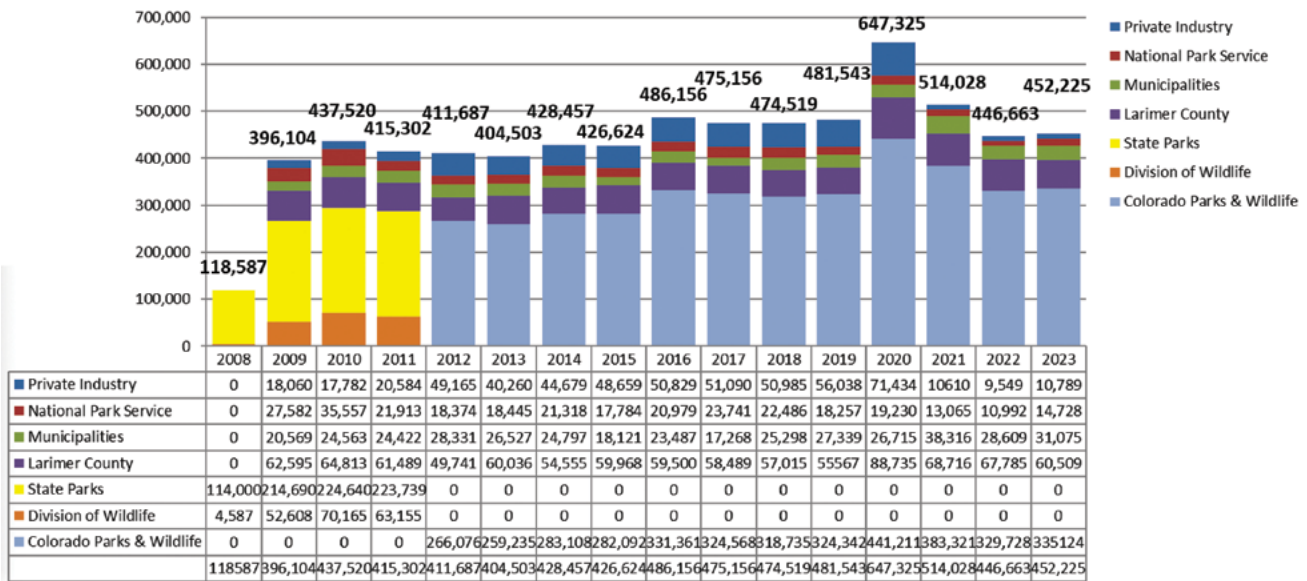
WID Training and Certification

CPW taught 28 WID certifications in 2023, in addition to maintaining an online recertification program for experienced inspectors and decontaminators. 25 classes were taught virtually

in 2023. 1,031 trainings have been given since the program's inception. In addition to the online course for experienced staff, the Invasive Species Program within CPW also provides two other specialized courses: (1) WID Trainer's certification and (2) Advanced Decontamination. CPW certified 736 individuals in 2023, for a total of 10,649 certified or re-certified to perform WID since the implementation of statewide training and certification program in 2009.

CPW currently has authorized 75 locations to perform watercraft inspection and decontamination. Of those, fourteen locations are operated as containment for other ANS. The focus of the containment program is to inspect watercraft leaving the lakes/reservoirs to prevent boats from moving ANS overland into currently uninfested areas, while maintaining prevention activities upon entrance to the reservoir. 61 locations operated as prevention locations. Prevention locations are those that are negative for all ANS or are not located at a waterbody (e.g. offices or marine dealers).

Statewide Inspection Numbers



Number of Inspections and Decontaminations Performed in Colorado

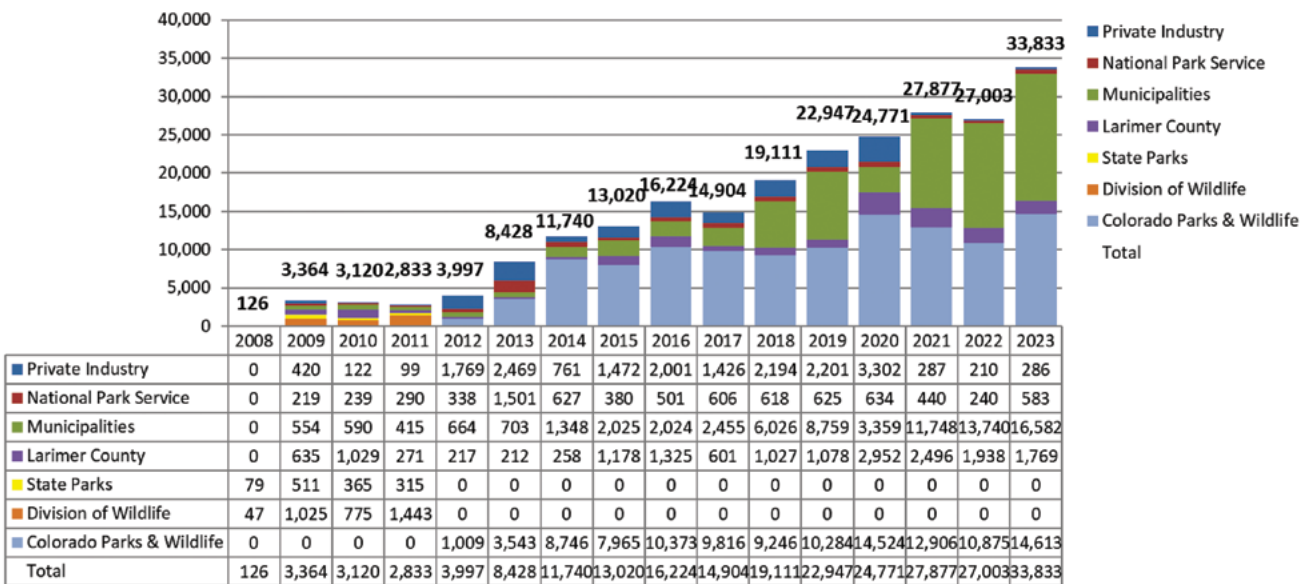
A total of 408,470 inspections and 16,913 decontaminations were performed in Colorado in 2023.

In total, the state has collectively performed over 7 million inspections and 233,200 decontaminations since 2008.

Why Are Decontaminations Increasing?

1. Research publications indicate zebra or quagga mussel veligers can survive up to 27 days in standing water on watercraft.
2. The increase in mussel infested waters in other states.
3. Waters in close proximity to, or positive for, NZMS and EWM infestations perform more decontaminations to limit their spread in state.

Statewide Decontamination Numbers



Mussel Boat Interceptions

In 2021 the state intercepted more watercraft with zebra or quagga mussels than ever before. All of these watercraft were fully decontaminated prior to being allowed into Colorado's waters. Since 2009, a total of 830 boats with adult zebra or quagga mussels were intercepted coming into Colorado.

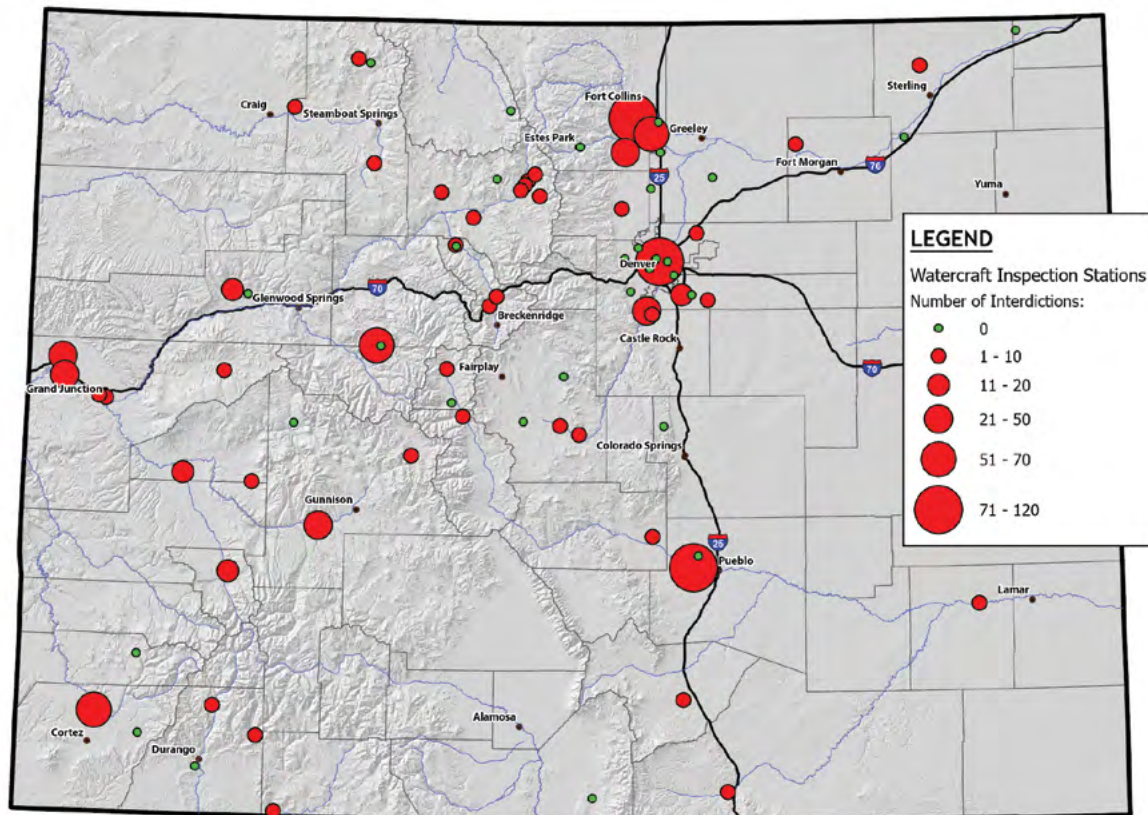
In the past, infested vessels have been intercepted at Aurora Reservoir, Barr Lake, Beacon Landing Marina, Blue Mesa, Boulder Marine, Boulder Reservoir, Boyd Lake, Canon Marine, Carter, Cherry Creek, Chatfield, Clear Creek, Crawford, Denver CPW Office, Dillon, Electra Lake, Elkhead, Eleven Mile, Frisco Bay Marina, Granby, Grand Lake, Grand Junction CPW Office, Great Lakes Marine, Green Mountain, Highline, Horsetooth, Indian Peaks Marina, Jackson, John Martin, Lathrop, Loma Port of Entry, McPhee, Navajo, North Sterling, Pueblo, Ridgway, Rifle Gap, Roadside (SW Colorado), Ruedi, Shadow Mountain, Spinney Mountain, Stagecoach, Steamboat Lake, Strontia Springs, Sundance Marina, Sweitzer, Taylor Park, Trinidad, Turquoise, Vallecito, Vega Reservoir and Williams Fork.

The infested vessels were coming from Arizona, California, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Michigan, Minnesota, Mississippi, Missouri, New York, Nevada, Oklahoma, Ohio, Pennsylvania, South Dakota, Tennessee, Texas, Utah and Wisconsin. The majority of intercepted vessels were coming from Lake Powell, as well as Arizona, the Great Lakes, and the Mississippi River States. All boats were fully decontaminated to ensure all mussels were dead, and no mussels were visibly attached to the vessel.

WID Quality Control

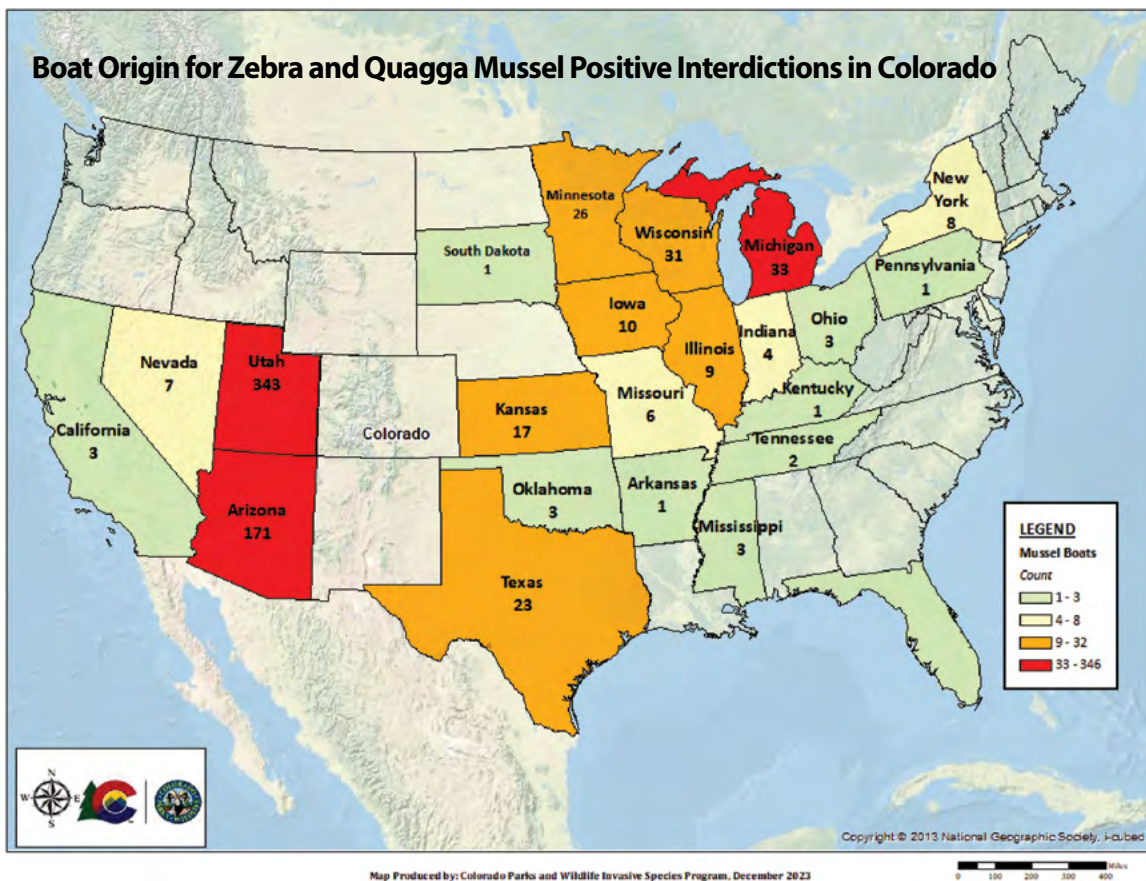
The CPW Quality Control and Field Support Team perform quality control evaluations annually at state certified watercraft inspection and decontamination stations to ensure that standard procedures are being followed, per regulatory requirements in #802-805. The team also ensures that stations are stocked with educational materials and provide on the job training to inspectors and supervisors. The quality control program consists of secret shopper evaluations, announced evaluations, on the job training, and customer service evaluations.

Zebra and Quagga Mussel Positive Interdiction Sites in Colorado



Map Produced by:
Colorado Parks and Wildlife Invasive Species Program, 12/19/2023





State Fish Hatchery Program and Aquatic Biologists

To date, invasive mussels have not been identified in a Colorado hatchery. Proactive measures have been put in place statewide to protect hatcheries and state waters from an invasive species introduction. Those measures include Annual Fish Health Inspections, Hazard Analysis Critical Control Point (HACCP) Plans, Trainings, and Workshops. Statewide preventative measures also include implementation of standardized disinfection protocols for wild spawn, fish transfers, and egg transfers. CPW explored methodologies for disinfection for fish being transported from Pueblo Fish Hatchery despite the hatchery never testing positive for mussels. For wild spawn operations, specialized trailer units have been constructed for all wild fish spawning operations to ensure no ANS are transported. Biologists have decontamination units, and are required to decontaminate work boats and equipment in between each use.

CPW ANS Sampling Staff

ANS Sampling Crew members are WID Stage II Authorized Agents and are required to fully decontaminate their watercraft, trailer, and gear in between each and every use. They will seal their boats and issue receipts upon completion of the full decontamination. The Invasive Species Program Office supervises the sampling crews and hold them to strict decontamination standards. They are instructed to stop at the inspection stations and provide the inspector their seal receipt. Please work together as a team with them and get the crews on the water fast to conduct ANS sampling, versus wasting ANS dollars by having them sitting in long lines or being re-inspected following a full decontamination.

Western Regional Activities

Western state programs are connected and working together to provide more communication and coordination between WID stations. All states in the West now have ANS Programs. Unfortunately, many states are underfunded and understaffed.



Education and Outreach

Education and Outreach is the **MOST** important thing! There will never be enough money to have Authorized Agents on all boat ramps all the time. Each inspection is a face-

to-face opportunity to educate the boater and change their behavior by teaching them to clean, drain, dry every time they boat. Consistency in messaging is key for boaters to learn Clean, Drain, Dry!

The CPW ANS Program trains almost 800 individuals per year, and it is the inspector's job to train the 85,000+ registered Colorado boaters through repeated face-to-face educational contacts on the boat ramps while doing 400,000+ inspections per year.

There are many educational tools to help you. Spend time learning the text of CPW provided brochures and signage so that all Agents provide consistent information to the public. Provide a 'Boaters Guide to ANS Inspections' brochure immediately upon making contact with the boat operator. There are also handouts on specific topics, rack cards for anglers



and divers, youth materials, and standard signage available. Display mussel props on busy weekends and show them to boaters to demonstrate the importance of keeping our state free of ANS.



WID Supervisors Meeting January 2023

Chapter 1 Review Questions

1. What are Aquatic Nuisance Species (ANS)?

2. What two ANS is Colorado the most concerned about?

3. The mission of the CPW Invasive Species Program is to protect wildlife, natural resources, recreation, infrastructure, agriculture and the economy by:

- a. Preventing the introduction of ZQM and other invasive species
- b. Containing current infestations/introductions
- c. Stopping the spread of invaders to new waters
- d. All of the above

4. The ANS regulations require mandatory watercraft inspection and decontamination, if necessary, of watercraft that:

- 1.) _____
- 2.) _____
- 3.) _____

5. Fill in the blank next to the following definitions with the letter of the corresponding classification.

- A. Inconclusive B. Positive C. Suspect D. Infested E. Negative

___ Testing is ongoing and no evidence of *Dreissena* mussels has been discovered.

___ eDNA detection with no confirmation (one hit wonder).

___ One verified detection of mussel veliger or adults.

___ More than one verified detection of mussel veliger or adults.

___ A reproducing and recruiting population of mussels is established.

6. Why is education the most important aspect of being an inspector?

- a. So that boaters learn to keep their boats and equipment clean, drained, and dry, and do it themselves without inspectors every single time.
- b. Because the state cannot put inspectors on all of the reservoirs in Colorado all the time.
- c. The best way to change a behavior is through education.
- d. All of the above

7. CPW operates all of the WID stations in Colorado. (circle one) True or False

8. Which Colorado fish hatcheries have tested positive for mussel veligers?
- Leadville National Hatchery
 - Mt. Shavano Hatchery
 - Pueblo Hatchery
 - No** hatcheries in Colorado have ever tested positive for invasive mussels.
9. Name the four types of WIDS:
- _____
 - _____
 - _____
 - _____
10. How many invasive mussel boats have been intercepted since 2009? _____
11. Fill in the blanks below regarding state protocols to positively identify mussels.
- Veligers—the following tests must be on the same sampler.
 - _____ (visual ID of an animal)
 - PCR (genetic or molecular identification of the species)
 - Gene Sequencing (genetic or molecular confirmation of the species)
 - Settlers—Taxonomic identification by _____ independent expert(s)
 - Adults—Taxonomic identification by _____ independent expert(s)
12. How many years of negative testing does it take to de-list a suspect reservoir? _____
13. How many years of negative testing does it take to de-list a positive reservoir? _____
14. It is the inspector's job to educate every boater and customer about how they can help to prevent invasive species? (circle one) True or False
15. What are the three reasons that decontaminations are increasing?
- _____
 - _____
 - _____
16. What water body are the majority of infested mussel boats coming from? _____
17. Please describe why you think it is important to prevent the introduction of zebra or quagga mussels, and other ANS, into Colorado's waters.
- _____
- _____
- _____
- _____
- _____

Chapter 2 Zebra and Quagga Mussel Biology



Chapter 2: Zebra and Quagga Mussel Biology

It is important to understand the biology and ecology to answer questions from the public and partner agencies and to be best equipped to find ZQM attached to watercraft or equipment. The Colorado program is grounded in the biology of this species.

- For example, all watercraft must be cleaned (to prevent moving adults or settlers), drained and dry (to prevent moving veligers in water).
- Another example is how Colorado performs early detection for mussels in Colorado (plankton tows for veligers, substrates for settlers and shoreline surveys for adults).
 - We know that mussels can be light sensitive and begin establishment in the depths of the water where we physically can't get to. Therefore, efforts are prioritized to detect veligers in the water column with the goal of detecting the introduction, and not the invasion that happens years later. This enables managers to contain the spread to other waters by stopping mussels from hitchhiking on, or in a watercraft.



Zebra Mussel

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Quagga Mussel



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DEFINITIONS:

Benthic—Refers to the bottom of a water body.

Byssal threads—A spider-web like appendage that enables the zebra or quagga mussels to attach to surfaces. Native species do not have byssal threads.

Dreissenids—A term referring to all species in the genus Dreissenid which includes zebra and quagga mussels.

Exotic—An exotic species is a species that is not native to a given environment. Exotic species often invade an ecosystem displacing or destroying the native plants and animals.

Macrophytes—An aquatic plant, large enough to be seen by the naked eye.

Maturation—The action or process of maturing.

Metamorphosis—The process of transformation from an immature form to an adult form in two or more distinct stages.

Non-Native/Non-Indigenous—A species that has been introduced to a new environment, either intentionally or unintentionally. It is out of its native range.

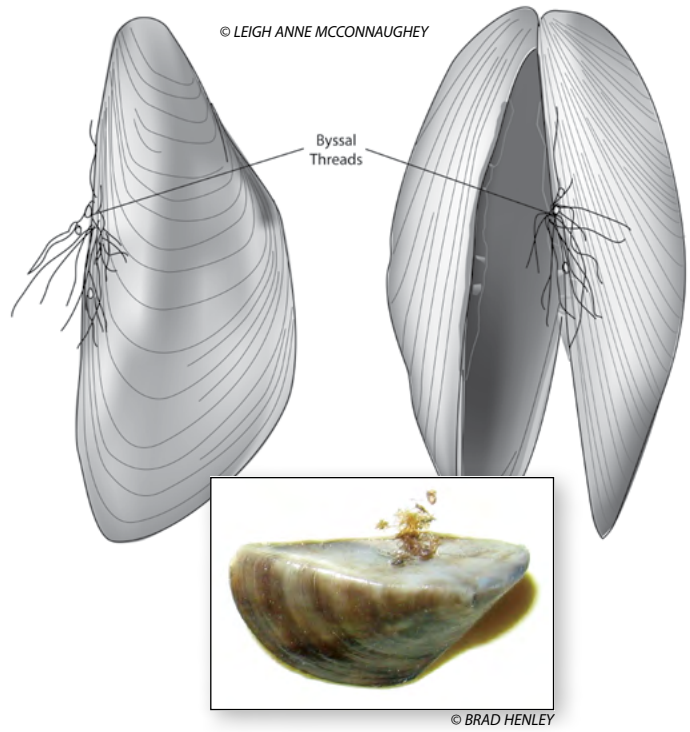
Phytoplankton—Plankton consisting of microscopic plants in water.

Water Column—The concept of the entire water depth of a water body, from its bottom (benthic zone) to the water surface.

Zooplankton—Plankton consisting of microscopic animals in water.



Actual Size



Identification

Quagga mussels (*Dreissena rostriformis bugensis*) and zebra mussels (*Dreissena polymorpha*) are small freshwater bivalve mollusks (animals with two shells). They are relatives of clams and oysters. It is very difficult for a non-expert to tell the two species apart. The shell color of both mussels alternate between a yellowish and darker brown, often forming stripes. Color patterns are highly variable and can be attributed to environmental factors. They range in size from microscopic up to about two inches long.

Several diagnostic features aid in identification. Quagga mussels have a rounded angle, or carina, between the ventral and dorsal surfaces. They also have a convex ventral side that can sometimes be distinguished by placing the shells on a flat surface. The quagga mussel will topple over when stood on its ventral side, whereas a zebra mussel will not topple due to its triangular shape. Quagga mussels also have a small byssal groove on the ventral side near the hinge. They also have asymmetrical valves when viewed from the front or ventral side.

Unlike native North American freshwater mussels, which burrow in soft sediment, adult zebra and quagga mussels can attach to most hard and semi-soft surfaces via tiny threads called byssal threads. **Native species do NOT have byssal threads!** These **byssal threads** are one of three main invasive characteristics that give zebra and quagga mussels an advantage over natives, along with **rapid reproduction** and their ability to **filter feed** at amazing rates.

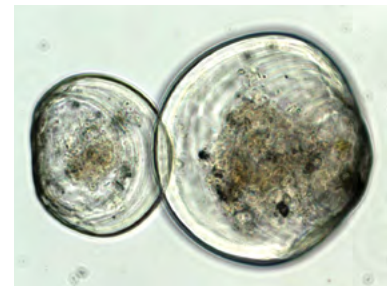
Ecology of Zebra and Quagga Mussels

Both zebra and quagga mussels can survive cold waters, but cannot tolerate freezing. They can endure temperatures between 1°–30°C (33°–86°F). Zebra mussels need waters above 12°C (54°F) to reproduce, while quagga mussels can reproduce in waters as cold as 9°C (48°F). Adult mussels are light sensitive and prefer to live in water around 200 to 300+ feet deep. They are able to thrive in a wide range of conditions including oxygen-depleted water.

Life Cycle

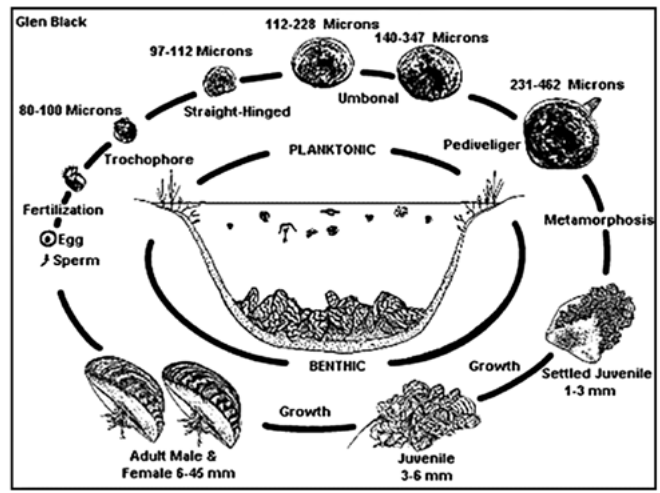
It is important that inspectors understand the life cycle of ZQM because the inspection, decontamination, and sampling protocols are based on their biology. ZQM have three life stages; (1) veliger, (2) settler and (3) adult.

1. The embryos are microscopic larvae, called **veligers**. They are free-floating plankton in the water column and impossible to see with the naked eye. The veligers float in the water column or are carried in the current for about four to eight weeks.



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- The veligers undergo metamorphosis and develop shells while settling out of the water column onto a solid surface (which could include a grain of sand or the skin or shells of native aquatic species). This juvenile form of the mussel is known as the **settler** stage. At this point in their life cycle, they settle into the deep benthic zone of the water column.
- Upon maturation, **adult** mussels become sessile, meaning fixed in one place or immobile. They are attached semi-permanently with their byssal threads. Adult mussels typically form dense clusters in which they pile up on top of each other essentially smothering the generation beneath them. Their typical lifespan is four to five years.



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How Did They Get Here?

Many aquatic nuisance species, including zebra and quagga mussels, were introduced into the Great Lakes in the discharged ballast water of ocean-going ships. Another method of dispersal from Europe to the United States is through the transportation of attached mature adults on anchors stored internally in compartments on transoceanic vessels. Aquatic nuisance species often hitch rides to other bodies of water on the boats, trailers, and equipment that people transport from place to place. Boaters and anglers can inadvertently transport ANS on waders and in bait buckets and live wells.

Zebra and quagga mussels likely made their way to the Western USA on trailered recreational watercraft. The first discovery west of the 100th Meridian was in Lake Mead. The invasive quagga mussels found in Lake Mead in 2007 were 1,000 miles farther west than any other known colony of quagga mussels at the time. The primary method of overland dispersal of these mussels is through human-related activities, especially trailered watercraft. Given their ability to attach to hard surfaces and survive out of water for extended periods [30 days!], many infestations have occurred by adult mussels hitching rides on watercraft. The microscopic larvae also can be transported in bilges, ballast water, live wells, or any other equipment that holds water.

Where Do Mussels Like to Hide?

- Right Angles
- Dark Places
- Moist Places
- Rough Surfaces



Where Did They Come From?

Zebra mussels are native to the Black, Caspian, and Azov Seas of Eastern Europe. They were discovered in the Great Lakes in Lake St. Clair in 1988 and have since spread to 31 states in the United States. Quagga mussels are native to the Dnieper River Drainage in the Ukraine. They were discovered first in the Great Lakes in the Erie Canal and Lake Ontario in 1989 and have since spread to 34 states in the United States.

Where Are Mussels in Colorado?

Adult zebra mussels were found for the first time in Colorado at Highline Lake in September 2022. Highline Lake is considered infested due to the finding of several adult mussels.

History of Zebra and Quagga Mussels in Colorado

There had never been an adult zebra or quagga mussel found in a Colorado water body before 2022.

Colorado follows the western regional standards for listing and de-listing water bodies for zebra and quagga mussels, as documented in the *Western Regional Panel's Building Consensus in the West Workgroup: Final Summary Report 2011–2019*.

Previous Detections of Zebra and Quagga Mussels in Colorado:

Pueblo Reservoir tested positive for zebra and quagga mussel veligers in 2007 and for quagga mussel veligers in 2007, 2008, 2009 and 2011.

Grand Lake tested positive for one zebra mussel and one quagga mussel veliger in 2008. There have been no verified detections at Grand Lake since 2008.

Granby Reservoir, Shadow Mountain Reservoir, Willow Creek Reservoir, Tarryall Reservoir, and Jumbo Reservoir all tested positive for one quagga mussel veliger in 2008. There have been no verified detections at any of these waters since 2008.

Blue Mesa Reservoir tested positive for quagga mussel eDNA in 2009, 2011 and 2012.

Green Mountain Reservoir tested positive for quagga mussel veligers in 2017.

Highline Lake was discovered to have several adult zebra mussels in 2022 and is currently considered infested.

De-Listing Positive Waters:

Green Mountain was de-listed for quagga mussels in January 2021 following three years of negative results.

Pueblo Reservoir was de-listed for quagga mussels in January 2017 following five years of negative results.

Pueblo Reservoir was de-listed for zebra mussels in January 2014, along with the de-listing of *Granby, Grand Lake, Shadow Mountain, Willow Creek, Tarryall, Jumbo, and Blue Mesa*.

Impacts

Zebra and quagga mussels pose a great ecological and financial threat to the state. The invasion of these mussels can affect every Coloradoan and visitor in some way with devastating impacts.

Why Be Concerned?

- Ecological Impacts
- Recreational Impacts
- Economic Impacts
- Social Impacts
- Industrial Impacts
- Agricultural Impacts

Invasive Characteristic #1

Prolific Reproduction—Zebra and quagga mussels reproduce exponentially. They can spawn year-round if conditions are favorable. A single female mussel can produce up to one million eggs a year! If only ten percent of the offspring survive, there would be ten septillion mussels in the waterway at the end of five years! As the mussel population explodes, they cover the bottom and sides of a waterway.

Invasive Characteristic #2

Byssal Threads—As mentioned before, zebra and quagga mussels can attach via byssal threads to any stable substrate in the water column such as rocks, aquatic plants, artificial surfaces (cement, steel, rope, etc.), crayfish, native clams, and other mollusks. They attach to most underwater structures and can form dense clusters that impair facilities and impede the flow of water. They clog intake pipes and trash

screens, canals, aqueducts, and dams—disrupting water supply to homes, farms, factories, and power plants. Zebra and quagga mussels also degrade water quality and can alter the taste and smell of drinking water.

Invasive Characteristic #3

Filter Feeding—Ecological Impacts—Invasive species have the ability to change aquatic ecosystems and native plant and animal communities. As filter feeders, these species remove large amounts of microscopic plants and animals that form the base of the food chain, leaving little or nothing for native aquatic species. The amount of food the mussels eat and the waste they produce has life-altering effects on the ecosystem and can harm fisheries. ZQM attach to and encrust native organisms, essentially smothering them and removing them from the food chain. Zebra and quagga mussels are one of the few species that have the ability to crash the entire food web by removing the base of the food chain—plankton—and by smothering benthic organisms that are a source of food for larger fish.

Zebra and quagga mussels are able to remove substantial amounts of phytoplankton and suspended particulate from the water. Each mussel can filter over a liter of water per day. They decrease the availability of food for smaller life forms, which in turn increases water clarity, elevating the amount of light penetration causing an increase in vegetation and a shift in species dominance, which potentially alters the entire ecosystem permanently.

Filter feeders reject unwanted mucous covered food from their body known as pseudofeces. Pseudofeces accumulate and create an unsuitable environment. As waste from the mussels decomposes, oxygen availability is depleted, and the pH becomes very acidic causing toxic byproducts to be produced. The accumulation of organic pollutants within the tissue of the mussel is passed up the food chain, causing increased exposure by wildlife.



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Recreational impacts.

Invasive mussels encrust docks and boats. Attachment of mussels can cause corrosion of steel and concrete affecting its structural integrity. Attached mussels increase drag on boats and can even sink navigational buoys with their weight. Veligers or settlers can get sucked up into the engine cooling system and clog the engine from the inside causing it to overheat and be damaged. Increased hull and motor fouling will result in increased maintenance costs on vessels moored for long periods of time. Zebra and quagga mussels also impact fish populations and reduce sport-fishing opportunities. Their sharp shells can cut the feet of unsuspecting swimmers and beach goers.

Economic impacts.

As maintenance costs for power plants, water treatment facilities and water delivery infrastructures increase following a mussel infestation, so does the cost of food and utilities. In the Great Lakes area, maintenance costs for water treatment plants, power plant intakes and dams have been in the billions of



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dollars. The destruction of native fisheries causes a wider economic losses in terms of tourism and recreation dollars not spent. Marinas and watercraft dealers could suffer business declines.

Management

There are very few viable, cost effective, and environmentally friendly control mechanisms.

If watercraft are cleaned, drained, and dried in between water bodies, the risk of transporting attached mussels or other ANS will be eliminated.



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The rapid invasion of United States waterways has been attributed to the mussel's ability to disperse during all stages of its life. Mussels can spread to other bodies of water by attaching to watercraft hulls and anchors, trailers, and fishing equipment.

Larvae can be transported in bilge water, ballast water or live bait wells. Mussel larvae also disperse naturally, and can be carried by water currents to other lakes or reservoirs downstream or through water diversions.

Since there are no viable control methods once mussels are introduced in open water bodies, prevention is our only defense. As a watercraft inspector, **your most important task is educating the public** both coming into and exiting your lake or reservoir. Many lakes and reservoirs in the state will not have inspections, therefore, it is essential that you:

1. Show the boaters how to inspect their boats themselves.
2. Explain why inspection is critical to find mussels and other ANS.
3. Impress on the boater how zebra and quagga mussels damage boats, ruin fishing opportunities, harm the environment and impair water infrastructure.

You need to drive home the primary educational message to **Clean/Drain/Dry** and explain why boaters need to do it **each time** they use their craft. Teaching boaters and anglers to clean, drain, dry their boats and gears themselves in between each and every launch is invaluable! If boaters and anglers do this, mussels will not spread!

Outdoor Session—How Many Mussels Can You Find?



List the names of locations you find mussels on the watercraft.

Chapter 2 Review Questions

1. Why is it important to learn ZQM biology?

2. Which are the three characteristics of zebra and quagga mussels that make them invasive?

- Grow larger than most other mollusks, reproduce quickly, clear the water
- Attach with byssal threads, rapid reproduction, filter feeding
- Alter water chemistry, attach with byssal threads
- Feed on aquatic weed beds and reduce native plant communities, attach with byssal threads, prolific or rapid reproduction

3. The larval life stage of a mussel in which they are a free-floating planktonic organism is called a _____. These juveniles then begin to develop shells and attach to solid surfaces which is known as the _____ stage. Upon maturation, _____ mussels are sessile, meaning fixed in one place or immobile.

4. In addition to ecological impacts ZQM and other ANS cause major _____ and _____ impacts to the state.

5. Because many lakes and reservoirs in the state will not have inspections, it is essential to:

- Show the boaters how to inspect their boats themselves
- Explain why inspection is critical to find mussel settlers and other ANS
- Impress on the boater how zebra and quagga mussels damage boats, ruin fishing opportunities, harm the environment and impair water infrastructure
- All of the above

6. Where do mussels like to hide on watercraft?

_____ angles, _____ or _____ places. _____ surfaces.

7. Mussel veligers are microscopic and can be transported in standing water. (circle one) True or False

8. What is the primary message we want boaters to learn?

9. Which waterbody in Colorado is infested for zebra mussels in 2024?

- Highline Lake
- Tarryall Reservoir
- Pueblo Reservoir
- Green Mountain Reservoir
- Cherry Creek Reservoir
- None of the Above

10. Which waterbody in Colorado is suspect for zebra mussels in 2024?

- Highline Lake
- Tarryall Reservoir
- Pueblo Reservoir
- Green Mountain Reservoir
- Cherry Creek Reservoir
- None of the Above

11. How many waters in Colorado are infested for zebra mussels?

- 7
- 8
- 1
- 0
- 5

Chapter 3 Other ANS Biology



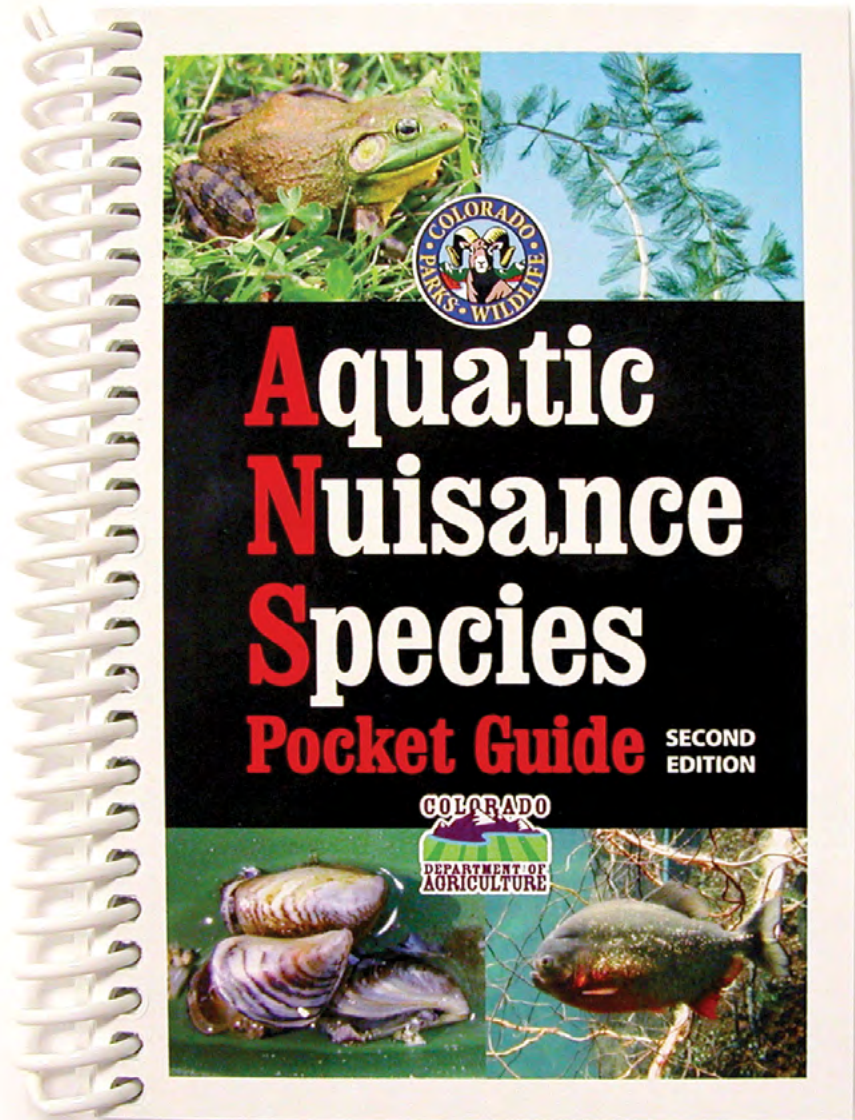
Chapter 3: Other ANS Biology

As you learned in the introduction module, there are many species of aquatic plants and animals that are invasive. The watercraft inspection and decontamination program prevents ANS from being introduced into new waters.

Boat inspectors have detected New Zealand mudsnails, Eurasian watermilfoil, and rusty crayfish in the past. While zebra and quagga mussels are the highest priority, this program is aimed at protecting the state's resources from all invaders being transported on watercraft.

CPW developed and published the *Aquatic Nuisance Species Pocket Guide* in partnership with the Colorado Department of Agriculture. This booklet combines the various prohibited species lists into a single book that instructs the reader how to report the species if they were to find it.

- **Eurasian watermilfoil (EWM)**—An invasive aquatic plant known to many Front Range locations, Navajo Reservoir, and the Rio Grande. The Colorado Dept. of Agriculture requires management per the State Weed Act and Rules.
- **New Zealand Mudsnails (NZMS)**—First detected in Colorado in 2004 in the South Platte and Boulder Creek. These invasive snails continue to be found in new locations annually. The most recent detections were made in the Colorado River near Parachute, the Highline Canal near Palisade, and the Arkansas River.
- **Rusty Crayfish**—There are four known locations statewide. Regulation prohibits the live transport from positive locations, in addition to all waters west of the Continental Divide where there are no native crayfish. The most recent detection of rusty crayfish was in Lake Granby, in the Fall of 2023.



Corbicula fluminea

A Zebra/Quagga Mussel “look-alike” Invader

Corbicula fluminea are small non-native bivalves that are commonly mistaken for zebra and quagga mussels in Colorado. They are often observed littering shorelines and beaches with shells. Its shells have striations (or ridges) which give it the appearance of having stripes.

Corbicula fluminea

- Ridges or Striations on Shells
- Does Not Have Byssal Threads

Zebra or Quagga Mussels

- Smooth Shells with Stripes or Colorations
- Has Byssal Threads

Identification: Adults can reach 50 to 65 mm in length, although 25 mm is typical. Shell is oval, but not elongated, and is deep on the hinge side. The outer layer of shell has well defined, thick growth rings and varied coloration. Older clams have a darker colored shell, while younger clams are lighter brown or tan.

Habitat: They prefer fast moving water because currents provide food for these suspension feeders. However, they are commonly found on the shorelines of lakes and reservoirs.

Pathway of Introduction and Spread: *Corbicula fluminea* is used in Asia as a food source and may have been cultivated in the United States. It is also used for fish bait, which is probably another way it has been spread throughout North America. It is sold in the aquarium trade as “pygmy clam”, or “golden clam.”

Impacts: The *Corbicula fluminea* invasion in North America has created problems for power plants and water canals because large numbers of clams block water intake valves. They also compete with native bivalves for food, and competition increases as *Corbicula fluminea* populations explode.

Current Status in Colorado: *Corbicula fluminea* has experienced great success in North America and is moving through Colorado rapidly. *Corbicula fluminea* were first detected in the South Platte River in Colorado in 1993 and have since expanded their range to include the Arkansas River, Gunnison River, San Juan River and Colorado River basins (Cordeiro et al, 2007).



Corbicula fluminea

Quagga Mussel



Corbicula fluminea

Zebra Mussel

Quagga Mussel

New Zealand Mudsnail (*Potamopyrgus antipodarum*)

New Zealand mudsnails (NZMS) are small aquatic snails native to fresh waters of New Zealand. They were first discovered in North America in the late 1980s in the Snake River, Idaho and Madison River, Montana.

Identification: NZMS range in size from a grain of sand to 1/8 inch in length and are black or brown in color. The shell has about 5 1/2 spirals. If the shell is held tip up with the opening toward you, the opening is on the right. There is an attached operculum (cover) which can close off the opening.

Habitat: Found in freshwater, brackish, or saline waters with almost any substrate. Populations in saline conditions produce fewer offspring and grow more slowly. NZMS also tolerate a wide range of temperatures, ranging from near freezing to 82°F.

Pathway of Introduction and Spread: New Zealand mudsnails are spread into new river systems primarily by humans, although they can be carried on the feet of dogs and wildlife. Anglers, boaters, researchers, and others can carry NZMS to uninfested locations on

their boots and gear. They can survive up to 50 days on a damp surface, giving them ample time to be transferred from one body of water to another on fishing gear.

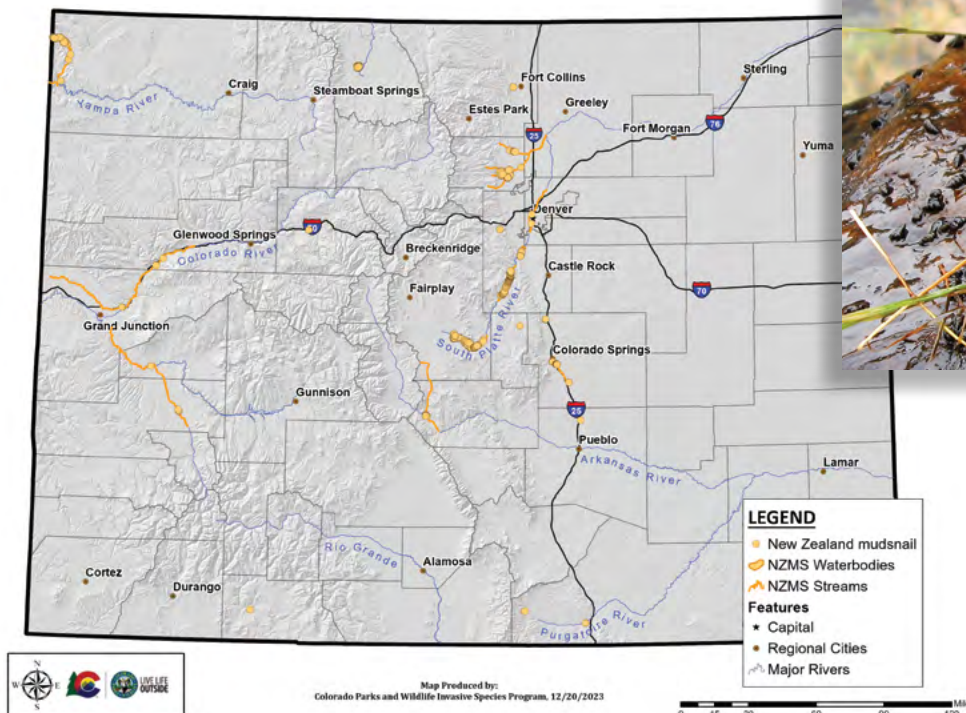
Impacts: NZMS compete with native invertebrates, including native mollusks, for space and food resources. NZMS may reduce the availability of native invertebrate prey for fish—particularly mayflies, caddis flies, and chironomids. They are not a viable food sources themselves because their hard shell allows them to pass through a fish gut unharmed.

Current Status in Colorado (See Map): Known populations have been mapped and are being monitored for long-term impacts. There are no viable control methods.



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New Zealand Mudsnail Distribution for 2024



Rusty Crayfish

(*Faxonius rusticus* or *Orconectes rusticus*)

Rusty crayfish are native to the Ohio River Basin. They were first discovered outside of their native range in the 1960s.

Identification: Rusty crayfish grow up to five inches long. They have brown bodies and large grayish-green to reddish-brown claws with dark black bands on the tips. There are two rusty patches on either side of the crayfish's body. The claws, when closed, have an oval gap in the middle. The moveable claw is smooth and S-shaped. Males tend to be larger than females.

Habitat: Found in freshwater lakes, rivers, and streams. Prefer deep pools and fast currents with cover from predators.

Pathway of Introduction and Spread: Introduced by anglers who use the crayfish as bait and throw unused bait into the water and illegally stocked as a prey base for a fishery. Although they are often introduced as bait, they do not make good bait due to their aggressive nature.

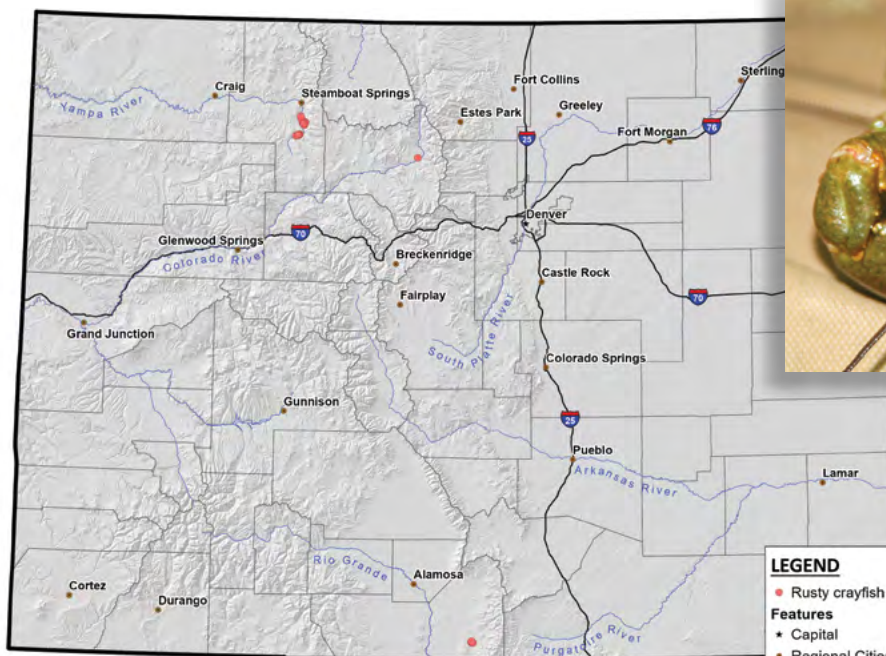


Impacts: Rusty crayfish eat small fish, insects, and fish eggs. They also eat aquatic vegetation, damaging underwater habitat that is important for fish spawning, cover, and food. They are aggressive and displace native crayfish.

Current Status in Colorado (See Map):

Rusty crayfish were first detected in Colorado in the Yampa River and Catamount Reservoir in 2009, in Sanchez State Wildlife Area in 2010, in Stagecoach Reservoir State Park in 2011, and most recently in Lake Granby in 2023. Populations have been controlled through mechanical and physical harvesting.

Rusty Crayfish Distribution for 2024



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Map Produced by:
Colorado Parks and Wildlife Invasive Species Program, 12/20/2023

0 15 30 60 90 120 Miles

Eurasian Watermilfoil

(*Myriophyllum spicatum*)

Eurasian watermilfoil is native to Europe, Asia, and northern Africa. It was once commonly sold as an aquarium plant and was introduced to the eastern U.S. at least as long ago as the 1940s, but it may have arrived as early as the late 1800s.

Identification: Eurasian watermilfoil is a submerged, rooted perennial with long, branching stems and soft feathery leaves attached in whorls of four. Each leaf has 12 to 21 pairs of leaflets, which are closely spaced, and about ½ inch long. Eurasian watermilfoil produces small yellow, four-parted flowers on a spike that projects two to four inches above the water surface.

Habitat: Tolerates a wide range of water conditions and depths; prefers nutrient-rich substrate.

Pathway of Introduction and Spread: Eurasian watermilfoil reproduces by seeds, fragmentation, and winter buds. Fragmentation and winter buds are believed to be more important in spreading the plant. Any plant fragment can start a new infestation. Winter buds are tight leaf clusters that break off and fall to the bottom, where they overwinter. In the spring, the buds grow and form new plants.

Impacts: Eurasian watermilfoil forms dense mats that restrict swimming, fishing, and boating, and clog water intakes. The mats alter water chemistry by choking and shading out other native aquatic plants.

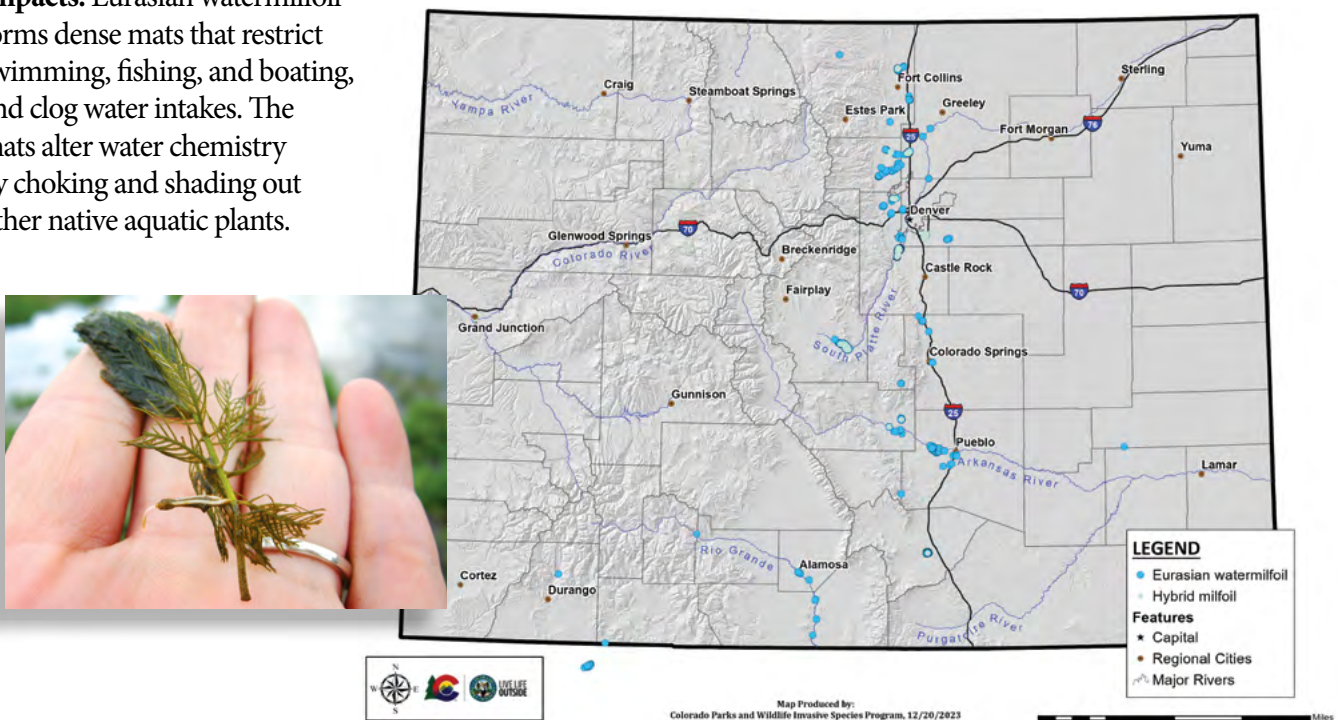


The decaying plants decrease oxygen levels in the water and foul lakeside beaches. This disrupts the food chain and destroys habitat and food needed by fish and birds. Eurasian watermilfoil slows the flow of water in irrigation ditches and canals and creates standing water that is ideal mosquito habitat.

Current Status in Colorado (See Map):

EWM was first documented in the Rio Grande River in the late 1990's, in the City of Westminster in 1999, and Boulder Creek in 2004. Since that time, EWM has spread throughout much of the South Platte, Arkansas, and Rio Grande River Basins. EWM is also known to many reservoirs, including Navajo, Pueblo, and more. EWM is detected in new locations almost every year.

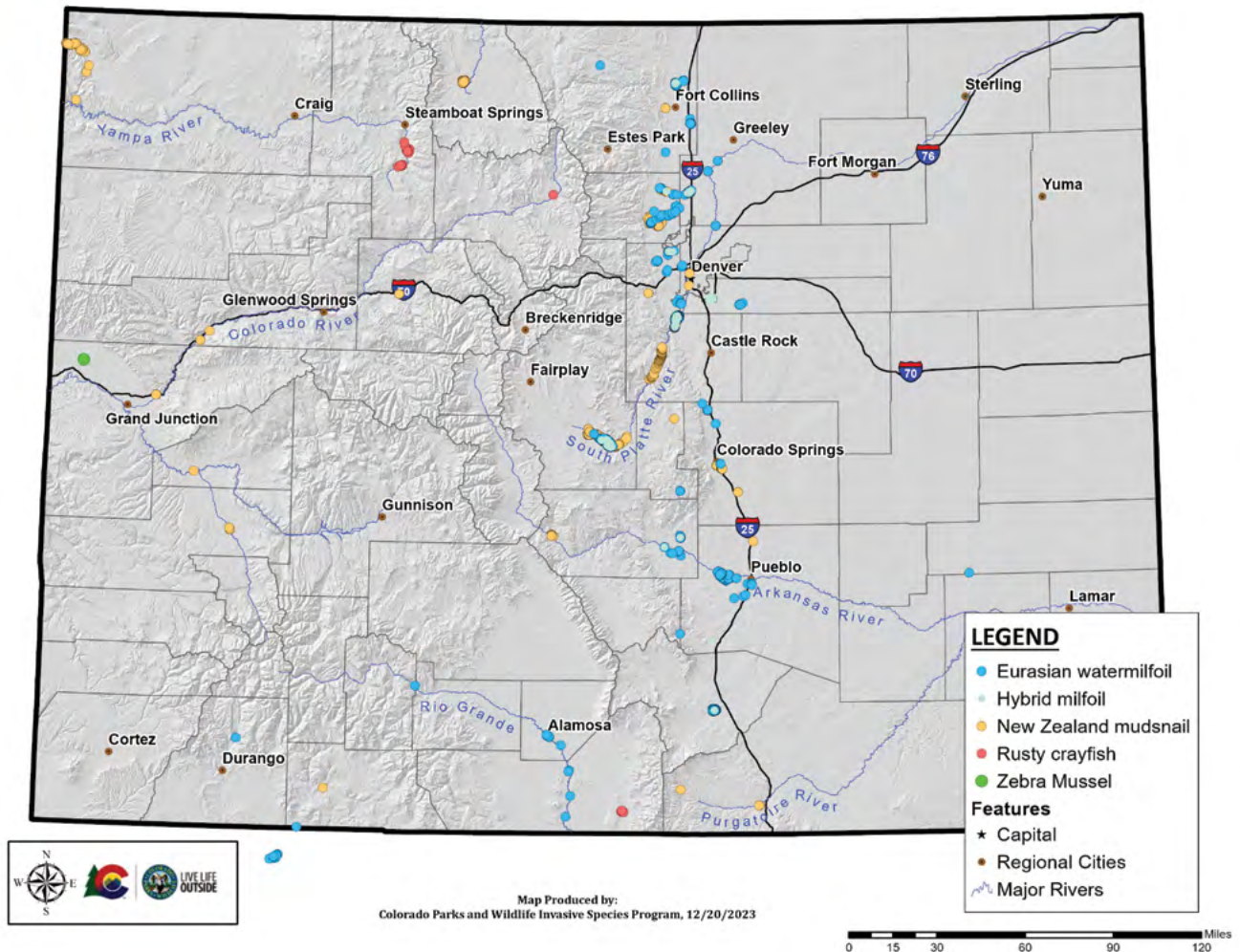
Eurasian Watermilfoil Distribution for 2024



List of WID Stations with Known ANS

WID Location (alphabetical order)	ANS Present
Arvada Reservoir	Eurasian Watermilfoil
Aurora Reservoir	Eurasian Watermilfoil
Boulder Reservoir	Eurasian Watermilfoil
Chatfield Reservoir	NZMS, Eurasian Watermilfoil
Cherry Creek Reservoir	Hybrid Eurasian Watermilfoil
Elevenmile Reservoir	NZMS, Eurasian Watermilfoil
Highline Lake	Zebra Mussels
Lake Granby	Rusty Crayfish
Lathrop State Park (Horseshoe & Martin Reservoirs)	Eurasian Watermilfoil
Navajo Reservoir	Eurasian Watermilfoil
Pueblo Reservoir	Eurasian Watermilfoil
Spinney Mountain Reservoir	NZMS, Eurasian Watermilfoil
Stagecoach Reservoir	Rusty Crayfish
Standley Lake	Eurasian Watermilfoil
Tommy's Slalom Shop Test Lake	Eurasian Watermilfoil
Trinidad Lake	NZMS

All ANS Distribution for 2024



Chapter 3 Review Questions

1. The Asian Clam (*Corbicula*) is a lookalike invasive species that is fairly common in Colorado. What are two characteristics that make it different than ZQM?
 - 1.) _____
 - 2.) _____
2. Which group lists other ANS of concern for transportation overland on recreational watercraft?
 - a. Northern Pike, Rainbow Trout, Pondweed, Brown Trout
 - b. Eurasian watermilfoil, Rusty Crayfish, New Zealand Mudsnails
 - c. Boreal Toad, Round Goby, Rusty Crayfish, Arkansas River Darter
 - d. Northern watermilfoil, Bullfrog, Boreal Toad, Purple Loosestrife
3. Where is the transportation of live crayfish prohibited?

4. List ways that people commonly spread New Zealand mudsnails.

5. Which location is positive for New Zealand Mudsnails?
 - a. Vallecito Reservoir
 - b. Navajo Reservoir
 - c. Trinidad Lake
 - d. Jackson Lake
6. Rusty Crayfish make good prey for fish. (circle one) True or False
7. In what waterbody were rusty crayfish most recently detected?
 - a. Blue Mesa Reservoir
 - b. Lake Granby
 - c. Jumbo Reservoir
 - d. Carter Lake
8. Eurasian watermilfoil _____ can spread on boats and infest new waters—which is why it's important that boats leaving EWM positive waters get inspected and don't transport plant parts.

Chapter 4 Watercraft 101



Chapter 4: Watercraft 101

Boat Terminology

The following definitions are the most common terms you will need to know as an inspector.

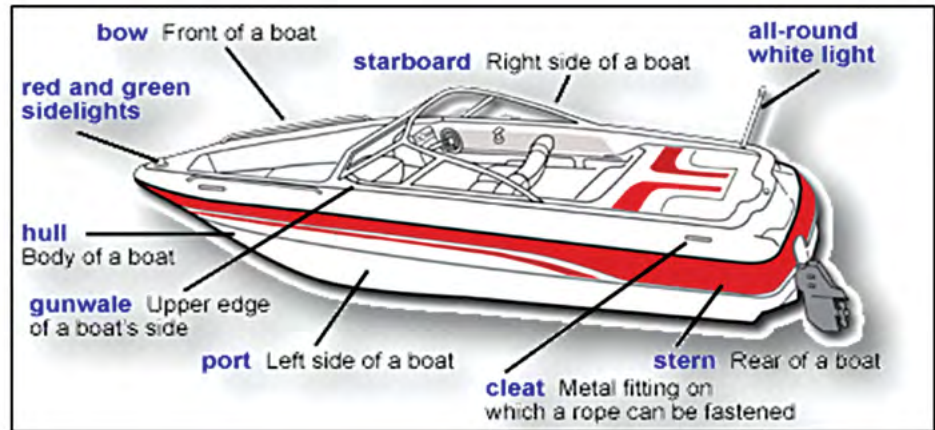
aft—A nautical term that refers to the rear or stern of the boat.

anchor storage—An interior compartment area on the boat, typically in the bow of the boat, where the anchor is stored.

bait well—An interior compartment that specifically holds live aquatic bait. Sometimes it is a separate container on the boat or incorporated in the live well compartment. May also be a pull out bucket.

ballast tank—A compartment within a boat, ship or other floating structure that holds water. Adding water (ballast) to a vessel lowers its center of gravity and increases the draft of the vessel. A ballast tank can be filled or emptied in order to adjust the amount of ballast force. Small sailboats designed to be lightweight for being pulled behind automobiles on trailers are often designed with ballast tanks that can be emptied when the boat is removed from the lake or reservoir.

bilge—The lowest compartment on a boat where the two sides meet at the keel. The word is sometimes also used to describe the water that collects in this compartment. Water that does not drain off the side of the deck drains down through the boat into the bilge.



bilge plug—A plug located either on the transom wall or in the bottom of the hull that keeps lake water from entering the boat. It must be removed when exiting the water body.

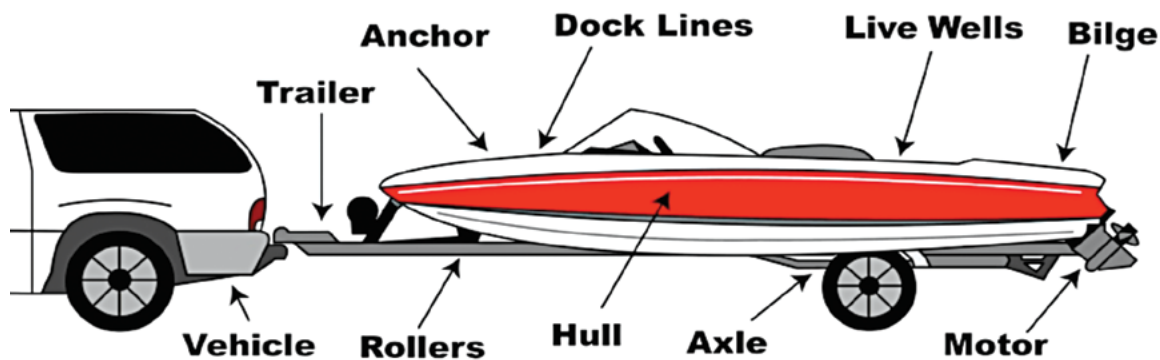
bilge pump—A water pump used to remove excessive bilge water. The water that collects in the bilge must be pumped out to prevent the bilge from becoming too full and threatening to sink the boat on the lake or reservoir.

bow—A nautical term that refers to the forward part of the hull of a boat.

cavitation plate—A flat metal fitting mounted horizontally above the propeller of an outboard motor, which helps direct the flow of water into the propeller and reduces cavitation. Cavitation is the effect caused when air is drawn down into the water by a propeller, resulting in loss of power, overspending of the engine and propeller, and pitting of the metal surfaces of the propeller.

centerboard—A retractable keel which pivots out of a slot in the hull of a sailboat, known as a centerboard trunk. A centerboard is used to provide lift to counter the lateral force from the sails.

complex boat—A boat that has one or more interior compartments or a closed hull or more than one motor.



daggerboard—A retractable keel used by various sailing craft. While other types of centerboard may pivot to retract, a daggerboard slides in a casing. The shape of the daggerboard converts the forward motion into a windward lift, countering the leeward push of the sail.

fish box—An interior compartment in a boat where fish are kept.

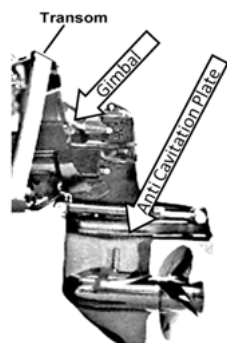
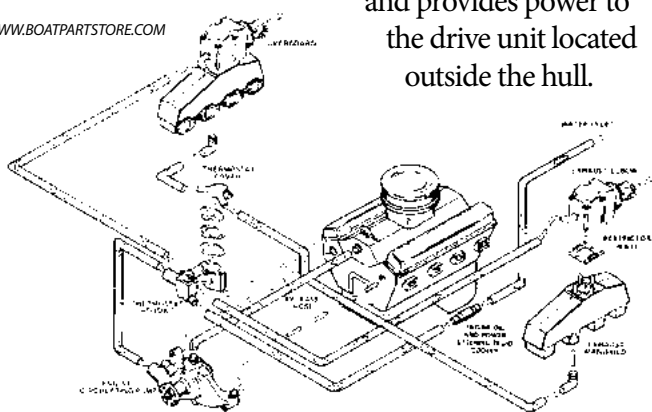
gimbal—A pivoted support that allows the rotation (up and down and side to side movement) of the outdrive of an I/O engine and outboard motor.

hull—The body or frame of a boat.

inboard engine—A marine propulsion system enclosed within the hull of the boat.

inboard/outboard engine—(I/O) is located inboard just forward of the transom (stern) and provides power to the drive unit located outside the hull.

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This drive unit (or lower unit or outdrive) resembles the bottom half of an outboard motor.

© WEN BALDWIN

jet boat—A boat propelled by a jet of water ejected from the back of the craft. A jet boat draws the water from under the boat into a pump inside the boat, and then expels it through a nozzle at the stern.

keel—Runs in the middle of the boat, from the bow to the stern, and serves as the foundation or spine of the structure, providing the major source of structural strength of the hull. Keels are different from centerboards and other types of foils in that keels are made of heavy materials to provide ballast to stabilize the boat. Keels may be fixed, or non-movable or they may retract to allow sailing in shallow waters.

live well—An interior compartment found on many fishing boats that is used to keep caught fish alive. It works by pumping fresh water from the water body into the tank, as well as keeping the water aerated.

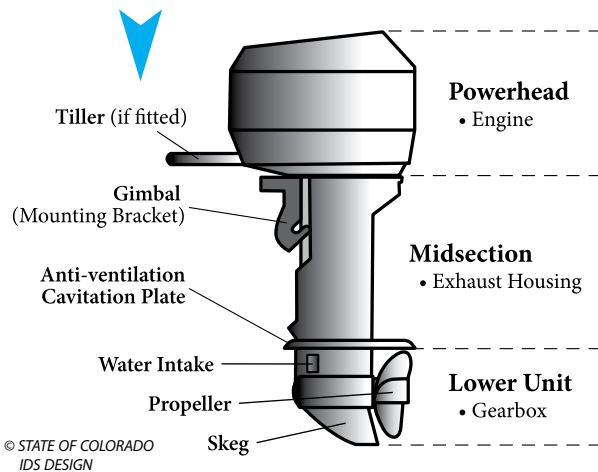
live well pump—A pump that assists in filling a live well with lake water.

lower unit—The bottom portion of an outboard motor or an inboard/outboard engine. The water found in this portion is lake water that has not been heated by the motor/engine.

macerator pumps—Pumps designed to empty holding tanks when fitted onto the plumbing in boats. The function of the pump is to suction the solids and liquids from the lines connected to the holding tanks and grind the effluent with the rotating cutter head down to a small particle size and discharge the waste.

outboard motor—A propulsion system for boats, consisting of a self-contained unit that includes engine, gearbox, and propeller. It is designed to be affixed to the outside of the

transom and is the most common motorized method of propelling small watercraft. As well as providing propulsion, outboards provide steering control, as they are designed to pivot over the gimbal (mounting bracket) and control the direction of the thrust. The skeg also acts as a rudder when the engine is not running.



pitot tube—A pressure measurement instrument used to measure the velocity of a boat at a given point and is usually attached to the transom.

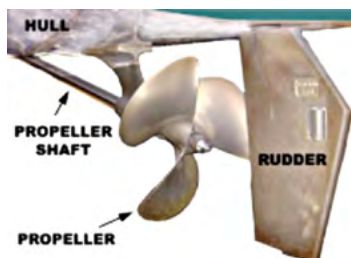
port—A nautical term that refers to the left side of the boat as perceived by a person who is in the boat facing the bow.

PWC—Personal Water Craft: A recreational watercraft that the user sits or stands on, rather than inside of, as in a boat. Models have an inboard engine driving a jet pump that has a screw-shaped impeller to create thrust for propulsion and steering.



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rudder—A device used to steer a boat when moving through water. A rudder operates by redirecting water that has passed the hull, imparting a turning motion to the craft.



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sailboat—A boat propelled partially or wholly by sail.

sea strainer—A filtration device used to prevent solids from reaching internal compartments, such as pumps on engines or ballast tanks.



simple boat—A boat with an open hull, no containers or compartments and a single outboard motor.



skeg—A support at the bottom of a rudder.

starboard—A nautical term that refers to the right side of the boat as perceived by a person who is in the boat facing the bow.

stern—The rear or aft-most part of a boat.

transducer—An instrument that projects a sound wave into the water. When the wave strikes something such as a fish, it is reflected back and displays size, composition, and shape of the object on a screen inside the boat.

transom—The surface that forms the flat back panel of the stern of a boat.

transom well—A recessed area where water collects that is formed by the transom. Good examples of this include the stern of a pontoon boat or the area where an outboard motor is attached.

trim tabs—The small surfaces (shelves) that are connected to the transom on a boat mostly found on cruisers, sport fishing boats, and center console boats ranging from 20 feet and up.

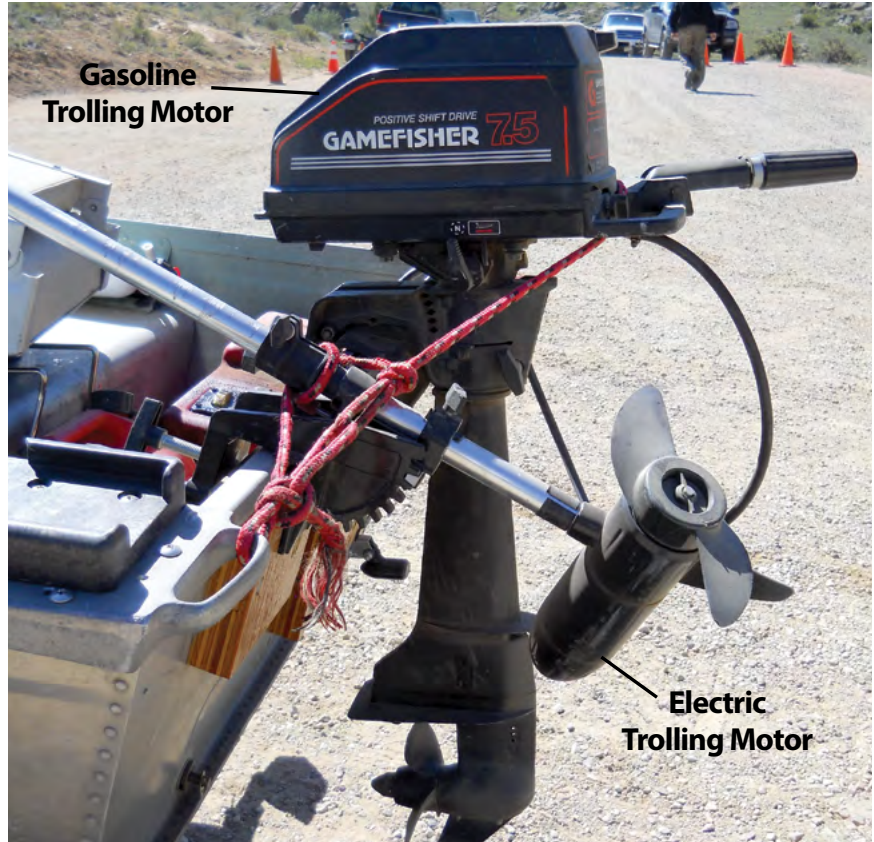
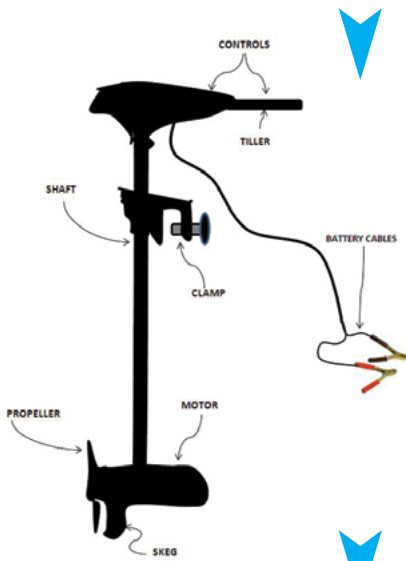


Marine Propulsion Systems

The purpose of this section is to inform the boat inspector about the propulsion systems that are used to power watercraft. There are electric and gas trolling motors, outboard motors, inboard/outboard engines (I/O), inboard engines, and jet drives in jet boats and PWCs.

Trolling Motors

An **electric trolling motor** is a marine propulsion system consisting of a self-contained unit that includes an electric motor, propeller and controls, and is affixed to a boat, either at the bow or stern.



© WIKIPEDIA

A **gasoline-powered outboard**, if it is not the vessel's primary source of propulsion, may also be referred to as a **gasoline trolling motor**. Small outboard motors are frequently used as trolling motors on boats with much larger engines that do not operate as efficiently or quietly at trolling speeds. These typically are designed with a manual pull start system, throttle, and gearshift controls mounted on the body of the motor, and a tiller for steering. Trolling motors are often lifted from the water to reduce drag when the boat's primary engine is in operation.

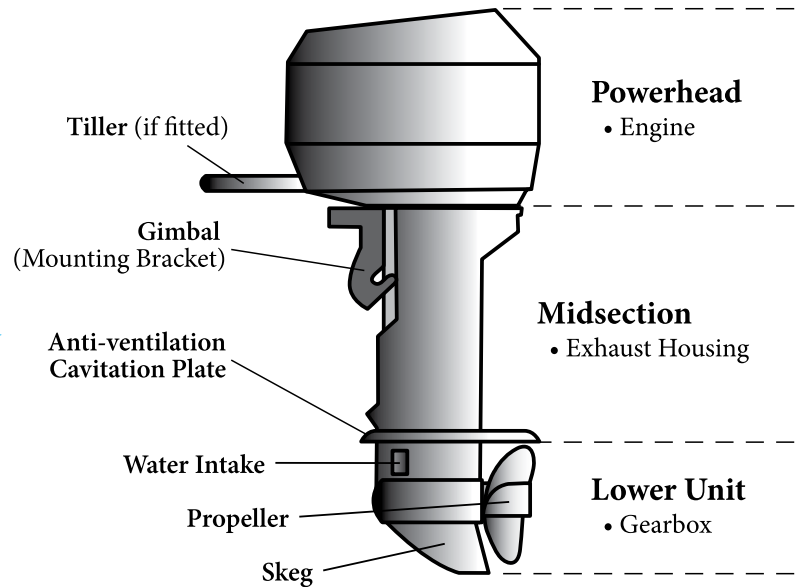


As shown in the first photo, the intakes on some of the gas trolling motors are underneath the cavitation plate. Others are so close to the edge that most mufflers do not cover them in order to perform a decontamination, as shown in the second photo.



Outboard Motors

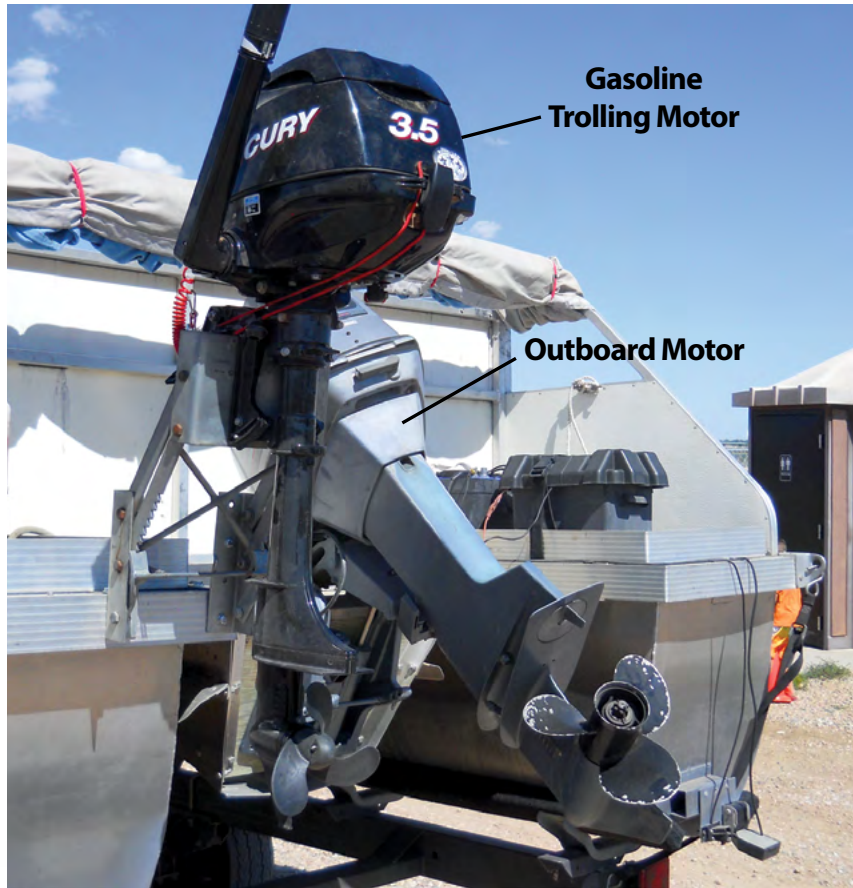
An **outboard motor** is a marine propulsion system, consisting of a self-contained unit that includes engine, gearbox, and propeller, designed to be affixed to the outside of the transom. This is the most common motorized method of propelling small watercraft. As well as providing propulsion, outboards provide steering control, as they are designed to pivot over the gimbal (mounting bracket) and control the direction of the thrust. The skeg also acts as a rudder when the engine is not running.



The intakes on this Evinrude outboard motor are only on one side and are shown as the small rectangle.

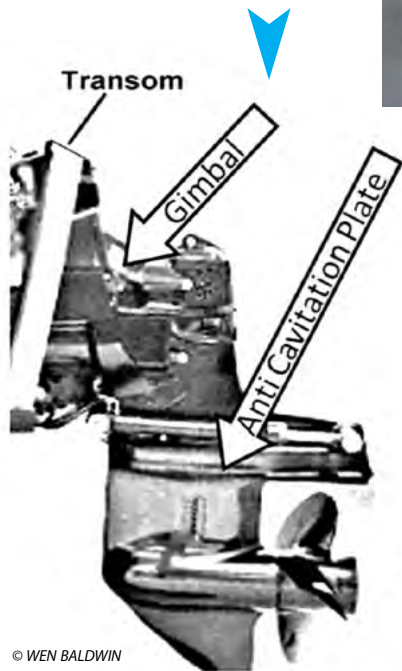


This photo shows an outboard motor on a pontoon boat with a back up gas trolling motor.



Inboard/Outboard Engines

An **inboard/outboard (I/O) engine** is located inboard just forward of the transom (stern) and provides power to the drive unit located outside the hull. This drive unit (or lower unit or outdrive) resembles the bottom half of an outboard motor.



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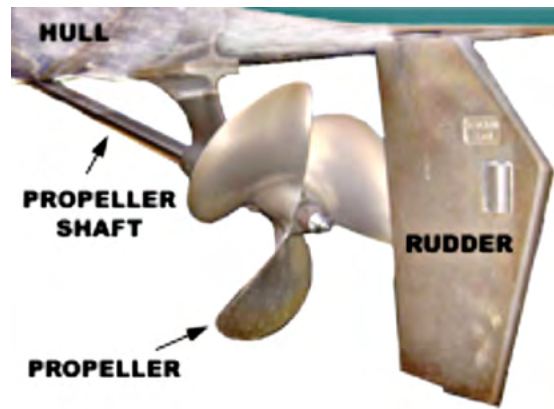


After an I/O has exited the lake or reservoir there is water in the hose from the water inlet to the engine circulating pump. When the engine is started in another water body, this water goes through the “cold” engine and is expelled into the water. If this water is from a positive reservoir the chance of live veligers being present in the water is very high.

Inboard Engines

An **inboard engine** is a marine propulsion system enclosed within the hull of the boat. Inboard engines have a raw water cooling system where water from the reservoir is pumped by the engine to cool it.

Attached to the hull of the boat is the propeller shaft and propeller which propels the boat through the water. The rudder acts as the “steering wheel” to guide the boat.



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After opening the inboard engine compartment, the bilge area around the engine can be inspected and/or decontaminated for standing water.



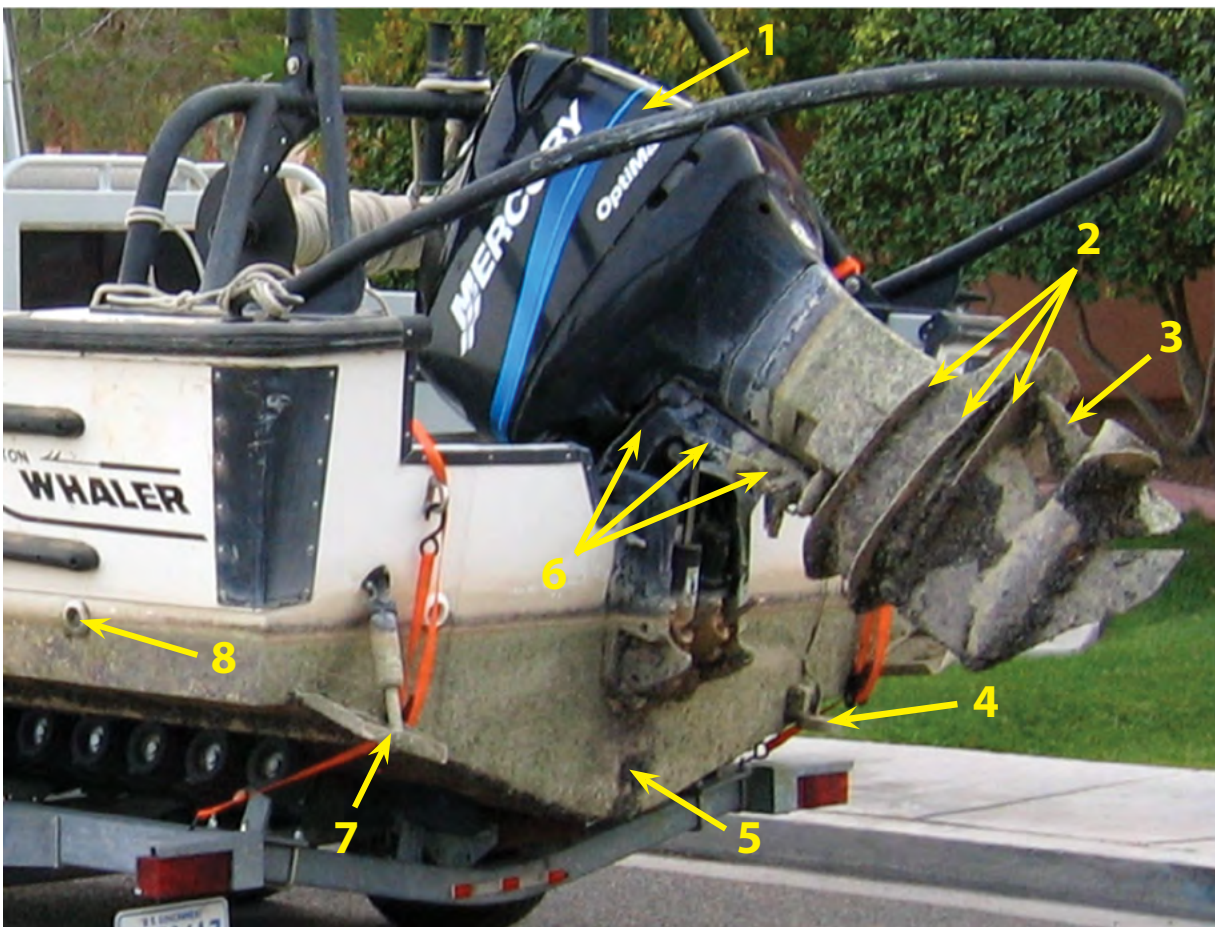
Jet Boat

A **jet boat** is a boat propelled by a jet of water ejected from the back of the craft. Unlike a powerboat or motorboat that uses a propeller in the water below or behind the boat, a jet boat draws the water from under the boat into a pump inside the boat. The water then passes through a series of impellers and stators—known as stages—which increase the velocity of the water flow. The water is then expelled through a nozzle at the stern. Most modern jets are single stage while older waterjets may have as many as three stages. The tail section of the waterjet unit extends out through the transom of the hull above the waterline.



This jet stream exits through a small nozzle at high velocity to push the boat forward.

Fill in the blanks with the correct boat terminology



- 1. (engine type) _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____



- 1. _____ 5. _____
 2. _____ 6. _____
 3. _____ 7. _____
 4. _____ 8. (engine type) _____



- 1. _____
 2. (engine type) _____
 3. _____
 4. _____
 5. _____
 6. _____
 7. _____
 8. _____



- 1. (engine type) _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____

Watercraft Risk Assessment

There are three main categories of boats:

Regulation Exempt Boats

- Does not need to be inspected unless they launch from a trailer or have an engine or motor.



Simple Boats

- Must be inspected.
- A boat with an open hull **and** no containers **and** compartments **and** a single outboard motor.



Complex Boats

- Must be inspected.
- A boat that has one or more interior compartments **or** a closed hull **or** more than one motor or engine.



Which Watercraft are Exempt from Mandatory Inspections?

Regardless of exemption, try to educate all boaters and recreationists about ANS. All watercraft are required to be clean, drained, and dry in between uses.

All Hand-Launched AND Human-Powered watercraft are exempt.

Marine propulsion systems must be inspected regardless of the type of motor, engine, or watercraft. They are not exempt.

Any trailer that goes into the water must be inspected. Trailers are only exempt when they do not enter the water **and** the watercraft on the trailer is hand-launched and human-powered.

What are the reasons for exempting hand-launched and human-powered watercraft from inspection?

1. Hand-launched and human-powered.
2. Does not have a marine propulsion system.
3. Typically do not have interior water holding compartments.
4. Typically do not stay on the water long = short exposure time.
5. Typically do not stay still on the water = short exposure time.
6. Typically do not anchor or make contact with lake or reservoir bottom.
7. Typically fully dried out before putting in a car or on top of a car for transport.
8. Provides a low-risk access option for boaters and anglers when inspections aren't present and boat ramps are closed.

Which Watercraft Must be Inspected?

If the watercraft is not hand-launched and human powered, it must be inspected. All motors and engines must be inspected. Any trailer that enters the water must be inspected.

When an exempt vessel loses its exempt status it must undergo a high risk inspection. This includes asking about live aquatic bait, and following a standard H.E.A.D. inspection, checking all compartments, as well as visually and physically inspecting the craft and entering the inspection into the database.

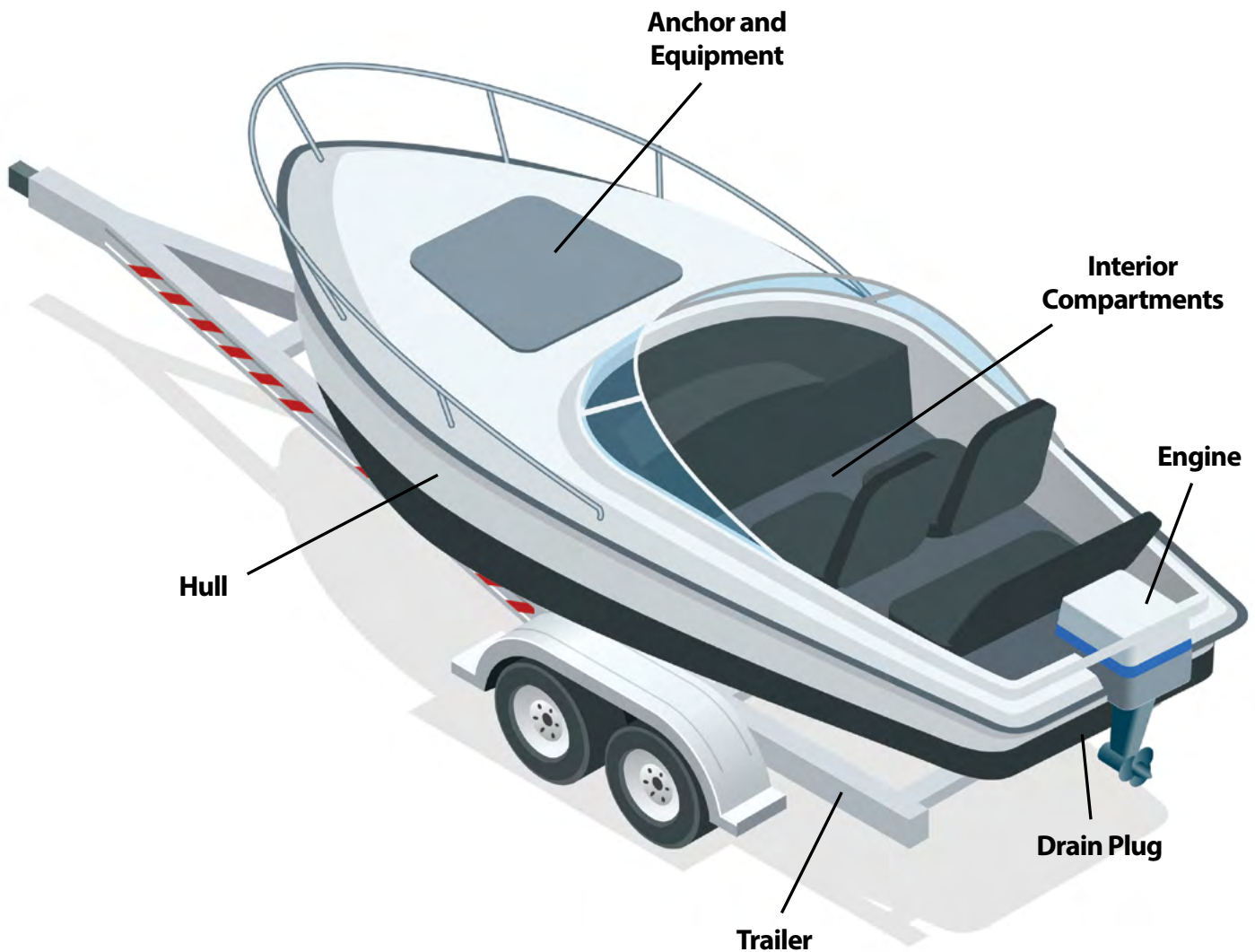
Where Do We Look?

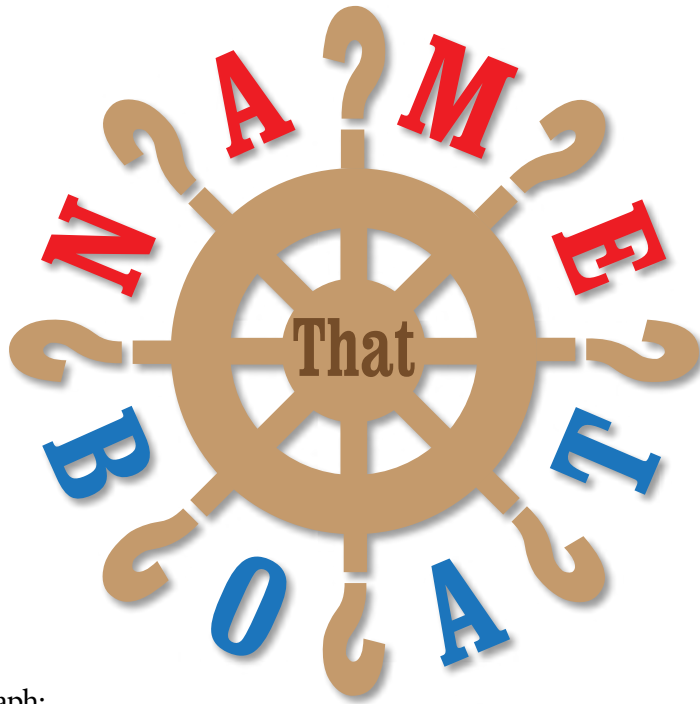
H.E.A.D. is an acronym that can help you remember where to look for mussels on boats during entrance and exit inspections.

- H = Hull and Trailer
- E = Engine or Motor (including Transom)
- A = Anchor, Anchor Rope, and Equipment
- D = Drain Interior Compartments

Watercraft Type	Risk Level
<i>House Boats, Cabin Cruisers, Ski Boats, Wakeboard Boats, Jet Boats, and Sailboats with Ballast Tanks</i>	Very High Biological Risk
<i>Large Open Boats, Ski Boats, Wakeboard Boats, Jet Boats, Sailboats with No Ballast Tanks, and Personal Watercraft (PWC)</i>	High Biological Risk
<i>Electric Kayaks, Electric Foils, Electric Canoes etc., Kayak/Canoe/etc. on a Trailer, and Simple Boats—Open Hull, Single Motors, No Interior Containers or Compartments</i>	Medium Biological Risk
<i>Exempt Watercraft: Hand-Launched and Human-Powered</i>	Low Biological Risk

Outdoor Session—Boat Anatomy





Name That Boat Game

Near each photograph:

- A. Circle if the watercraft is exempt, simple, or complex.
- B. Circle the type of marine propulsion system.
- C. Label the Boat Type using the key to the right.

Boat Type
Administration/Agency Boat
Exempt Boat
Cabin Cruiser
Fishing Boat
House Boat
Hunter
Jon Boat
Other
Personal Watercraft
Pontoon
Sail Boat
Simple Boat
Ski Boat
Wakeboard Boat



- 1A. Exempt Simple Complex
- 1B. Outboard I/O Inboard Jet
- 1C. Boat Type: _____



- 2A. Exempt Simple Complex
- 2B. Outboard I/O Inboard Jet
- 2C. Boat Type: _____



- 3A. Exempt Simple Complex
- 3B. Outboard I/O Inboard Jet
- 3C. Boat Type: _____



- 4A. Exempt Simple Complex
- 4B. Outboard I/O Inboard Jet
- 4C. Boat Type: _____



- 5A. Exempt Simple Complex
- 5B. Outboard I/O Inboard Jet
- 5C. Boat Type: _____



- 6A. Exempt Simple Complex
- 6B. Outboard I/O Inboard Jet
- 6C. Boat Type: _____



- 7A. Exempt Simple Complex
- 7B. Outboard I/O Inboard Jet
- 7C. Boat Type: _____



- 8A. Exempt Simple Complex
- 8B. Outboard I/O Inboard Jet
- 8C. Boat Type: _____



- 9A. Exempt Simple Complex
- 9B. Outboard I/O Inboard Jet
- 9C. Boat Type: _____



- 10A. Exempt Simple Complex
- 10B. Outboard I/O Inboard Jet
- 10C. Boat Type: _____



- 11A. Exempt Simple Complex
- 11B. Outboard I/O Inboard Jet
- 11C. Boat Type: _____



- 12A. Exempt Simple Complex
- 12B. Outboard I/O Inboard Jet
- 12C. Boat Type: _____



- 13A. Exempt Simple Complex
- 13B. Outboard I/O Inboard Jet
- 13C. Boat Type: _____

Chapter 4 Review Questions

1. What are the two criteria a watercraft must meet to be exempt from mandatory inspections?

1.) _____

2.) _____

2. List three reasons why they are exempt from inspections.

1.) _____

2.) _____

3.) _____

3. Why are ballast tanks a big deal for inspection and decontamination?

4. Circle the one item you need to inspect on a sailboat that is different from other boats.

a. Hull and Trailer

b. Centerboard Box

c. Rudder

d. Motor

5. Match the watercraft type with the appropriate risk level.

Risk Level

a. Low Biological Risk

b. Medium Biological Risk

c. High Biological Risk

d. Very High Biological Risk

Watercraft Type

_____ House Boats, Cabin Cruisers, Ski Boats, Wakeboard Boats, Jet Boats, and Sailboats with Ballast Tanks.

_____ Large Open Boats, Ski Boats, Wakeboard Boats, Jet Boats, Sailboats with No Ballast Tanks, and Personal Watercraft (PWC).

_____ Electric Kayaks, Electric Foils, Electric Canoes etc., Kayak/Canoe/etc. on a Trailer, and Simple Boats—Open Hull, Single Motors, No Interior Containers or Compartments.

_____ Hand-Launched and Human-Powered Watercraft.

6. Match the definition to the engine or motor:

Engine or Motor

Definition

- a. Inboard/Outboard Engine
- b. Outboard
- c. Trolling Motor
- d. Inboard Engine
- e. Jet Engine

- _____ A marine propulsion system consisting of a self-contained unit that includes a motor, propeller and controls, and is affixed to an angler's boat, either at the bow or stern. Typically electric but also gas powered.
- _____ Enclosed within the hull of the boat. These have a raw water cooling system where water from the reservoir is pumped by the engine to cool it. Attached to the hull of the boat is the propeller shaft and propeller which propels the boat through the water. The rudder acts as the "steering wheel" to guide the boat.
- _____ Located just forward of the transom (stern) and provides power to the drive unit located outside the hull. This drive unit (or lower unit or outdrive) resembles the bottom half of an outboard motor.
- _____ This propulsion system draws the water from under the boat into a pump inside the boat. The water then passes through a series of impellers and stators—known as stages—which increase the velocity of the water flow. The water is then expelled through a nozzle at the stern. The tail section of the unit extends out through the transom of the hull above the waterline. This water stream exits through a small nozzle at high velocity to push the boat forward.
- _____ A marine propulsion system for boats, consisting of a self-contained unit that includes engine, gearbox, and propeller, designed to be affixed to the outside of the transom and is the most common motorized method of propelling small watercraft. As well as providing propulsion, these provide steering control, as they are designed to pivot over the gimbal (mounting bracket) and control the direction of the thrust. The skeg also acts as a rudder when the engine is not running.

7. Which compartments cannot be fully drained on a watercraft? (circle all that apply).

- a. Ballast Tank or Bag
- b. Inboard Engine
- c. Inboard/Outboard Engine
- d. Outboard Engine
- e. Bait Well
- f. All of the above

8. What boats require inspection? (circle all that apply).

- a. Hand-launched and human-powered canoe or kayak.
- b. Boats with an electric, gas, or diesel motor.
- c. Boats that launch from a trailer.
- d. Jet Skis or other Personal Watercraft

Chapter 5 Watercraft Inspection Procedures



Chapter 5: Watercraft Inspection Procedures

The Ideal Inspector

What characteristics, traits, or qualities make up the Ideal Inspector?

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____



Inspector Roles, Expectations, and Guidance

The Role of the Authorized Agent (Inspector)

1. Inspect Watercraft for ANS.
2. Decontaminate Watercraft for ANS.
3. Educate and Inform the Public about ANS.

The inspector's role is to teach boat operators to inspect their own watercraft each time they launch and to ensure it is clean, drained, and dry in between every use.

Expectations

- Wear Uniforms and Appropriate Clothing/PPE.
- Show up on time or early for your shift.
- Send rumors related to ANS to your supervisor or ANS Program Office.
- Stick to the talking points—learn the Boater's Brochure!
- Smile!

Unless otherwise instructed by their supervisors to do so, Inspectors should NOT do the following:

- Law Enforcement
- Campground Management
- Search and Rescue
- Fishing License checks
- Post Signage
- Manipulate the land in any way
- Boater Safety Checks
- Boat Registration Checks
- Bathroom cleaning
- Fee collections

What is NOT allowed in the workplace?

- Pets
- Sleeping on the Job
- Leaving the Ramp Unattended
- Marijuana, Drugs, or Alcohol of any kind
- Violence
- Smoking while Boaters/Visitors are Present
- Concealed weapons (even with permit)



Inspector Guidance

Equipment is for use at the inspection station, by employees for inspection and decontamination only.

- Report broken or missing equipment to your crew leader or supervisor.
- Do not remove equipment from the site.
- Do not use state equipment for any purpose other than what it was intended by your employer.
- Do **not** charge for inspection or decon.
- Do **not** accept \$ tips.
- Do not attempt to sell CPW or Authorized Location equipment.
- Return all equipment at the end of the season.

What Are The Mandatory Inspection Laws and Regulations in Colorado?

Resident Boaters must pass a state-certified watercraft inspection if:

- The watercraft has launched out of state.
- The watercraft has launched on any of the Colorado lakes or reservoirs where ANS have been detected. The boat operator must submit the watercraft to an inspection prior to leaving.
- The watercraft is being launched in a lake or reservoir where inspections are required prior to entry. Boaters should expect their watercraft to be inspected at any lake or reservoir in the state.

Out-of-State boats must pass a state-certified inspection and/or decontamination before launching the watercraft in any Colorado lake, reservoir, or waterway.

The Goal for Every Boat:

Clean, Drain, Dry in between each and every use!

**No Water. No Animals/Mussels.
No Plants. No Mud.**

Types of WID Stations

Negative Prevention Waters—Waters that have never had a verified detection of any ANS or have not had a detection within the time frame for de-listing.

Other ANS Containment Water—Waters that are positive for an Other ANS. They have a verified presence of an ANS listed in Parks Chapter 8 regulations other than zebra or quagga mussels. Most ANS Positive waters are also prevention waters for mussels and other ANS.

ZQM Containment Water—Waters that have had a verified zebra or quagga mussel detection.

Off Water WIDS—Authorized locations that are not located at a water body (e.g. offices or business locations).

What Are the Priorities As a Watercraft Inspector?

1. **Ensure Personal and Public Safety**—The safety of the authorized agent and the safety of the public is top priority at all times. Many vehicles and boats will be moving around the inspection area. People will be looking under trailers and through the watercraft. You will need to ensure the safety of all involved.
2. **Educate Boaters**—Every contact made with boaters is an educational opportunity to teach them about the importance of controlling zebra and quagga mussels and other ANS. Boaters must realize that ANS are spread by their actions (or inaction). They must understand that they can lose access and their recreational opportunities if they do not help in this effort. The primary education message is **Clean, Drain, and Dry**:
 - Clean:** Remove all plants, animals, and mud. Thoroughly wash everything.
 - Drain:** Drain every space or item that can hold water. Remove all water drain plugs.
 - Dry:** Make sure the watercraft is completely dry which means sponging, toweling or pumping all water out.
3. **Inspecting Watercraft—Assessing the Risk of the Watercraft**—By following the inspection procedure detailed later in this chapter, inspectors are ensuring that the biological risk of the watercraft is reduced prior to launching and that watercraft are leaving clean, drained, and dry before exiting.
4. **Draining Standing Water**—Colorado's WID procedures are largely based on mitigating the risks associated with transporting organisms from one water body to another in standing water. These organisms (e.g. mussel veligers, pathogens or plant fragments) are typically microscopic so it is essential that standing water be drained in between each and every use.
5. **Decontamination**—If there is a known or suspect ANS on a watercraft, or standing water that can not be drained, the watercraft must be decontaminated. See Chapter 6.

What Are The Types of Inspections?

These procedures have been proven effective in identification and interception of watercraft that have zebra or quagga mussels, New Zealand mudsnails, rusty crayfish, and noxious weeds. Following these protocols and educating the boater **WILL** prevent the spread of ANS.

There are four inspection protocols that will be described in detail later in the Chapter.

1. **Entrance Inspection:** This inspection procedure applies to all trailered, motorized watercraft before entering prevention or containment water bodies.
2. **Exit Inspection—Negative and Other ANS Containment:** This procedure is for boats leaving a negative or other ANS positive reservoir. This inspection ensures that contact has been made with the boater before they leave the boat ramp and verifies that the watercraft is clean and drained prior to exiting. Make sure the boater pulls all plugs, removes plants, checks sea strainers, drains all water, and wells are empty.
3. **Exit Inspection—ZQM Containment:** This procedure is for boats leaving lakes or reservoirs that are listed as suspect, positive, or infested for zebra or quagga mussels. Upon exiting, the inspector performs a full inspection and decontaminates those that can't be drained and are going to a different water body next.



4. **Off Water Inspection:** These inspections are mostly performed at offices and businesses that are not located at a water body. They could, however, be performed at a water body for someone needing a seal but not intending to launch at that location next. This is a hybrid entrance-exit inspection, which follows the entrance inspection procedure and ends with a seal application.

What Equipment Do I Need?

Every inspector should have the following items when performing inspections:

- Uniform and Safety Vest
- Tablet for Data Collection
- Educational Materials
- L.E.D. Flashlight
- Mirror
- Magnifier
- Seals
- Wire
- Wire Cutter
- Receipts
- Digital Camera
- Sample Collection Kit

Supervisors will need to be sure the equipment and materials on the following page are available.





Safety Equipment

- Traffic cones
- Orange traffic safety vests
- Chocks for the trailer (*optional*)
- Rolling stepladder for boat access (*optional*)
- First Aid Kit
(*For use by first aid trained staff only. If not first aid trained, use only on self—not for use on anyone else or members of the public.*)
- Personal Protective Equipment (PPE)— refers to protective clothing such as closed toe shoes, gloves, hats, sun protection, sunscreen, eye protection, insect protection, bugscreen, water proof suit, etc.

Inspection Equipment

- WID Activity Log Form or Data Collector
- Green seals, wire, and seal receipts
- Wire cutters
- Crescent wrench to take out bilge plugs
(*9/16" socket also handy to give boater if they need it. Inspectors—don't use tools on other's boats.*)
- Digital camera
- Hand wipes
- Hand sanitizer
- Paper towels
- Inspection mirrors
- Flashlights
- Magnifying glass
- Sample collection kit
- Work lights
- Method of communication
(*Radio, cell phone, etc.*)
- Weather radio
- Clipboards
- Pens/pencils
- Vise grips
- Buckets
- Nets
- Bilge pump

Staff Equipment

- Uniforms
(*shirts, vests, name tags, hats, etc.*)
- Chairs
- Access to drinking water
- Access to restrooms
- Access to shelter in case of weather
- Sun block
- Trash can

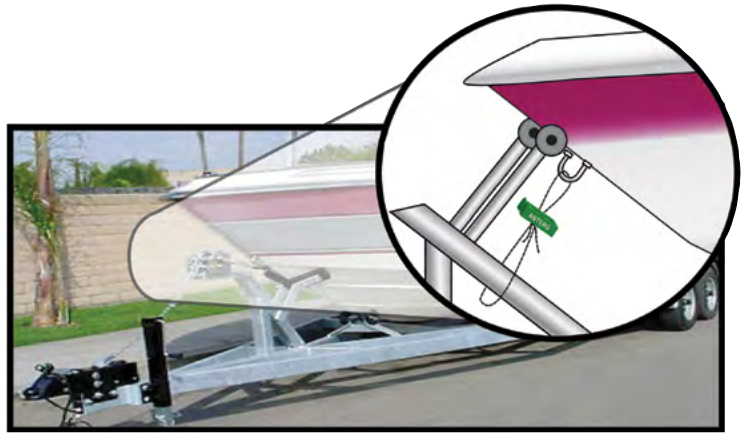
Educational Materials

- Mussel education brochures
- Boating regulation brochures
- Fishing regulation brochures
- Maps of reservoir/lake/etc.

Seals and Receipts

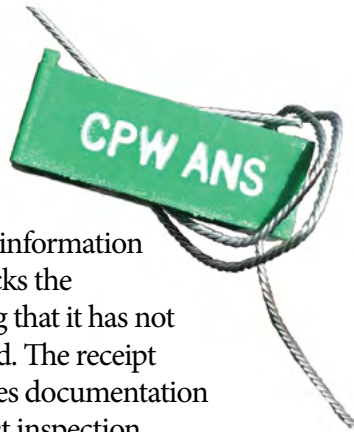
Overview of the ANS Wire Seals and Receipts

A critical step in the entrance inspection procedure is to check for a seal and verify the receipt. The last step in the exit inspection procedure is to apply a seal and receipt. Therefore, it is very important that inspectors understand the seal system before learning the full inspection procedures.



What is the green seal system?

Colorado uses a wire seal, coupled with a receipt, to communicate the location of the boat's last inspection or decontamination and associated information to the next inspector. The seal locks the watercraft to the trailer indicating that it has not launched since the seal was issued. The receipt accompanies the seal and provides documentation regarding date and location of last inspection, protocol used, type of decontamination, if any, and other important information.



It is imperative that you understand exactly how these seals are used and what they tell you about the risk level of that watercraft.

When Do Boats Get a Green Seal and Receipt?

- A. If a watercraft leaves a water body and passes an exit inspection or decontamination.
- B. If a watercraft comes to an office or business WIDS and passes an off-water inspection or decontamination.

Where Are Green Seals Applied?

The seal must be attached in a way that ensures it will be broken if the watercraft is separated from the trailer. Typically, the wire seal goes between the eyebolt and a hard welded part of the trailer. Be advised that some winches can be unrolled completely and separated from the seal without breaking.

Note: The inspector must physically and visually inspect the seal itself to make sure it has not been tampered with.

Exit Inspection with Seal Application Goals for WID Sites = 100%

All WID Stations should strive to provide seals and receipts to all boaters exiting their sites.

Seal Receipts

Seals are only valid with a matching receipt. The seal tells you that the watercraft has not launched since its last inspection. The receipt tells the next inspector what kind of inspection or decontamination was performed at the last site, in addition to when it was performed and by whom. This information will help to determine the risk this watercraft poses and what type of inspection or decontamination needs to be performed before allowing the boater to launch.

When applied properly, seals with receipts should decrease the amount of time for the boater and the inspector. In most cases, the watercraft will not need to be inspected or decontaminated upon entry if they have a green seal with a valid receipt.

Boaters that lose a white receipt from prevention waters, or are returning to the same location with a valid white or blue receipt, and have an I/O, inboard or ballast tank will not be decontaminated per standing water rule 3A if the seal itself is intact and has no appearance of being tampered with. The inspector must educate the boater to keep their receipt in the future.

Some state parks have a pre-inspection policy in place. Blue receipts are only valid for pre-inspection if they are returning to the same location. No exceptions.

State of Colorado

INSPECTION AND DECONTAMINATION SEAL RECEIPT

For use when applying green seals to boats at Negative Prevention locations. Provide original to watercraft owner (white) and keep carbon copy (yellow).

WID Location: _____

Date: _____ Time: _____

Inspector's ID #: _____ Boat Type: _____

Vessel Registration (CL #): _____

Trailer Plate #: _____ Seal Serial #: _____

PROCEDURES PERFORMED (Every line must be checked to be valid)

Exit (HEAD) Inspection: Performed or Not Performed

Standing Water Decontamination: Performed or Not Performed

Full Decontamination: Performed or Not Performed

Plant Decontamination: Performed or Not Performed

Bait Decontamination: Performed or Not Performed

HOW TO TREAT A BOAT WITH A GREEN SEAL

Always ask about live aquatic bait and follow bait protocol. Cut off seal and let boat launch if one of the following are true:

- 1.) Boat is returning to the same location; or
- 2.) Boat has been decontaminated; or
- 3.) Boat is clean and fully drained.

If not, perform an inspection prior to launch.

NOTES:

CLEAN, DRAINED, AND DRY BOATS GET ON THE WATER FAST!

Distribution: White—Owner/Operator Yellow—Inspection Location
1 - 3/2023 - 100,000 RW1-9/17193-23

State of Colorado

INSPECTION AND DECONTAMINATION SEAL RECEIPT

For use when applying green seals to boats at ANS Containment waters. This receipt valid for State Park preinspection only at the location where it was issued.

WID Location: _____

Date: _____ Time: _____

Inspector's ID #: _____ Boat Type: _____

Vessel Registration (CL #): _____

Trailer Plate #: _____ Seal Serial #: _____

EWM NZMS Quagga Zebra

RETURNING BOAT Yes No

PROCEDURES PERFORMED (Every line must be checked to be valid)

Exit (HEAD) Inspection: Performed or Not Performed

Standing Water Decontamination: Performed or Not Performed

Full Decontamination: Performed or Not Performed

Plant Decontamination: Performed or Not Performed

Bait Decontamination: Performed or Not Performed

HOW TO TREAT A BOAT WITH A GREEN SEAL FROM A CONTAINMENT WATER

Always ask about live aquatic bait and follow bait protocol. Cut off seal and let boat launch if one of the following are true:

- 1.) Boat is returning to the same location; or
- 2.) Boat has been decontaminated.

If not, perform an inspection to check for standing water.

• If there is no standing water and the boat is clean and dried, allow launch.

• If any standing water is found, a standing water decontamination is required before allowing launch.

NOTES:

CLEAN, DRAINED, AND DRY BOATS GET ON THE WATER FAST!

Distribution: Blue—Owner/Operator Yellow—Inspection Location
2 - 3/2023 - 20,000 RW1-9/17193-23

Seal Tampering:

Colorado Parks and Wildlife regulations prohibit the defacing or tampering with any WID Seal or WID seal receipt.

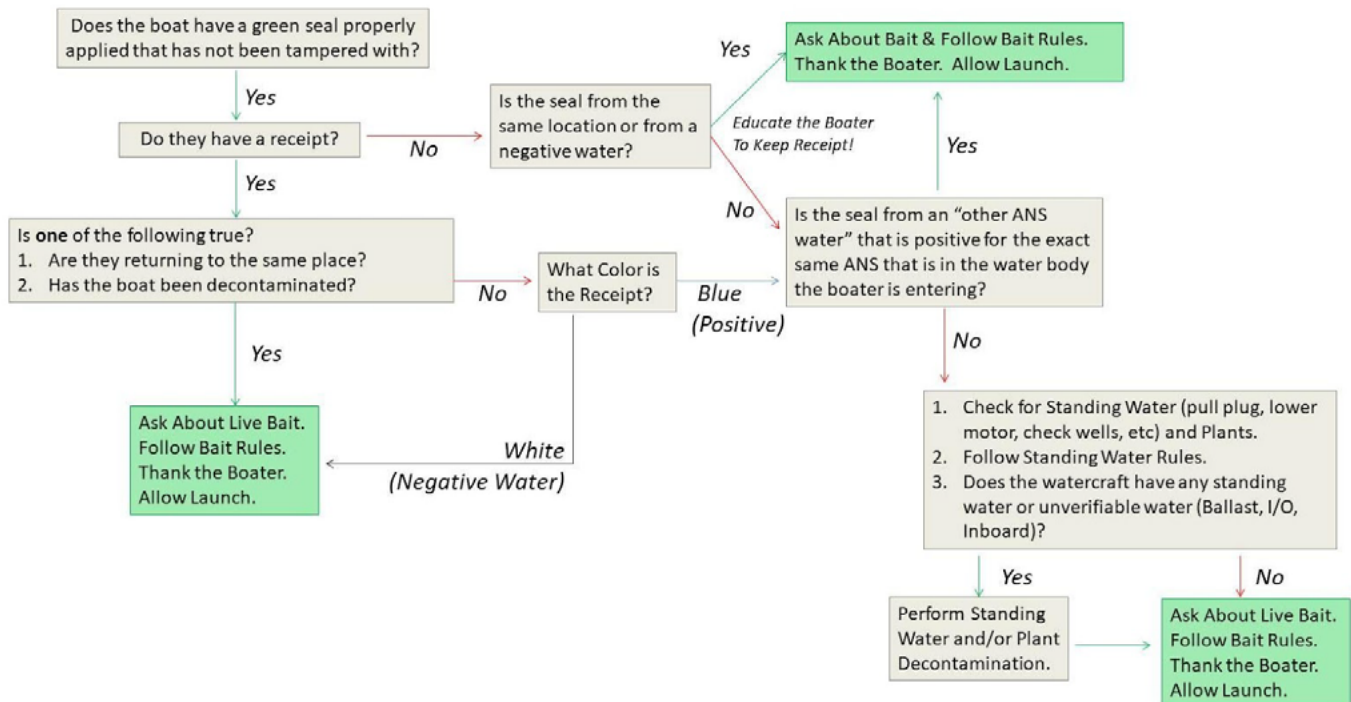
- Any WID Seal or WID seal receipt that has been defaced or tampered with is void.



A tampered seal in comparison.

- Any watercraft bearing a void WID seal or WID seal receipt must be inspected prior to launch.
- Any seal or receipt tampering should immediately be reported to your supervisor or law enforcement.

Green Seal Removal Flow Chart 2024



Seals Explained to the Public:

- Green does **NOT** mean go!
- A green seal is proof of prior inspection.
- It will speed up your entry to the next water.
- The boat operator still has to stop at the inspection station and have the seal and receipt verified.
- The boat will be allowed to launch if it is returning to the same location or the watercraft is clean, drained, and dry.
- If the boat is not returning to the same location it may get a quick check prior to launching.
- If the watercraft is not clean and dry, it will most likely get re-inspected.
- Keep watercraft clean, drained, and dry and get on the water fast!



How do I treat a seal that is NOT green?

Colorado greatly appreciates seals with receipts from all jurisdictions across the nation. This physical documentation indicates that a boat has not launched since the seal was applied and enables the inspector to adequately determine risk according to Colorado procedures. Colorado inspectors must utilize the information on the receipt to properly determine risk. Colorado is concerned about stopping the spread of all ANS, and not just zebra or quagga mussels. Therefore, inspectors should inspect the watercraft and follow standing water procedures and triggers for decontamination. Inspectors must use the accompanying seal paperwork, if any exists, to complete data requirements on the Activity Log or Data Collector.

Regional WID Data Sharing System

The Regional WID Data Sharing System (System) is in use at more than 200 locations across the west, including all 75 WID stations in Colorado. CPW developed the System and maintains ownership

and oversight. The states of Arizona, Montana, Nebraska, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming as well as the Lake Tahoe Regional Planning Agency, Solano County Water Agency, Mussel Dogs, and TiGE are now using the System as their primary form of data collection and management.

The purpose of the System is to record information related to WID electronically and to share information in a timely manner across jurisdictions to aid collaborative efforts to prevent the spread of zebra and quagga mussels and other ANS.

The System consists of a mobile application, website, and shared database hosted on a private server. The mobile application is compatible on all iOS and Android devices. This reduces the operating costs for mobile data collection and data entry while increasing accuracy. It provides for improved reliability in data collected in the field at WID stations, in addition to rapid query capacity for on-demand reporting. Lead agencies are able to customize the user interface of

the mobile application in alignment with both western regional standards and state laws, regulations, and priorities.



The System is used for data entry, viewing, editing, querying, and reporting. An included risk assessment tool shows where boats are moving after launching in mussel infested waters and sends an alert to the next known destination. With the benefits of data sharing proving to be abundant, the states of Arizona, Nevada and Utah have been using the System to send out timely electronic alerts of watercraft leaving infested waters. This increased timely communication has directly increased the number of infested watercraft being intercepted within the western region before launching in uninfested waters.

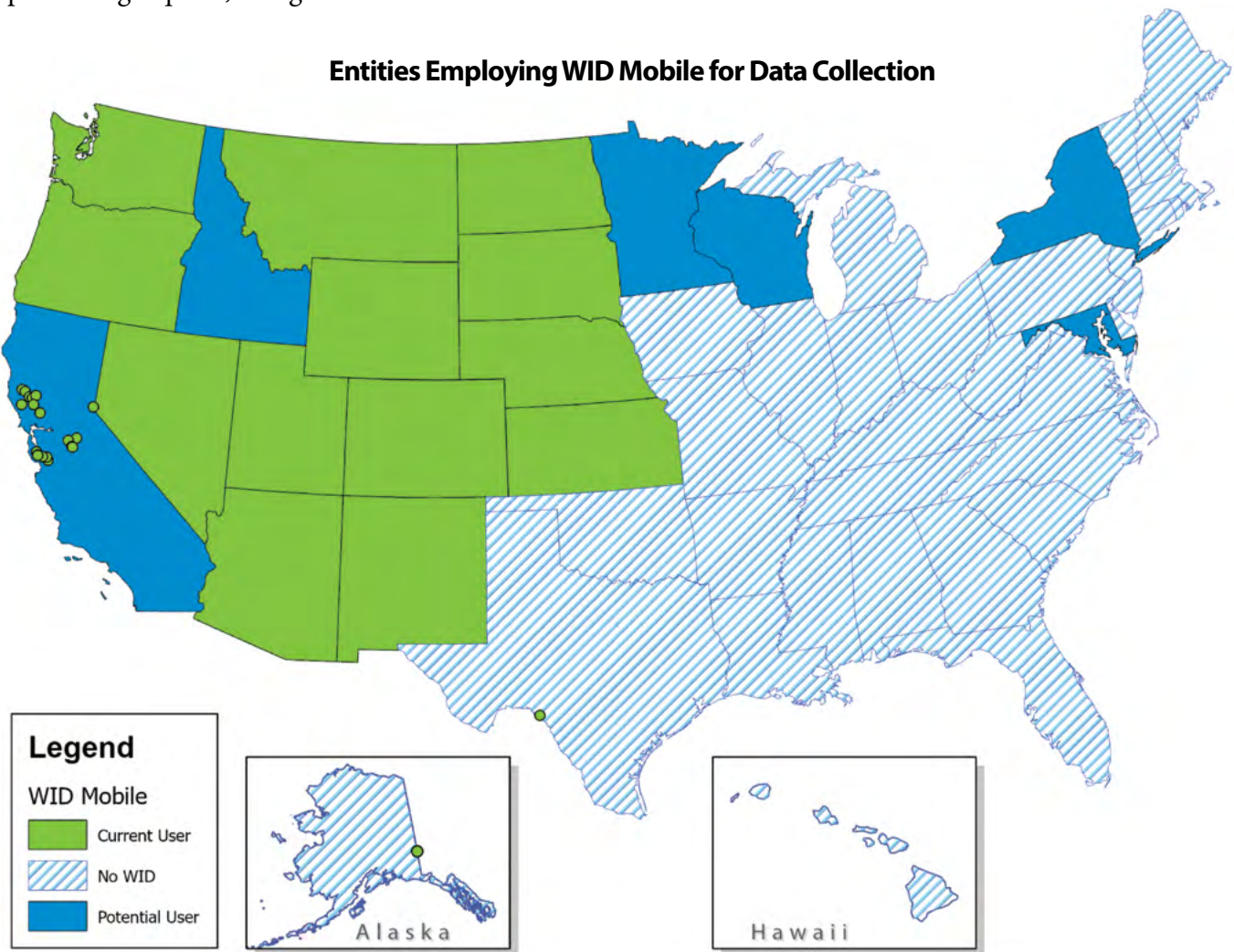
CPW manages and operates the System through a private industry contract utilizing federal grant dollars. The data itself is the property of the state agency that input the information. CPW leads a Governance Committee, consisting of user organizations that is charged with evaluating and prioritizing requests, changes and enhancements.

The Governance Committee works to collectively determine the viability and usefulness of new technologies.

It is expected that this System will become industry standard for entities performing WID. As users increase, this system will continue to improve communications among jurisdictions to enable field staff and managers to accurately focus resources towards effective risk mitigation related to the prevention and containment of zebra and quagga mussels and other harmful ANS.

Inspectors must use the system in real time in order to benefit from the many features that help to determine risk at the ramp. Also, the data collected is imperative to inform the budget and other decisions related to WID operations. Obtaining accurate and timely information is imperative for success.

Entities Employing WID Mobile for Data Collection



Inspection Protocols

The following science-based standard protocols have proven effective to identify and intercept watercraft harboring zebra or quagga mussels, New Zealand mudsnails, and noxious weeds including Eurasian watermilfoil. By following these protocols and educating boaters, you WILL prevent the spread of ANS.



Step-By-Step Procedures for Inspections:



Entrance Inspection Procedure: ***Prevention and Containment Waters*** ***or Off-Water Stations***

This is the complete inspection that is performed at WID stations on watercraft entering the lake or reservoir regardless of status (infested, positive, suspect, or negative), in addition to WID stations that are not located on a lake or reservoir (e.g. offices, businesses, or roadsides). This procedure includes both a screening interview and a visual and tactile inspection of all portions of the watercraft and trailer that could come into contact with water.

Step 1: Greeting, Safety and Educate the Boater

- Introduce yourself
- Inspectors should ask the driver to turn off the engine, put on the parking brake and step out of the vehicle
- Provide the boater with a brochure or educational item
- Provide a brief verbal explanation of the purpose of the inspection
- Provide an explanation of what you are looking for (e.g. mud, water, plants, and animals)

- Provide guidance on Clean, Drain, Dry practices
Note: Consider putting chocks under the wheels of the vehicle and the trailer. The inspectors may have to get under the trailer and climb on the watercraft, so it is important to prevent boats or the trailer from rolling.

Step 2: Initial Assessment

- Record on the Activity Log or in the Mobile Application (Data Collector) the following information:
 - Incoming or Off-water
 - Boat Registration or HIN Number
 - Boat Trailer License Plate
 - Boat Type
 - Propulsion Type
- Check for Seal and Receipt
 - If present, determine if the boat is a low risk or **high-risk** conveyance:
 - *Low-risk boats are defined as those with:*
 - Green seal + matching receipt from the same location
 - Green seal + matching receipt from a known negative location
 - Green seal + matching receipt for the same ANS present in the receiving water

Perform Seal Removal for Low-risk Boats:

- Verify seal and receipt match and seal has not been tampered with
- Ask about live aquatic bait and follow bait protocol
- Thank the boater and allow launch.
- ***High-risk boats are defined as those that:***
 - Do NOT have a seal with matching receipt
 - Have a seal or receipt that has been tampered with
 - Have a seal that is not from Colorado
 - Have a green seal with a matching receipt with an ANS not present in the receiving water

*****Continue onto steps 3–6 for High-risk Boats.***



Step 3: Ask about Live Aquatic Bait

- Ask the boater if they have live aquatic bait.
 - If yes, follow bait procedure
 - If no, continue with the inspection

Step 4: Determining Risk Factors.

This is like airport security—you are screening for rare events. Inspectors will need to look at a lot of boats quickly to determine if there is a high risk. There are two very important questions that must be asked first. Record in the Mobile Application (Data Collector) the answers provided to the following questions:

- Has the boat launched out of state in the last 30 days?
 - If yes, where?
- Where has the boat launched in the last 30 days?
 - Listen carefully and pay attention to notice if any of the locations listed are suspect, positive, or infested.

Step 5: Perform the visual and tactile entrance inspection of the watercraft, using the acronym **H.E.A.D.** to ensure that the watercraft is properly inspected.

Hull and Trailer—Rapid Exterior Inspection

- Look over (visual) and feel (tactile) the entire watercraft on both sides of the hull and trailer.
- Physically inspect the through hull fittings
- Check trailer bunks or rollers, tire wells, lights and electrical.
- Remove any plants or plant fragments that are present.
- Check to see if the bilge plug(s) are installed. If it is installed, check for water in bilge prior to removing the plug.



- If it is installed, ask the boater to remove the bilge plug away from the water to allow draining.
- Physically and visually inspect the bilge area and use a flashlight to visually see if any ANS or standing water are present.
- If applicable, have the boater activate the bilge pump.
- If the watercraft has an inboard engine, be certain to carefully inspect the prop, prop shaft and rudder.
- Inspect intakes for ballasts, engines, and other interior systems and compartments.

Note: *Through hull intakes and discharge ports will be a good indicator that more complicated systems may be on board.*

Note: *It is important to explain what you are looking for and educate boaters so that they can inspect their own boats. It is important to start and end the inspection at the same place on watercraft. Look the boat over and feel the hull with the boater. The young mussels may feel like bumps or sandpaper on the watercraft. Trailers can pose as high of a risk as boats, so carefully check trailer rails, lights and electrical wires, as well as the license plate and trailer pads. This is a good opportunity to use your inspection mirrors and flashlights to look at difficult nooks and crannies on the underside of the boat.*

Engine or Motor

- Visually and physically inspect the drive unit with a flashlight when it is in trailer mode (up).
- Ask for the outboard or I/O to be lowered.
- Visually and physically inspect the gimbal area of the outboard or I/O with a flashlight.

- Visually and physically inspect the transom or rear of the boat and any attached instruments including but not limited to:
 - Pitot tubes, trim tabs, transducers, etc.
- Ask the boater to raise the drive unit to avoid damage during transport.

Anchor and Equipment Checked

- Ask to see the anchor and anchor line or chain.
- Visually and physically inspect the anchor and line or chain for mud, plants, and other ANS.
- Ensure all water related equipment is clean and dry including but not limited to:
 - Bait buckets, water toys, fenders, auxiliary pumps, etc.

Drain and Check Interior Compartments

For larger craft, you will need to get into the watercraft to inspect interior compartments that could hold standing water (e.g. live wells). For smaller craft, you may be able to see without entering the watercraft. Ensure that the watercraft is drained to the best of your ability.

- Ask for permission to board the watercraft and ask the boater to climb in first. Follow the boater into the watercraft the same way they entered. Be careful to prevent either the boater or inspection staff from falling or getting hurt. Always maintain three points of contact with the watercraft and never jump off.
- Ask the boater to open compartments so you can see all bait wells, live wells, equipment lockers and verifiable ballast tank.
 - If the watercraft has standing water in the bait well or in any container, the inspector should work with the boater to remove



- standing water from the watercraft using a pump, sponge, or towel. If the watercraft can't be drained, it should be decontaminated.
- If the watercraft has a ballast system, inspect for standing water.
 - Request that the boater activate all discharge pumps and open any water restricting gates for the ballast system
 - Inspect any accessible ballast tanks/bags through ballast ports
 - Refer to decontamination protocol for reference on how to address standing water in ballast systems.
- If the watercraft has an inboard or I/O engine, inspect the engine compartment and its bilge. Have the operator run the bilge pump, if applicable. These engines do not drain fully and may require a standing water decontamination prior to launching.
- If the watercraft has any sea strainers or water filtration devices, request that they be removed by the boat owner. Inspect all sea strainers once removed from the watercraft. Have the boat operator re-install the strainers following inspection.

Step 6: Closeout

- Remind the boater to replace bilge plug prior to launch. The boater is responsible to ensure the watercraft is watertight before launching.
- Ensure the drive unit has been raised to avoid damages during transport.
- Seal and Receipt
 - If working at a lake or reservoir, encourage the boater to get an exit inspection with a seal and receipt upon exit to make the inspection process much quicker next time around.
 - If working at an Off-water location, apply a seal and provide the boater a seal receipt.
- Ensure all inspectors have completed inspection and that nothing was found.
- Provide the boater with any additional educational materials.
- Thank the boater for their efforts to Clean, Drain, and Dry.
- Yell "Stand Clear" to ensure the safety of staff and the public.
- Complete the WID Activity Log or submit the mobile application record.



Exit Inspection Step-By-Step Procedure—Prevention Waters

Exit Inspections are performed at lakes, rivers, and reservoirs only. It is critically important to make an additional educational contact with the boater reinforcing that watercraft should be clean, drain and dry in between each use. It also verifies that the boater has followed the proper procedures to clean off the watercraft and completely drain all compartments prior to leaving. Repeat the primary educational message Clean, Drain, Dry and explain why boaters need to do it each time they use their watercraft.



The priority for exit inspections is to inspect for invasive species, drain water, remove plants, and apply a seal and receipt to the watercraft. Perform the exit inspection below to ensure the watercraft leaves clean and drained to the best of the inspector's ability.

Step 1: Greeting, Safety and Educate the Boater

- Introduce yourself.
- Inspectors should ask the driver to turn off the engine, put on the parking brake and step out of the vehicle.
- Provide a brief verbal explanation of the purpose of the exit inspection.
- Provide guidance on Clean, Drain, and Dry practices.

Step 2: Initial Assessment

- Record on the Activity Log or in the Mobile Application (Data Collector) the following information:
 - Outgoing
 - Boat Registration or HIN Number
 - Boat Trailer License Plate
 - Boat Type
 - Propulsion Type

Step 3: Live Aquatic Bait

- Ask if they have live aquatic bait.
 - If yes, follow bait procedure in the decontamination chapter.
 - If not, continue with inspection.

Step 4: Perform the visual and tactile exit inspection of the watercraft, using the acronym H.E.A.D. to ensure that the watercraft is properly inspected.

Hull and Trailer—Rapid Exterior Inspection

- Look over (visual) and feel (tactile) the entire watercraft on both sides of the hull and trailer.
- Physically inspect the through hull fittings.
- Check trailer bunks or rollers, tire wells, lights and electrical.
- Remove any plants or plant fragments that are present.
- Ask the boater to remove the bilge plug to drain the watercraft when inspecting the transom.
- Physically and visually inspect the bilge area and use a flashlight to visually see if any ANS or standing water are present.
- If applicable, have the boater activate the bilge pump.
- If the watercraft has an inboard engine, be certain to carefully inspect the prop, prop shaft and rudder.
- Inspect intakes for ballasts, engines, and other interior compartments.

Note: Through hull intakes and discharge ports will be a good indicator that more complicated systems may be on board.

Note: It is important to explain what you are looking for and educate boaters so that they can inspect their own boats. It is important to start and end the inspection at the same place on watercraft. Look the boat over and feel the hull with the boater. The young mussels may feel

like bumps or sandpaper on the watercraft. Trailers can pose as high of a risk as boats, so carefully check trailer rails, lights and electrical wires, as well as the license plate and trailer pads. This is a good opportunity to use your inspection mirrors and flashlights to look at difficult nooks and crannies on the underside of the boat.

Engine or Motor

- Visually and physically inspect the drive unit with a flashlight when it is in trailer mode (up).
- Ask for the outboard or I/O to be lowered.
- Visually and physically inspect the gimbal area of the outboard or I/O with a flashlight.
- Visually and physically inspect the transom or rear of the boat and any attached instruments including but not limited to:
 - Pitot tubes, trim tabs, transducers, etc.
- Ask the boater to raise the drive unit to avoid damage during transport.

Anchor and Equipment Checked

- Ask to see the anchor and anchor rope or chain.
- Visually and physically inspect the anchor and rope or chain for mud, plants, and/or ANS.
- Ensure all water related equipment is clean and dry including but not limited to:
 - Bait buckets, water toys, fenders, auxiliary pumps, etc.



Drain and Check Interior Compartments

If all interior compartments cannot be fully inspected from outside the watercraft, you will need to enter the watercraft to inspect interior compartments that could hold standing water. Ensure that the watercraft is drained to the best of your ability.

- Ask for permission to board the watercraft and ask the boater to climb in first. Follow the boater into the watercraft the same way they entered. Be careful to prevent either the boater or inspection staff from falling or getting hurt. Always maintain three points of contact with the watercraft and never jump off.
 - Ask the boater to open up compartments so you can see all bait wells, live wells, equipment lockers and verifiable ballast tanks. The inspector should work with the boater to remove standing water from the watercraft using a pump, sponge, or towel. Ensure that the compartments are drained to the best of your ability. Remind the boater to dry at home.
 - If the watercraft has a ballast system, inspect for standing water.
 - Request that the boater activate all discharge pumps for the ballast system.
 - Inspect any accessible ballast tanks/bags through ballast ports.
 - If the watercraft has an inboard or I/O engine, inspect the engine compartment and its bilge. Have the operator run the bilge pump, if applicable.



Important Notes for Containment (Suspect or Positive) Reservoirs

At containment reservoirs, it is mandatory that all boats be inspected upon exit.

The main focus of containment in Colorado is to make sure standing water does not leave the reservoir on a watercraft. The reason for this is because to date, only one detection of adult mussels has occurred in Colorado and the rest have been veligers (microscopic larvae) or environmental DNA which have been since delisted.

The difference between containment and prevention exit protocols is that at containment reservoirs the priority is focused on draining standing water and performing standing water decontaminations, in addition to ensuring that no plants, mud, or animals leave the lake or reservoir on or in watercraft.

The goal for containment waters is such that all exiting boats get a thorough and complete inspection and are issued a green seal and a matching receipt. If the watercraft can't be drained during the exit inspection, and is intended to launch in a different location next, it must get a standing water decontamination prior to leaving. All watercraft using ZQM Containment waters must be recorded in the Data Collector.

Note: Not all locations positive for EWM or NZMS have watercraft inspection and decontamination stations.

Containment locations issue green seals and BLUE receipts for exiting boaters. The blue receipt provides a visual warning to the next inspector that the watercraft is from a positive or suspect water body. Note, the new printed receipts will all be white. However, they will have the ANS at that waterbody listed visibly on the top of the receipt. Follow seal removal protocol for boats from containment waters.

If at any point suspect or known ANS are found, or the watercraft can't be drained → send to decontamination.

Step 5: Apply Seal and Provide Valid Receipt

- Properly apply a seal to watercraft and trailer.
- Provide a copy of the seal receipt properly filled out.
- Explain that the seal is valid only if the receipt is kept and the seal remains intact.

Step 6: Closeout

- Ask the boater to leave the bilge plug out during transport to ensure extra dry time.
- Ensure the drive unit has been raised to avoid damage during transport
- Ensure all inspectors are finished looking at the watercraft and that nothing was found.
- Provide the boater with any additional educational materials.
- Thank the boater for their efforts to Clean, Drain, and Dry.
- Yell “stand clear” to ensure the safety of staff and the public.
- Complete the WID Activity Log or submit the mobile application record.



Exit Inspection Procedure at ZQM Containment Reservoirs for Unverifiable Water (Ballast, Inboard, I/O):

Ask the boater where they plan to launch the watercraft next.

- If they are planning to return to the same reservoir → inspector performs an exit inspection including having the boater run the ballast or engine pumps and expunge interior water → issue green seal and blue receipt and enter the inspection record in the data collector.
- If they are planning to launch the watercraft in a different reservoir, or they do not know where they are going to launch next → inspector performs an exit inspection, including having the boater run the ballast or engine pumps and expunge interior water → **perform a minimum of a standing water decontamination** → issue green seal and blue receipt.

Note: There are rare occasions when the weather is unsafe for inspectors to be working (e.g. Lightning and hail) and therefore large volumes of boaters can leave containment reservoirs without inspection, draining or decontamination. It is imperative that these boats get intercepted and decontaminated before entering the next reservoir. The same is true for ballast boats intending to return to the same location and go somewhere else instead.



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Roadside Watercraft Inspection & Decontamination

In 2021, the Colorado State Legislature passed HB21-1226, More Robust Aquatic Nuisance Species Check Stations. This legislation provided CPW the authority to inspect and decontaminate watercraft at roadside locations. In 2022, CPW launched the ANS watercraft inspection and decontamination roadside stations pilot program, inspecting high-risk watercraft through three separate events at Colorado’s Loma Port of Entry, west of Grand Junction. This initial pilot program resulted in the interception of 26 mussel-fouled watercraft. After a successful first year, CPW expanded the program in 2023 to operate nine stations at multiple ports of entry and welcome centers across Colorado. Based on the information gathered in 2022 and 2023, CPW determined that the Loma and Trinidad Ports of Entry would be the highest impact locations for the next phase of the program, as they saw the highest number of high-risk out-of-state motorized boats.

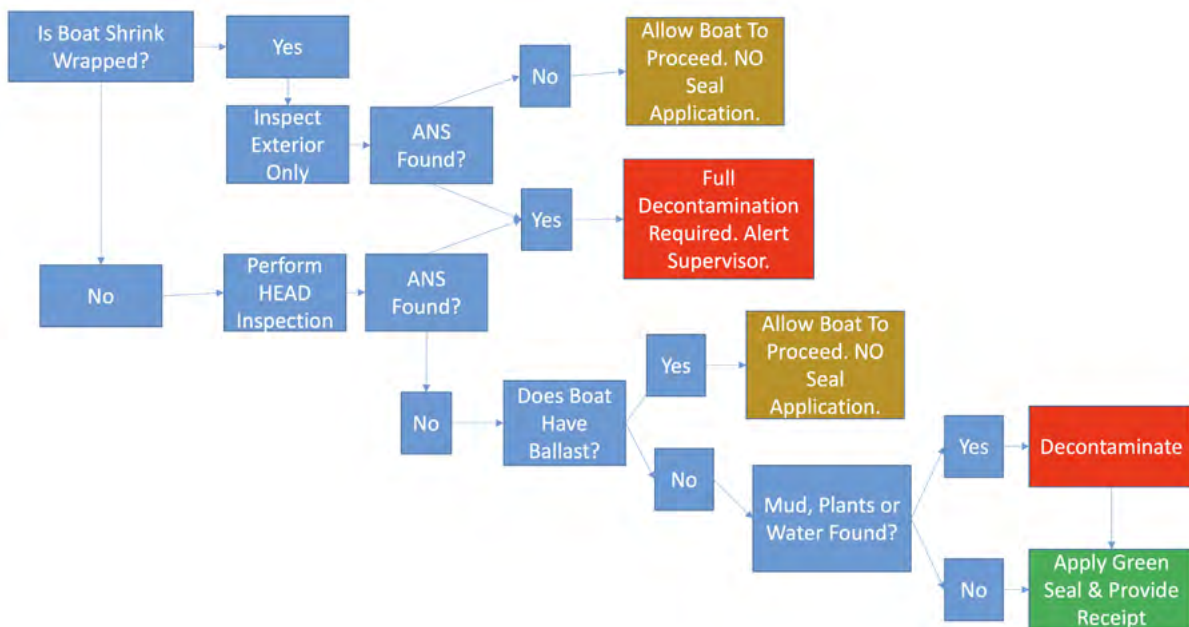
With the opening of the full-time roadside stations this year, any vehicle with a motorized or trailered watercraft entering the state on I-70 east from Utah (Loma Port of Entry) or I-25 north from New Mexico (Trinidad Port of Entry) will be required to stop for an inspection Thursday - Monday, from March 14 through Oct. 31.

Roadside Protocols:

The same protocol as all other WID stations in the state is being implemented with the following exceptions:

- Ballasted boats will not be decontaminated at roadside locations unless ANS is found. Ballasted boats will be inspected for ANS and documented as being inspected in the database, but they will not be issued a seal and receipt. These boats should still be decontaminated at their final destination.
- Shrink wrapped boats will not be unwrapped. What is visually accessible will be inspected and if no ANS is identified they will be logged in the database but will not be issued seals and receipts.
- Vessels that cannot be operated that require decontamination will be inspected and documented in the database but not issued a seal and receipt. Notes will be made in the database as to why decontamination could not be performed.

The following flow chart details this modified inspection protocol:



Additional Considerations for Inspecting a Personal Watercraft (PWC)

Personal Watercraft (PWC) have a unique configuration and specific components that require additional considerations when performing an inspection. While the majority of the inspection protocol is unchanged when inspecting a PWC, the following modifications to the visual and tactile inspection of the watercraft should be implemented to ensure a fully cleaned, drained, and dry watercraft.

Perform the visual and tactile inspection of the watercraft, using the acronym H.E.A.D. to ensure that the watercraft is fully inspected.

Hull and Trailer—Rapid Exterior Inspection

- Look over (visual) and feel (tactile) the entire watercraft on both sides of hull and trailer.
- Physically inspect the through hull fittings.
- Check trailer bunks or rollers, tire wells, lights and electrical.
- Inspect the intake grate on the underside of the PWC.
- Remove any plants or plant fragments that are present.
- Ensure the boater has removed the bilge plug(s) when inspecting the transom. There are often two bilge plugs on a PWC—one on each side of the jet.



- Physically and visually inspect the bilge area (e.g. feel the bilge area) and use a flashlight to visually see if any ANS are present.
- If applicable, have the boater activate the bilge pump.

Jet Engine

- Visually and physically inspect the jet (steering nozzle) with a flashlight.
- Visually and physically inspect the transom or rear of the watercraft with a flashlight.
- Stand clear and ask the operator to start the PWC.
- Once started, have the operator rev the engine 2–3 times to ensure the engine and exhaust cooling systems are free of water.
- If water is expelled from the jets during this process the watercraft should be sent for decontamination.

Anchor and Equipment Checked

- Ask to see the anchor and anchor rope or chain.
- Visually and physically inspect the anchor and rope or chain for mud, plants and/or ANS.
- Check any additional equipment such as life vests, buoys, paddles, ropes, nets, etc.
- Ensure all equipment is clean and dry.

Drain and Check Interior Compartments

- Ask the operator to raise the seat of the PWC
- Inspect the engine compartment for mud, water, plants and mussels using a flashlight
 - Ask the boater to open the compartment in front of the handlebars.
 - Inspect the engine compartment for mud, water, plants and mussels using a flashlight.
 - If the watercraft has standing water in either of these compartments, the inspector should work with the operator to remove standing water from the watercraft using a pump, sponge, or towel. If the watercraft cannot be drained, it should be decontaminated.
 - Ensure that the compartments are fully drained to the best of your ability prior to launch.

Rules for Standing Water

It is imperative that standing water be drained from watercraft to prevent the movement of microscopic mussel larvae or veligers, plant fragments, diseases, and other animals from being transported. Inspectors must pay careful attention to any compartment that cannot be completely drained and therefore may contain standing water. Zebra and quagga mussel veligers are microscopic and can be transported in water, capable of surviving up to 27 days in watercraft compartments.

There are two types of water on boats:

Verifiable Water—This is water in compartments that you can see, feel, or visually inspect, such as in wells or bilges. This is the majority of water on the boats you will inspect.

Unverifiable Water—This is water in compartments that you **cannot** see, feel, or visually inspect. Ballast, I/O engines, and Inboard engines all carry unverifiable water.

Rule #1—Mandatory Decontamination for Watercraft with Standing Water from Listed or Unknown Locations

If the watercraft has been in suspect, positive, or infested waters and has any standing water, it is mandatory to send the watercraft to decontamination.

Especially in cases where the watercraft has an I/O or Inboard engine, or a ballast tank or bag, it is mandatory to send the watercraft to

decontamination and thoroughly flush those compartments.

Rule #2— Watercraft with Verifiable Water

Incoming watercraft that is not green sealed from unknown sources or from prevention waters should be clean, drained, and dry. Sponge, pump, or towel out standing water, or decontaminate, prior to allowing launch.

On exit from prevention and other ANS containment reservoirs, drain to the best of your ability including pulling water drain plugs and remind the boater to dry their watercraft.

Rule #3—Boats with Unverifiable Water (e.g. Ballast, I/O, and Inboard Engines) for Unverifiable Water

Follow the procedures A–C below for boats with unverifiable water in ballast tanks

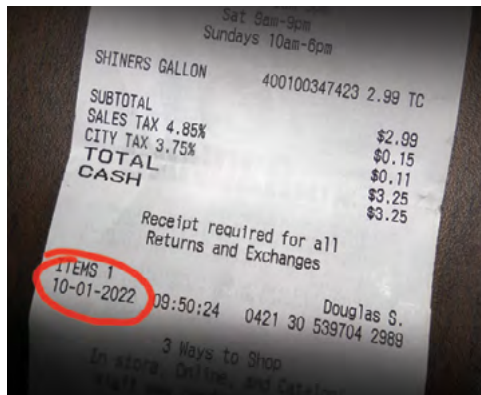
- A. Watercraft without a green seal or receipt must get a mandatory standing water decontamination.
- B. Watercraft returning to the same location with a green seal and receipt must be fully drained and do not require decontamination.
- C. Watercraft moving between Colorado prevention (negative) waters with a green seal and white receipt must be fully drained and do not require decontamination.

Educate all boaters to get green seals and receipts when exiting the WID Station!

Live Aquatic Bait

What do the regulations say about live aquatic bait?

Colorado Parks and Wildlife regulations require that **all live aquatic bait must be purchased from an authorized Colorado bait dealer** and must be accompanied by a **dated receipt**. The receipt is valid for ANS inspections for **seven days**.



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- Live fish are only allowed for use as bait on the East Slope below 7,000 feet and at Navajo Reservoir.
 - In those areas, the transportation of live fish as bait is prohibited between waters unless it was purchased from a Colorado bait dealer, as described above.
 - Fish harvested in the wild for use as live bait can only be used in the water in which it was caught and cannot be transported or stored for later use.
 - *The exception is fish harvested within Baca, Bent, Crowley, Kiowa, Otero, or Prowers counties which can be transported and used only within those six counties.*
- The transportation of live crayfish is prohibited on the west slope and from Sanchez Reservoir.
- It is unlawful to transport live bait across state lines without an importation permit.

What is the protocol for live aquatic bait treatment?

If a vessel has live aquatic bait in a container or a well with standing water, be sure to check the “Live Bait Present” field on the mobile application in the data collector. Then ask the boater for a bait receipt.

Note: Under Colorado Fishing Regulations only live fish bait mandates a receipt that lists the name of the bait and the quantity/number. Other live aquatic bait (e.g. crayfish or salamanders) may only have a basic store receipt without that information.

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In places where live bait is allowed, the inspection or treatment will vary depending on the location and type of bait.

If the boater has bait in a container with standing water, allow them to proceed and launch with the bait if the following three items are all true:

- The receipt is from a Colorado bait dealer **and**
- The receipt is dated no more than seven days **and**
- The species listed on the receipt matches up with the bait in question.

If the receipt is older than seven days, perform a bait treatment to remove the threat of ANS in the water. Ask the boater to remove the bait from the vessels live well or container and **place it into a holding container**. The live well or container must be drained and decontaminated using standard decontamination procedures (120°F hot water rinse with low pressure) before the bait is returned.



If entering, the container or well water can be replaced with water from the lake or reservoir the boat is launching in.

If the boater DOES NOT have a receipt the live aquatic bait will not be permitted for use and will have to be properly disposed of in the trash. However, the following scenarios will result in the bait being allowed following a treatment:

- If the bait is fish and was harvested within ½ mile of the reservoir from man-made ditches or canals.
- If the bait is fish and was harvested within the SE six county exemption (John Martin Reservoir).
- If the bait is wild harvested non-fish bait (crayfish, frogs, or salamanders).

Out of state bait is not permitted for use.

When the boater leaves your water, encourage him or her to properly dispose of unused bait in the trash, never in the water. Completely drain the live/bait well and any other containers. The container or well may need to be sponged, towed, or pumped to get the water out so that nothing leaves the reservoir.

Note: Any live aquatic bait purchased from an out-of-state dealer is illegal and must be disposed of in the trash. Do not allow it to be used at your water body.

What Options Does the Angler have if the Live Aquatic Bait is Not Allowed?

If the live aquatic bait is not allowed at that site, the angler has a few options:

- Leave the bait in the car or truck.
- Dispose of the bait in the trash.
- Go fishing at a different reservoir where that bait is allowed.

Reporting

All persons have a duty to immediately report suspect or known ANS to CPW per state law. If you see something you think is an ANS while you are working or playing in the outdoors, please report it to the ANS Program Office. The ANS Act requires that any person who knows or suspects an ANS is present (plant, animal, or pathogen) must immediately report the suspect to the ANS Program.

There are three options for general reporting:

- State ANS Program Office: 1-303-291-7295
- Email: Invasive.Species@state.co.us
- Website: <https://cpw.state.co.us/aboutus/Pages/ISP-Report-Invader.aspx>

WID Reporting Requirements

WID Supervisors must send ANS WID Activity Logs to CPW Invasive Species Program at 6060 Broadway, Denver, CO 80216 at the end of each month. **OR** enter the data into the excel template provided and email excel files to Invasive.Species@state.co.us.

Data collector users will send data into the online database via cellular or MiFi. For assistance with the ANS web or mobile application, please contact the Istonish help desk at helpdesk@istonish.com or 1-888-390-7275.

If you suspect that there is an ANS on a watercraft or in the reservoir (e.g. unidentifiable bumps on a boat or plants/animals in the reservoir), it is required that you collect the specimen, properly document, and report prior to decontamination. See Chapter 6 for detailed procedures regarding suspect watercraft and intercepting “mussel boats”. You or your supervisor must notify the ANS Program immediately via email, text or phone call. Documentation, samples, and photographs must be sent in within 24 hours.

Full Decontamination:

- Document
- Report
- Collect
- Decontaminate
- Re-Inspect

Do not allow a known mussel boat to leave the WID Station without decontamination. Call Law Enforcement if the boat operator is not compliant and you need help!

State Parks Pre-Inspection Program

Pre-Inspection is a program in place at select State Parks to provide access

when inspectors are not present. Boaters that launch during pre-inspection hours must have a valid green seal and receipt prior to launching or they will be subject to fines.



1. Green seals with white receipts are valid for pre-inspection anywhere.
2. Green seals with blue receipts are only valid for pre-inspection at the same site the seal was issued or following decontamination.
3. Seals that are not green, including out of state seals, are **NEVER** valid for pre-inspection.

Important Note: *The new printed receipts will all be white. Lakes with ANS will be clearly marked with a note they are only valid for Pre-Inspection at the same lake the receipt was issued from.*

Criteria for Pre-Inspection Implementation

- The State Park must have law enforcement patrol available, preferably overnight, but definitely outside of inspection station hours of operation.
- The State Park is prohibited from closing or locking the ramps outside of inspection hours.
- The State Park is not a ZQM Containment water or has not been de-listed for ZQM in the past.
- Pre-Inspection is approved by the reservoir owner and water operators.

In State Parks with pre-inspection, the certified “Agent” must inspect boats according to state protocol when the inspection station is open. When the inspection station is not open, boats must provide proof of prior inspection by entering their own information into a log book and placing their seal and receipt into a drop box on the boat ramp.

Procedure for Pre-Inspection

Boat Operators:

- Cut off the green seal.
- Fill out the log paperwork.
- Place the green seal and matching receipt in the drop box at the boat ramp.
- Launch the boat.

WID Station Staff:

- Upon opening the station in the morning, compare the pre-inspection logs to the seals and receipts in the drop box, and to the trailers in the parking lot.
- Identify any violators and provide that information to Law Enforcement.

Note: *Violators must be intercepted on the water or as they come off the water. Violators may be issued a citation.*

Regulations for Citation

#103-n.5 pursuant to Title 33-10-106(2) (d) C.R.S.
*Unlawful [(launching) (attempt to launch) (operating) (removal)] of any [(vessel) (floating device)] without first submitting the [(vessel) (floating device) (specific equipment name) (associated equipment)] to inspection. V-Code: 6292 L **Fine: \$50.00***

Title 33-10.5-105(1) (c) C.R.S.: *No person shall knowingly or willfully refuse to comply with a proper order issued under this article. (First Offense)*
V-Code: 6292X **Fine:\$150.00**

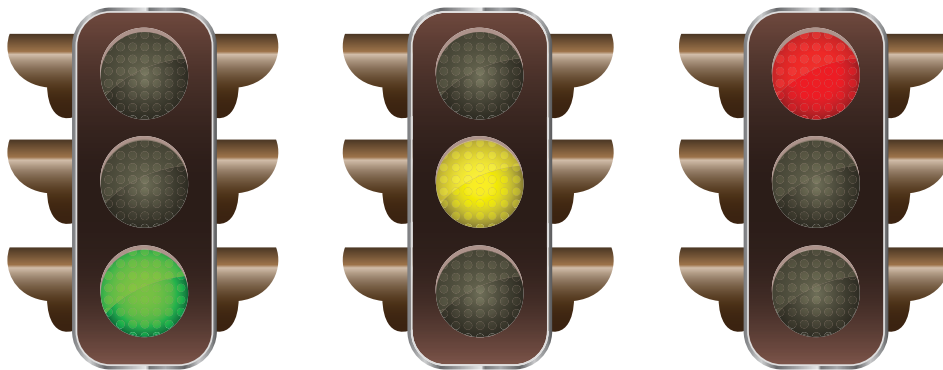


Outdoor Small Group Session— Inspection Practice

Practice performing inspections and learn the protocols. Work in small groups of 2–3 people: Inspector, Boater, and Observer.

- The Inspector should use the Data Collector or Activity Log.
- The Boater should answer questions following the scenarios below.
- The Observer should use the Quality Control Form.

Once the practice inspection is complete, the Observer can report back to the group what was done well and what needs to be improved upon. Then switch jobs until each group member has been an Inspector, Boater, and Observer.



Outdoor Hands-On Inspection Practice— Boater Scenarios

Boater #1

The last place you were boating is Chatfield State Park. You have not been out of the state in the last 30 days. You have not been to any suspect, positive or infested waters in the last 30 days. You have been inspected before but are not well educated. You have no live aquatic bait. You have no ballast tanks.

Boater #2

The last place you were boating is Blue Mesa Reservoir. You have not been out of the state in the last 30 days. You have not been to any suspect, positive or infested waters in the last 30 days. You have been inspected before and appear to be well educated. You have no live aquatic bait. You have no ballast tanks.

Boater #3

The last place you were boating is Sylvan State Park (in South Dakota). Let the boat inspector ask you **BOTH** questions to learn that your last boating place was out of state. You have not been to any suspect, positive or infested waters in the last 30 days. You have never been inspected before. You have no live aquatic bait. You have no ballast tanks.

Boater #4

The last place you originally say you were boating at is Lon Hagler SWA (there is no WID station there).

In the last 30 days you claim to have boated at Chatfield, Horsetooth, Lake John, Eleven Mile, Elkhead, McPhee, and Antero (all four corners of the state). You later change your story and tell the inspector that you were really at Green Mountain last weekend. You appear very well educated

about boat inspections and ANS—almost too well educated as if you are trying to avoid an inspection or decontamination by hiding the fact that you were at Green Mountain. You have no live aquatic bait. You have no ballast tanks.

Boater #5

The last place you were boating is Carter Lake. You have not been out of state or to any suspect, positive or infested waters in the last 30 days. You have wild harvested crayfish with no receipt in standing water in your live well. You have no ballast tanks. Your boat is really dirty, crusty, and slimy.

Chapter 5 Review Questions

1. Our goal as inspectors for every boat is no _____, _____, _____, and _____.
2. Rank the following in order of priority as an inspector (1–5, with one being most important).
_____ Drain _____ Inspect—Assess Risk _____ Safety
_____ Educate the Boater _____ Decontaminate
3. Name three items that are mandatory equipment for an inspector during an inspection.

4. Which of these vessels should be impounded according to the Colorado protocol?
 - a. The vessel with confirmed ANS and the boater refuses decontamination.
 - b. The boater who is unhappy with the inspection process.
 - c. The boater just came from Wyoming with standing water and it's raining on the boat ramp.
 - d. The boater has six gallons of ice and pop in the built-in cooler in their boat.
5. Circle true or false for the following statements about green seals.
 - a. Green means go! True or False
 - b. A green seal is proof of prior inspection. True or False
 - c. It will speed up your entry to the next water. True or False
 - d. You do not have to stop at the inspection station and have the seal and receipt verified. True or False
 - e. You will be allowed to launch if you are returning to the same location or the watercraft is clean and dry. True or False
 - f. If the watercraft is not clean and dry, you will most likely get re-inspected. True or False
6. As a civilian “authorized agent” you have the authority to:
 - a. Impound watercraft
 - b. Order a decontamination
 - c. Search watercraft for alcohol and drugs
 - d. Perform an inspection or decontamination with the permission of the operator
 - e. None of the above

7. Which of the following is a way to remember how to do the hands-on part of an inspection?
- H.E.A.D.**—Hull/Trailer, Engine/Motor, Anchor and Anchor Rope, Drain Interior Compartments
 - B.O.A.T.**—Bait, Outboard, Anchor, Transom
 - F.I.S.H.**—Front, Interior, Sails, Handrails
 - C.D.D.**—Clean, Drain, Dry
8. At Other ANS Positive Containment reservoirs, it is _____ that all boats be inspected upon exit.
- Mandatory
 - Voluntary
 - Mandatory only if the inspector has time
9. Which boats get a mandatory decontamination after boating in a containment reservoir? (circle all that apply)
- Boats with verifiable water that you can easily sponge out.
 - Boat with unverifiable water in a single ballast tank.
 - A canoe with an electric motor.
 - A cabin cruiser that has an inboard engine.
10. When should you ask about live aquatic bait?
- Only when the boater does not have a green seal.
 - Only when you see fishing poles on the boat entering the reservoir.
 - Every time a boater enters or leaves your location, even when they have a green seal attached.
 - Never. Checking for live aquatic bait is not part of the inspection process.
11. Boats with unverifiable water (ballast, I/O, inboards) are required to get a standing water decontamination if they do not have a valid seal and white receipt from a negative reservoir and are launching in a different water body next. True or False
12. What should you do if you suspect you have a mussel boat? (circle all that apply)
- Report
 - Document
 - Collect
 - Decontaminate
 - Panic

13. Name the three roles of the inspector and decontaminators:
1. _____
 2. _____
 3. _____
14. Colorado Parks and Wildlife staff trains boat inspectors and decontaminators (a.k.a. Authorized Agents). It is the job of the Agents to train whom?
- a. Boaters
 - b. Anglers
 - c. Members of the Public
 - d. All of the Above
15. How long are bait receipts from Colorado authorized dealers valid for?
- a. 3 days
 - b. 5 days
 - c. 7 days
 - d. 10 days
16. What are the names for the two types of water found on boats?
- a. Fresh water and salt water
 - b. Distilled water and spring water
 - c. Dirty water and clean water
 - d. Verifiable water and unverifiable water
17. Use or possession of live fish as bait is allowed West of the continental divide except at Navajo Reservoir.
True or False
18. Which of the following watercraft are considered “High Risk”? (Select All That Apply)
- a. A boat that DOES NOT have a matching seal and receipt.
 - b. A boat with a seal that is not green.
 - c. A boat with a green seal and a blue receipt from a location with ANS not present at your WID station.
 - d. A boat with a green seal from Colorado and white receipt.

Outdoor Demonstration—Exit Inspection

What Did You Observe?

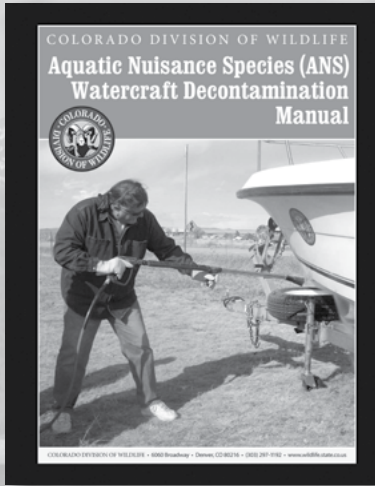
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____



Chapter 6 Watercraft Decontamination Procedures



Content updated from the *CDOW Aquatic Nuisance Species (ANS) Watercraft Decontamination Manual, 2011*



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cpw.state.co.us

Why watercraft decontamination?

Invasive species, such as zebra or quagga mussels, are able to travel great distances over land by “hitchhiking” on watercraft. They can survive up to 30 days out of water depending on temperature or humidity. Through a comprehensive education, inspection, and decontamination program, we can stop the spread of these costly invasives in the West. Once detected on watercraft, zebra or quagga mussels and other aquatic nuisance species (ANS) can safely and effectively be killed and removed from the watercraft by certified personnel. The Western Regional Panel, and most western states, follow the Uniform Minimum Protocols and Standards (UMPS III), which requires the use of hot water with high or low pressure to decontaminate boats, motors and engines, trailers, personal gear, and other equipment. The objective of decontamination is to **kill** and **remove**, to the extent practical, all mussels or suspected ANS. Killing ANS prevents establishment of new populations as a result of watercraft and equipment transfer.

When will decontamination be required?

Most inspections will not result in a decontamination being performed. However, there are numerous circumstances that will result in a decontamination being performed:

- If zebra or quagga mussels are found attached to a watercraft.
- If any other ANS is positively identified or suspected on a watercraft.
- If suspect unidentifiable bumps are detected on a watercraft.
- If the watercraft is from a suspect, positive, or infested water and has any water in it and has not been decontaminated.
- If the watercraft has unverifiable water (e.g. ballast tank, inboard or inboard/outboard engine) and does not have a seal and receipt, was last used out of state, or has an ANS not present at your waterbody.
- If the watercraft or trailer has plants attached that can't be removed by hand.
- If the watercraft has live aquatic bait without a valid receipt.
- If the inspector deems a decontamination is necessary.

What does watercraft decontamination generally consist of?

Watercraft decontamination consists of a very hot water rinse or spray at high or low pressure. There are no soaps, bleaches, or chemicals used or recommended at this time. The hot water kills the mussels and other ANS, and the high pressure spray removes them from the watercraft.

The protocol is to use 140°F water at high pressure (3,000 psi) to decontaminate the hull and 140°F water at low pressure to decontaminate motors/engines. Interior compartments are decontaminated with 120°F at low pressure.

Figure 1 tells us that a 140°F (60°C) hot water rinse for ten seconds will kill all adult mussels. A 176°F (80°C) rinse for five seconds will kill all adult mussels. Higher temperatures are not recommended for the protection of the watercraft.

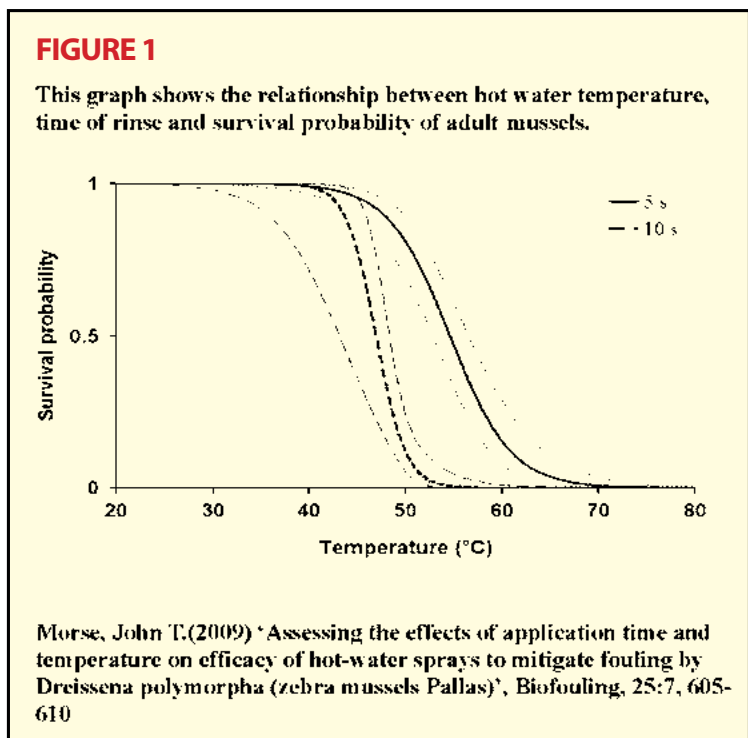
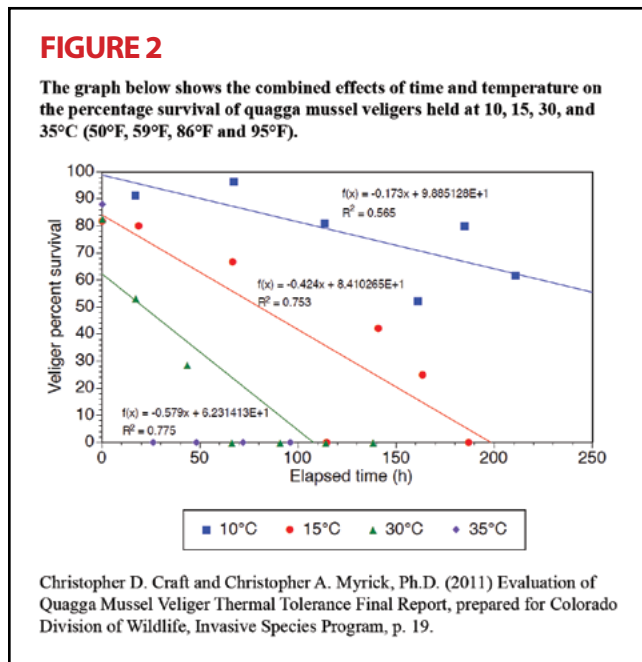


Figure 2 shows that there was 0% survival of quagga mussel veligers in water temperatures of 95°F (35°C). Therefore, the reduced temperature of 120°F for interior compartment standing water decontaminations for the protection of the watercraft is more than sufficient to kill veligers in those interior compartments. This research reinforces the importance of standing water decontaminations for boats leaving listed waters, even if no adults or settlers

are found on the vessel, because it proved that veligers can live in standing water for up to 24 days at 50°F (10°C), 8.5 days at 59°F (15°C) or 4.5 days at 86°F (30°C).



What are the different types of decontamination?

There are four different types of watercraft decontaminations. Each of these will be described in greater detail later in the chapter.

Standing Water Decontamination

This protocol is performed to kill veligers or other ANS in standing water that can't be fully drained from the watercraft. This type of decontamination applies to interior compartments that contain water or have equipment that has come in contact with the water body. The interior compartments include but are not limited to: live wells, bait wells, bilge areas, anchor lockers, equipment storage, sea strainers, and ballast tanks. Equipment includes but is not limited to: anchor, mooring and anchor lines, PFD's, swim platform, inflatables, down-riggers planning boards, water skis, wake boards, ropes, ice chests (used for bait or for holding fish), fishing gear, drift socks, bait buckets, and stringers. Standing water decontamination also includes flushing the outboard motor, I/O engine, or inboard engine of a watercraft.

Standing water decontamination is required if the:

- Watercraft did not get a decontamination when leaving a suspect, positive, or infested water body and has ANY water in it.
- Watercraft has unverifiable water (ballast, I/O or inboard engines) and does NOT have a valid seal and receipt, was last used out of state, or has an ANS not present at your waterbody.
- If the watercraft is unable to be fully drained and the water can't be sponged, towed or pumped out.

The standing water decontamination protocol requires that pump temperature ratings are taken into account when flushing or rinsing a compartment for standing water. Some, but not all, marine pumps are rated to withstand temperatures above 140°F. If the pump is rated to a lower temperature and is flushed with 140°F water, damage could occur. For this reason, the protocol requires applying 120°F in all interior compartment flushes or standing water decontaminations. Standing water decontaminations of engines are performed at 140°F at low pressure.

Plant Decontamination

This decontamination is performed whenever plant material cannot be removed from the watercraft or trailer by hand. The hot water application is localized and requires using 140°F hot water for 15 seconds directly on the plant material. If plants are found on the exterior of the boat, interior compartments, like ballasts, may be subject to decontamination.

Bait Treatment

This decontamination prevents the transfer of ANS being used as bait and for contaminants in standing water in a bait well or bucket. Strict step-by-step procedures must be followed if the bait receipt is older than seven days. If the bait is from out of state, or the bait is not permitted, the bait should be disposed of in the trash. If the boater has no receipt, and the bait is allowed, follow the bait treatment procedure found later in this book.

Full Decontamination for Suspected or Known Zebra and Quagga Mussels

This protocol is performed when adult or settler mussels, unidentifiable bumps, or other ANS are detected on the watercraft. This decontamination is the most complicated of the four types and ensures that the boat has been completely decontaminated inside and out. The inspector must take photos and samples for identification prior to doing a full decontamination.

In rare instances, you may require the assistance of law enforcement personnel to decontaminate or impound a boat. A few of these situations that would require a qualified peace officer to assist include; an uncooperative boat owner, an unavailable or broken decontamination unit, or instances in which an inspector simply can't get a fully encrusted watercraft decontaminated in one day.

Where should watercraft decontamination stations be located?

Watercraft inspection, draining, and decontamination should be located in the same general area. The location should be far enough from the water or boat ramp that drained bilge/ ballast/well water and water from the decontamination unit cannot flow into the water body. WID Stations are ideally on an access road where all boats must pass prior to launch and after exiting the boat ramp. The station should be far enough away from the ramp to allow users, especially overnight campers, to move through the interior of the property or park without going through the inspection and decontamination station unnecessarily.

Decontaminations should be conducted “high and dry,” away from the water. The minimum requirements for decontamination unit placement include:

- Must be in a location where the water does not run off into the reservoir or lake.
- Must be on semi-permeable surface (gravel or dirt) where water absorbs into the ground or evaporates off, or have proper drainage so that runoff can not go into the reservoir or lake.
- Must be in a location where the inspector can maintain visual and auditory contact with the inspection station (which in many instances is the boat ramp but not always).
- Must be in a secure facility where the decontamination unit is locked up over night or when inspectors are not present.
- Must be protected from the elements—rain, wind, excessive cold.
- Must be in compliance with all waste water disposal requirements in local and state laws and regulations.

When should a portable water containment pad be used?

If a suitable site (high and dry, away from the water source, and on a semi-permeable surface) is not available, or you are using a large enough amount of water that it is not absorbing into the ground and is ponding, you will be required to use a water containment pad to ensure waste water is collected and properly disposed of.



What are the requirements for a decontamination unit?

- The unit needs to have an adjustable thermostat that is able to be set at 120–140°F and maintain a constant temperature without fluctuation greater than 2 degrees.
- Minimum flow of five gallons per minute.
- Preferred pressure of 3,000 psi. (minimum 2,500—maximum 3,500)



On-Demand Decontamination System Standard Operating Procedures

Preparation

1—Check the propane level by looking at the gauge on top of the propane tank .



2—Check that propane supply valve is in the open position.



3—Connect the hot water hose to the hot water outlet. Roll out the hose and double check all connections.

4—Connect the cold water supply from water source (hydrant/tank) to cold water inlet and turn the water on.

Operation

1—Purge the air from the system. Push the lever on the flow control valve away from you to activate the water. Allow the water to run until a constant stream of water comes out. Pull the handle towards you to stop.



2—Set your desired temperature. Using the keypad, press the On/Off button to turn the system on. Use the up/down arrows to select your desired water temperature.

Be sure to test the water temperature prior to decontaminating to ensure you are working at the appropriate temperature for the decontamination procedure.

Note: You must stop the flow of water in order to adjust the temperature on the keypad during use.

3—Perform decontamination. Attach the appropriate decontamination tool to the flow control valve and perform the decontamination following the protocol for that appropriate decontamination procedure.

Shut Down

1—Using the keypad, press the on/off button to turn the system off.

- If using a Goal Zero solar system, press the “AC” button on the battery box until the green light goes out. This turns off heater panels. Press the same button to turn on heater panels for the next decon.

2—Turn the water supply off.

3—Open the flow control valve and allow residual water to drain from the system.

4—Disconnect decontamination tools and store properly.

5—Disconnect all hoses and drain any remaining water. Store properly.

6—Ensure all spigots remain in the open position to allow residual water to drain from the system.

What are the standard operating procedures for a decontamination unit?

Be sure to follow the manufacturer's operating procedures specific to your unit.

Step-by-Step Operating Instructions for Trailered Hydro Tek Decontamination Units

Before start up

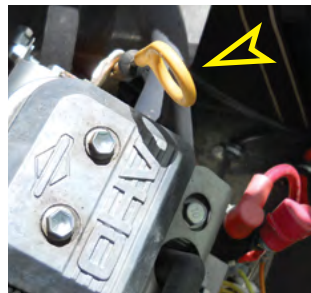
1—Check pump oil. Check pump oil by locating the yellow oil dip stick on top of the pump. ➔



2—Check fluid levels. Check engine oil by locating the yellow dip stick on the engine. Check the gasoline and diesel fuel levels in the tank. ➔



3—Roll out the hose all the way and double check all quick connects. ➔



4—Connect the water supply and turn water on. Maintain an adequate supply of water using a 3/4 inch I.D. hose with a pressure between 25 and 60 psi. Burner power switches should be off before starting. If the decontamination unit is tank fed, be sure there is water in the tank and the valve is switched for supply tank feed. **Do not run dry.**

Operation

1—Starting. Pull out choke and turn the key to start position only until engine starts. Push the choke in immediately after engine starts. ➔



2—Purge air from system. Squeeze the trigger on the spray gun until a constant stream of water comes out.

3—Select desired nozzle. Connect a 40° nozzle securely to the spray wand. Hold the gun firmly, squeeze the trigger for high-pressure spray. ➔

CAUTION: gun kicks back—hold with both hands.



Step-by-Step Operating Instructions for Trailered Hydro Tek Decontamination Units (cont.)

4—**Start the burner.** To create hot water on high pressure washers equipped with heat exchangers, release the trigger on the gun, turn the burner to the “on” position, and turn the thermostat to the desired temperature.

Squeeze the trigger on the spray gun and the burner will begin heating the water. The burner will stop heating the water whenever the water spray is off or if the temperature setting is exceeded.

Be sure to test the water temperature prior to decontaminating to ensure you are working at the correct temperature for that procedure (either 140°F or 120°F).

5—**Bypass mode.** System will go into bypass mode when the machine is left running and the trigger gun is released. Bypass mode is when the inlet water coming into the pump re-circulates through the unloader across the pump head. If left in bypass too long—more than one minute—friction created by the movement of the water will begin to heat the water at a rapid rate. If equipped with a bulk water tank, water can be bypassed back through the tank allowing for a larger volume of water to be re-circulated through the pump head, thus reducing heat on the pump seals.

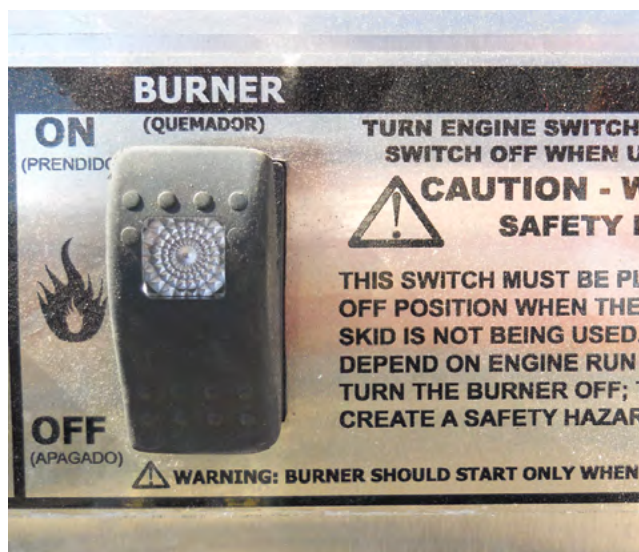
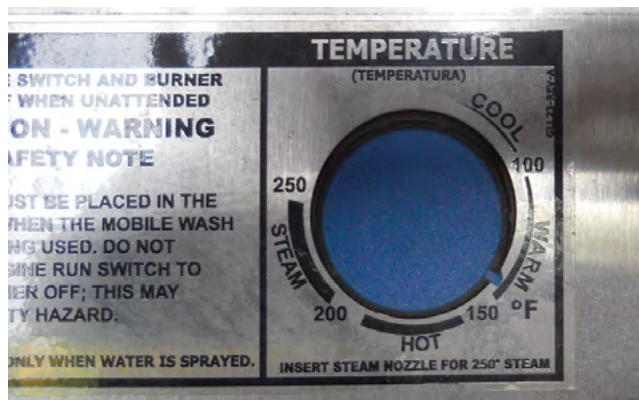
WARNING: Do not leave in bypass for longer than one minute to prevent the pump from overheating. Shut off the unit when not spraying water.

6—**Perform appropriate decontamination protocol.**

Shut down

WARNING: Cool down the burner before shutting off the decontamination unit.

- 1—Turn the burner switch to the off position.
- 2—Squeeze the trigger on the spray gun until the water becomes cool.
- 3—Turn the engine switch off.
- 4—Turn off water supply.
- 5—Squeeze the trigger to release any trapped pressure in discharge hose.
- 6—Drain water out of the hose and roll up.
- 7—Disconnect attachments and store properly.



What is included in the standard decontamination protocol?

To ensure that zebra and quagga mussels and other ANS are killed and removed, watercraft decontamination protocols include:

Safety!

Keep staff and the public safe by wearing all personal protective equipment including a heat resistant suit, taking care to avoid slips, trips, falls, and burns. Use caution when operating the high pressure spray wand.



Education

Explain to the boater why decontamination is important and why we are doing it. You can direct them to the *Boaters Guide to ANS Inspections* brochure and have them read it in a safe location while you perform the decontamination.

Removal

All mud, plants, water, and organisms must be removed from the vessel.



Decontamination

Thoroughly flush the interior compartments and spray the exterior of the watercraft with hot water.

- All discharge ports or through hull fittings must be flushed with **120°F** water at **low pressure** for 130 seconds (2 minutes, 10 seconds) or until the water back flushes.
- All interior compartments that may hold water, including, but not limited to: live/bait wells, ballast, bilge areas and intakes must be flushed at **low pressure** with **120°F** water.
- If a bilge pump is present, then it must be run until the bilge appears to be empty.
- The lower unit of the engine should be thoroughly flushed with **140°F** water at **low pressure** until exiting water temperature is 140°F.
 - The gimbal area must be sprayed with **low pressure 140°F** water for 130 seconds (2 minutes, 10 seconds).
 - The exterior of the watercraft and trailer must be thoroughly decontaminated with **140°F** water with **low and high pressure**.



When doing a full decontamination for suspect or known ANS, be sure to fill out all required paperwork, take photos before and after decontamination, collect samples, and do a thorough inspection both before and after the decontamination.

Bait

Depending on the location and type of live aquatic bait, the inspection or treatment will vary. See the bait treatment section on page 109.

Report

Report a mussel boat to your supervisor. Inspectors must report all suspect mussel boats and/or full decontaminations to the CPW ANS Program office immediately. Inspectors must also fill out the full decontamination workflow in the data collectors and submit that record electronically at the time of interception and/or decontamination. Photos must be emailed and samples mailed with paperwork to the CPW ANS Lab within 48 hours.



Colorado Parks and Wildlife
Aquatic Nuisance Species Lab
6060 Broadway, Denver, CO 80216
Email: Invasive.Species@state.co.us
Phone: 303-291-7295

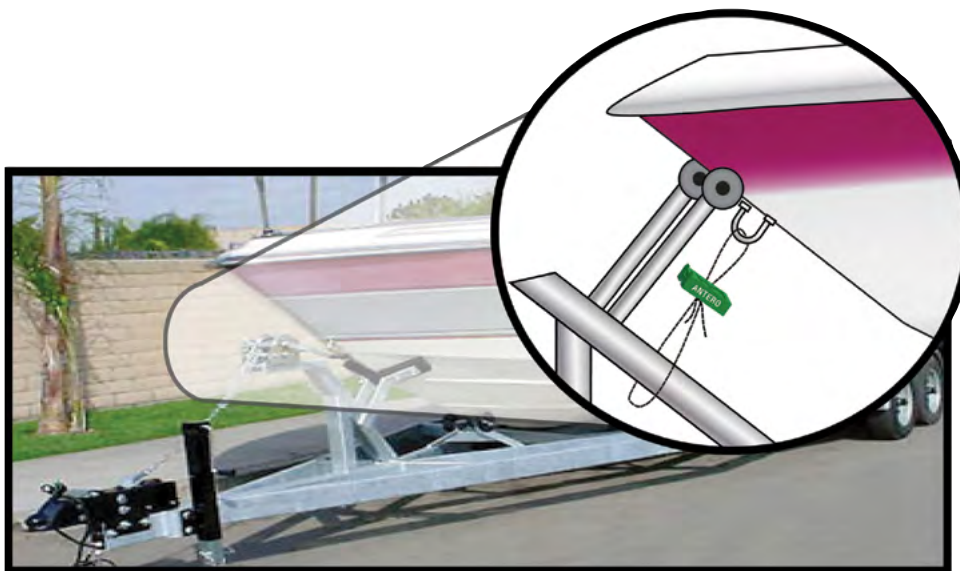
All other decontaminations are documented in the Data Collectors or the Activity Log.

Seals and Receipts

If the boat is leaving your site following any decontamination, apply a green seal and give the boat operator a seal receipt. Write in notes section if anything wasn't working—for example, if a flush wasn't done because the engine battery was dead.

What is the protocol for standing water decontaminations?

Zebra and quagga mussels start off life as microscopic, free-floating organisms called veligers that are too small to see with the naked eye. They can be transported to new locations in standing water in live wells, bilge areas, and other interior compartments on boats. Mussels aren't the only unseen invasive species. Others, such as the waterflea, are also microscopic and transported in water from the lake or reservoir. Small plant fragments that get sucked up in water onto the boat could start a new infestation in another lake. To prevent the overland movement of all invasive species through standing water on





boats, the lake or reservoir water must be fully drained out of the boat in between each use. If the standing water cannot be fully drained, the compartment needs to be decontaminated.

This protocol is used to force infested water out of the boat while killing veligers and other ANS in the water. The water must reach 120°F coming out of the boat for interior compartments, or 140°F for engines and motors. Exit temperature for ballasts discharged is 105°F to allow for ‘marination’ time. The high pressure wand is never used in this protocol.

If boats have been drained to the fullest extent possible and still contain standing water in the bilge, ballast tanks, live/bait wells, or engines, then you will need to follow the rules below to determine if decontamination is required.

- A boat from suspect, positive or infested water that was not decontaminated upon exit and has **ANY** standing water present, must be decontaminated. This includes water in ballast tanks, inboards, and I/O engines.
- For an undocumented boat (no seal and receipt) with unverifiable water (ballast tanks, inboards and I/O engines), a standing water decontamination is required.
- Colorado protocol requires that watercraft must be clean, drained and dry before it is allowed to launch into waters of the state. If a boat has small amounts of standing water and the boat has **not** been in suspect, positive or infested waters, inspectors must still remove the water from the boat. The inspector should have a small pump and sponges/towels available at the inspection station to assist with the draining of boats. If using these tools does not ensure a fully drained vessel (e.g. gravity emptied live wells with long discharge hoses) then the interior compartments with water remaining should be flushed with 120°F water.

Be extremely cautious with OUT OF STATE BOATS because some other states do not have extensive sampling programs focused on early detection. We do not know which lakes are or are not infested in those states. If a watercraft from out of state has any standing water that can't be removed (e.g. unverifiable water) it must get a minimum of a standing water decontamination.

Interior compartments that may hold water, including, but not limited to live/bait wells, ballast, anchor compartments, bilge areas and their corresponding intake ports, must be flushed with 120°F water at **low pressure**. This can be accomplished by using the diffuser attachment.

Due to research findings about ballast, bilge, and live/bait well pumps it is important to adjust the temperature of the decontamination unit to 120°F to ensure that no damage is done to the pump during the decontamination process.

Note: *Prior to decontaminating interior compartments with pumps, be sure that you have tested the temperature of the water to ensure that your unit is operating at 120°F and verify using a digital thermometer that the water reaches 120°F exiting the boat. Engines and motors are flushed using 140°F low pressure hot water.*

What are pump temperature ratings?

Pump manufacturers were consulted during the drafting of these procedures. In rare occasions, marine transfer pumps could be damaged by the use of hot water temperatures during the decontamination process. The following is a list of some popular manufacturers, pump types and their recommended temperature ratings. Due to the complexity of pumps and the various brands and ratings, it is required that interior compartments are decontaminated at 120°F with low pressure.

Pump Temperature Rating Table	
Manufacturer	Temperature Rating
Atwood Corporation	130°F
Johnson Pumps of America	170°F
SHURflo Pumps	140°F
ITT Manufacturers	120°F

Step-by-Step Procedure for Standing Water Decontaminations

Standing Water Decontamination of Interior Compartments (Not Ballast)

1—Put on all required personal protective equipment.

2—Have the boat operator open all interior compartments that need to be decontaminated.

3—Start the decontamination unit following the standard operating procedures.

4—Turn on the burner and measure the temperature of the water.

5—If equipped with a discharge pump, fill the compartment until the pump is submerged. Make sure to keep the tip of the diffuser close to the sides of the compartment to prevent temperature loss. Have the boater turn on the discharge pump for the compartment and measure the temperature of the water at the through hull discharge port. Once the exit temperature has reached 120°F, have the boater turn off the discharge pump.

6—Remove drain plugs and continue flushing until the exit temperature of the water maintains 120°F.

7—Allow the compartment to drain.

8—Turn off the decontamination unit when you have completed decontaminating all necessary interior compartments. Turn the burner off first, run water through the boiler and then turn off the decontamination unit. Follow the standard operating procedures for shutting down your decontamination unit.

9—In your data collector, indicate “Standing Water Decontamination” under the “Results” section. Indicate which components were decontaminated.

10—If exiting, apply a seal and give the boater a properly filled out receipt. Remind the boater to clean, drain, and dry.



Standing Water Decontamination of Outboard Motors and Inboard/Outboard Engines



Outboard Motor



Inboard/Outboard Engine



All decontamination stations should have at least two models of decontamination mufflers; a type for the newer Mercury engines that threads through the intake ports that are completely open; and another clamp style muffler for all other engines. ➤



1—Attach the whip hose to the end of the trigger and attach the mufflers to the whip hose. ➤



2—Make sure the motor/engine is completely lowered. Place the mufflers so that all the intake openings are completely covered. ➤



3—Put on all required personal protective equipment.

4—Start the decontamination unit following the standard operating procedures.

5—Start the water by engaging the trigger. Check to make sure the intake openings are still covered on both sides and that the mufflers are tight.

Step-by-Step Procedure for Standing Water Decontaminations (cont.)

6—Stand clear of the propeller and have the boat operator start the motor/engine in **Neutral**.

Note: If operating in colder climates, allow the engine to warm up by running water through prior to starting the burner.

Note: If the engine is not uptaking water when it is turned on in neutral, turn off the boat engine, release the trigger, and re-adjust the muffs.



7—Start the burner and flush the engine until the water temperature maintains 140°F when measured by a thermometer at the discharge port(s).

8—Have the boat operator turn off the motor/engine.

9—Remove the muffs and allow the motor/engine to drain; have the boat operator raise the engine.

10—Turn off the decontamination unit by turning the burner off first, run some water through the boiler and then turn off the decontamination unit. Follow standard operating procedures for shutting down your decontamination unit.

11—In your data collector, indicate “Standing Water Decontamination” under the “Results” section. Indicate which components were decontaminated.

12—If exiting, apply a seal and give the boater a properly filled out receipt. Remind the boater to clean, drain and dry.

Note: Do not utilize salt water flush ports on outboard engines for decontamination.

Note: Some complex marine propulsion systems require specialized equipment and procedures to be decontaminated. Please consult with your supervisor if you are uncertain.



Standing Water Decontamination of Inboard Engines

Note: Most inboards, but not all, that have the engine in the center of the boat do not have ballast tanks.



All inboard intakes, which are located on the bottom of the hull directly under the engine, have a cover over the opening that protects the engine from sucking up large particulates.



1—Attach the whip hose to the gun and then attach the fake-a-lake.



2—The fake-a-lake must be placed securely against the bottom of the hull covering the intake port for the inboard



Step-by-Step Procedure for Standing Water Decontaminations (cont.)

3—Put on all required personal protective equipment.

4—Start the decontamination unit following the standard operating procedures.

5—Start the water by engaging the trigger. Visually confirm the fake-a-lake did not shift.

6—Stand clear of the propeller and have the boat operator start the engine in **Neutral**.

Note: If operating in colder climates, allow the engine to warm up by running water through prior to starting the burner.

Note: If the engine is not uptaking water when it is turned on in neutral, turn off the boat engine, release the trigger, and re-adjust the fake-a-lake.

7—Start the burner and flush the engine until the water temperature maintains 140°F when measured by a thermometer at the discharge port(s).

8—Have the boat operator turn off the engine.

9—Remove the fake-a-lake from under the boat.

10—Turn off the decontamination unit by turning the burner off first, run some water through the boiler and then turn off the decontamination unit. Follow standard operating procedures for shutting down your decontamination unit.

11—In your data collector, indicate “Standing Water Decontamination” under the “Results” section. Indicate which components were decontaminated.

12—If exiting, apply a seal and give the boater a properly filled out receipt. Remind the boater to clean, drain and dry.

Note: Some inboard engines are equipped with flushing ports. Consult your supervisor before utilizing these flushing ports.


Note: Some complex marine propulsion systems require specialized equipment and procedures to be decontaminated. Please consult with your supervisor if you are uncertain.

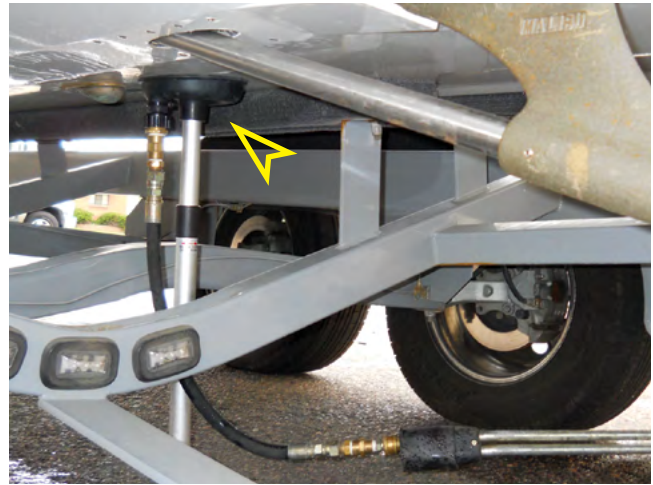



Standing Water Decontamination of Ballast Tanks and Bags

Note: Most inboards, but not all, that have the engine in the center of the boat do not have ballast tanks.



- 1—Attach the whip hose to the end of the wand and then attach the fake-a-lake.
- 2—Put on all required personal protective equipment.
- 3—Request that the boater discharge all water from the ballast system.
- 4—Identify which ballast intakes go to which ballast tanks/bags prior to initiating decontamination.
- 5—The fake-a-lake must be placed securely against the bottom of the hull covering the intake port for the ballast tank/bag. 
- 6—Start the decontamination unit following the standard operating procedures.



- 7—Start the water by engaging the trigger. Visually confirm the fake-a-lake did not shift.
- 8—Start the burner and have the boat operator turn on the corresponding intake ballast pump. Fill up the ballast tank/bag until the gauge at the helm reads a minimum of 25% utilizing 120°F. If there are no gauges, allow the tank to fill for a minimum of 3 minutes. 

Note: If the ballast pump is not uptaking water when it is turned on, turn off the pump, release the trigger, and re-adjust the fake-a-lake. If this does not resolve the issue, consult with your supervisor.



Step-by-Step Procedure for Standing Water Decontaminations (cont.)

9—Have the boat operator turn off the intake ballast pump. Release the trigger to stop the water flow. Allow the water to rest (marinate) for a minimum of 3 minutes.

10—Have the boat operator discharge the water. If the discharge water is 105°F or greater this bag/tank is complete. Have the operator continue to run the discharge pump to drain the tank as much as possible. If conditions are not met drain bag/tank and repeat steps 8–10.

11—Repeat this process for **EACH** ballast tank/bag. Ensure each tank/bag has been exposed to 120°F water. ➔

12—In your data collector, be sure to mark “Standing Water Decontamination” under the “Results” section. Indicate which components were decontaminated.

13—If exiting, apply a seal and give the boater a properly filled out receipt. Remind the boater to clean, drain, & dry. ➔

Note: Some complex ballast systems require specialized equipment & procedures to be decontaminated. Please consult with your supervisor if you are uncertain of how to perform the decontamination.



State of Colorado
INSPECTION AND DECONTAMINATION SEAL RECEIPT
For use when applying green seals to boats at Negative Prevention locations. Provide original to watercraft owner (white) and keep carbon copy (yellow).

WID Location: <u>Mc Phee</u>	
Date: <u>7/17/22</u>	Time: <u>10:30am</u>
Inspector's ID #: <u>1147</u>	Boat Type: _____
Vessel Registration (CL #): <u>CL 2876 LU</u>	
Trailer Plate #: <u>122-ANS</u>	Seal Serial #: <u>6325173</u>

PROCEDURES PERFORMED (Every line must be checked to be valid)			
Exit (HEAD) Inspection:	<input checked="" type="checkbox"/> Performed	or	<input type="checkbox"/> Not Performed
Standing Water Decontamination:	<input checked="" type="checkbox"/> Performed	or	<input type="checkbox"/> Not Performed
Full Decontamination:	<input type="checkbox"/> Performed	or	<input checked="" type="checkbox"/> Not Performed
Plant Decontamination:	<input type="checkbox"/> Performed	or	<input checked="" type="checkbox"/> Not Performed
Bait Decontamination:	<input type="checkbox"/> Performed	or	<input checked="" type="checkbox"/> Not Performed

HOW TO TREAT A BOAT WITH A GREEN SEAL

Always ask about live aquatic bait and follow bait protocol. Cut off seal and set boat launch if one of the following are true:

- 1.) Boat is returning to the same location; or
- 2.) Boat has been decontaminated; or
- 3.) Boat is clean and fully drained.

If not, perform an inspection prior to launch.

NOTES:

Ballast tanks only

CLEAN, DRAINED, AND DRY BOATS GET ON THE WATER FAST!

Distribution: White—Owner/Operator Yellow—Inspection Location
1-3/2022—88,000 RW3-15/22830-22

What is the protocol for plant decontamination?

True aquatic plants are defined as plants that are normally completely or mostly submerged in water and are unable to survive for long periods outside of water. Submerged aquatic weeds are commonly transported via watercraft and trailers, usually by getting tangled around motors, engines, and anchors. Most aquatic weeds can establish new populations with only a tiny fragment of the parent plant. Those tiny fragments can be carried overland on watercraft, trailers, anchors, fishing equipment, water ski equipment, etc. It is the inspector and the operator's responsibility to ensure plants are not transported on boats.

During the entrance and exit inspection, any plant or plant fragment should be hand removed and properly disposed of away from the lake or reservoir by the inspector or boat operator. However, there may be a situation when plant material is caught between the hull of the vessel and the trailer bunk or roller, or is wrapped around the propeller or transducer, and can't be completely removed by hand. ➔

It is mandatory for the boat inspector to decontaminate those areas of the vessel where the plant fragments remain. **Remember**—heat kills.

Step-by-Step Procedure for Plant Decontamination

Note: Research is not conclusive on the effectiveness of killing all plant species and therefore these procedures are based on best available information.

- 1—Remove as much plant material as possible and dispose of properly prior to starting decontamination.
- 2—Attach the low pressure attachment/diffuser to the trigger.
- 3—Put on all required personal protective equipment.
- 4—Start the decontamination unit following the standard operating procedures.
- 5—Decontaminate areas where plants are located and can't be removed by hand.
 - **Exterior Components.** Apply low pressure 140°F water directly to each plant or plant fragment for a minimum of 15 seconds.
 - Trailer considerations
 1. *Carpeted Bunks (Areas That Can't Be Seen).* Move the diffuser slow along the length of the bunk. Keep the tip of the diffuser close to the bunk to maintain an even temperature and complete saturation. ➔



State ANS Regulation #803H prohibits the movement of watercraft overland with aquatic plants attached.

“Upon removal of a vessel or other floating device from waters of the state, and before leaving the boat launch or parking area, the operator is required to remove aquatic plants and water drain plug(s). It is prohibited to transport a vessel or other floating device over land with aquatic plants or water drain plugs in place.”




© MICHIGAN SEA GRANT

If plant material is found on a boat with ballast tanks, the tanks must be flushed to eliminate possible fragments within.



Step-by-Step Procedure for Plant Decontamination (cont.)

2. *Rollers.* If plants are found on any rollers use the diffuser to saturate each roller as there may be plant fragments present that can't be seen. 

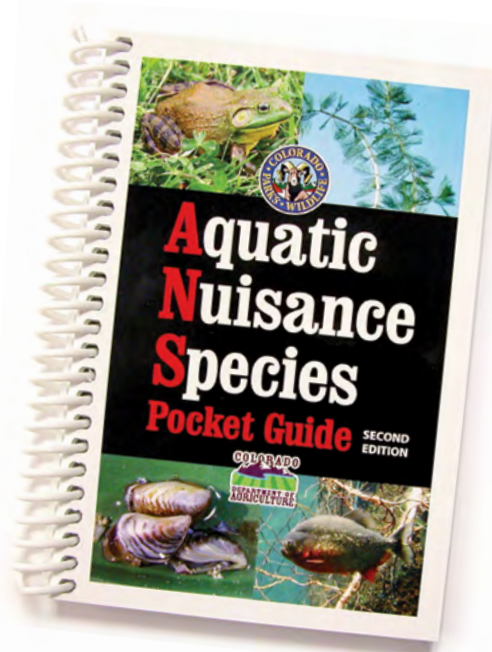
• Interior Compartments.

1. Have the boater remove any screens or plugs for through hull fittings that may be present.
2. Flush the entire system from the point of water intake to point of discharge using 120°F degree water for a minimum of 30 seconds.
 - If the system is one directional, allow intake to pump for duration of decontamination.
 - If the system is bi-directional, re-inspect for additional plant fragment and then discharge.
3. If a compartment does not have an intake, clean out any equipment, flush the compartment using 120°F degree water for a minimum of 30 seconds and drain.
4. Have the boater re-install any screens that have been removed.
5. Remind the boater to reinstall plug(s) prior to launch. The boater is responsible to ensure the watercraft is watertight before launching.

6—Turn off the decontamination unit when you have completed decontaminating all necessary vegetation. Turn the burner off first, run some water through the boiler and then turn off the decontamination unit. Follow the standard operating procedures for shutting down your decontamination unit.

7—In your data collector, be sure to mark “Plant Decontamination” under the “Results” section. Indicate which components were decontaminated.

8—If exiting, apply a seal and give the boater a properly filled out receipt. Remind the boater to clean, drain, & dry.



Note: If a boat from a reservoir/lake that is not known to be positive for that plant species (Eurasian watermilfoil for example) comes to your station and has plant material that you believe is an ANS, please take a sample following the protocol on the page 4 (ANS) Documentation and Vessel Decontamination Form: Specimen Collection and Shipping Instructions (see page 112 of this book).

Send plant samples to:


Colorado Parks and Wildlife
Aquatic Nuisance Species Lab
6060 Broadway, Denver, CO 80216
Email: Invasive.Species@state.co.us
Phone: 303-291-7295

Remove all plant material and dispose of it in the trash. If a complete removal is not possible, decontaminate the sections of the watercraft that are affected.


Step-by-Step Protocol for Bait Treatment

As much as possible, **minimize transferring water to the holding container.** The live/bait well or container must be drained and decontaminated using 120°F low pressure water before the bait is restocked in the container that has been re-filled with water from the lake the boat will be entering. If a decontamination unit is unavailable or not working properly, completely dry out the original container using a paper towel or cloth. If exiting, do not allow water from any reservoir, especially a containment reservoir, to leave in a bait bucket or live well.



1—Using a net, transfer the bait to a holding container filled with reservoir water. Minimize the transfer of water from the original container as much as possible. 




2—Drain the original container or compartment (e.g. live well). 



3—Follow standard operating procedures for your decontamination unit.

- Check all fluid levels of the decontamination unit. With the trigger squeezed, start the unit and purge the water until it runs clear. Turn on the burner, and measure the temperature of the water.

4—Flush the live/bait well, compartment or container with low pressure until the exit temperature of the water reaches 120°F. Be sure to keep the tip of the attachment close to the sides of the compartment to prevent temperature loss. If using the wand, be sure to **remove the nozzle** so that you are using low pressure. 


- If there is a discharge pump for the live/bait well, you can use a thermometer and measure the temperature exiting the through hull discharge port for that compartment.



Step-by-Step Protocol for Bait Treatment (cont.)

5—Follow standard operating procedures for shutting down your decontamination unit.

- Turn off the decontamination unit; turn the burner off first, run some water through the boiler and then turn off the key.

6—Whenever possible, water from the reservoir the boat is entering should be used for restocking the bait. Do not use tap water, as chlorinated water can kill live aquatic bait. 

7—If exiting, the container or well water will be replaced with water from a sealed container or non-chlorinated source. Do not allow water from any reservoir, especially a containment reservoir, to leave in a bait bucket or live well.



8—Decontaminate all nets, buckets and equipment used with low pressure 120°F water at the end of the procedure.

9—Submit a completed electronic record in the Data Collector or on the paper Activity Log.

Full Decontamination for Suspect or Known Zebra or Quagga Mussels



If you suspect that you have found mussels or another ANS, or you know you have a mussel boat, the following are the steps that you must perform to comply with Colorado State protocol. Even if only one single adult mussel shell is found, the watercraft must get a full decontamination according to this protocol. Any evidence or suspicion of adult or juvenile mussels requires a full decontamination.

Remember it is required that you **document, report, collect, and decontaminate**. Follow these documentation and reporting procedures and do not allow the boater to leave with mussels or other ANS attached to the boat.



If a watercraft is highly encrusted with zebra or quagga mussels, it can be quite difficult to effectively remove all the mussels from the watercraft. It can take several days for the dead mussels' byssal threads to detach and for gravity to

pull them out of the watercraft. Always try to remove all mussels from the watercraft prior to releasing it. If a boat is too highly infested to fully remove mussels at the inspection station, make arrangements for the boat to be serviced at a certified marina or marine business prior to releasing it. If the boat owner is not cooperative, you will need the assistance of law enforcement to quarantine or impound the watercraft or escort it to a certified marina or marine business to ensure all mussels are dead, removed, and not being transported illegally.

Document

1—Once mussels are found (or suspect mussels or other invasive aquatic animals), a full decontamination is required. You should first complete your inspection to determine the extent of the infestation. Be certain to fill out the Data Collector record completely and accurately. Be as detailed as you can and inspect every part of the boat.

2—Necessary information to be gathered for reporting and enforcement:

- Date/time/location
- Vessel registration/name
- Name and contact information for the boat owner and the boat operator (if different)
- Location where the boat became infested suspected species of ANS
- Final destination

CPW ANS Specimen
Intercepted at: _____
Registration #: _____
Inspector #: _____
Collection Date: _____

Recommended information to be gathered:

- Boating history (last 30 Days)
- Name of inspector
- Vessel type, make and model
- Vessel size
- Time in infested water
- Time out of water
- Level of infestation (estimated number, location, dead or alive)
- Attached vs. not attached
- Name of inspector
- Anticipated travel date/travel route/ETA

3—Take digital photos before starting the decontamination. The recommended minimum photos include:

- **Registration number**
- **Trailer/vehicle plate**
- **Wide angle photo of the boat**
- **Rear of the boat** and boats with gimbals (inboard, inboard/ outboard, stern drives, etc.) get good photos of gimbal boots from several angles to document the before and after condition.
- **Locations of each attached mussel** (both far away and close up)—
 - Change your camera setting to close up mode (icon is a flower) and then take close up photos.

- If specimen is a zebra or quagga mussel, try to get a good close up photo of the byssal threads.
- Ensure the suspect ANS is clearly visible before the samples are detached from the boat.
- Place a common object such as a pencil or penny next to the specimen and photograph the combination to show the relative size of the specimen.
- **Damage.** Document existing damage.

Note: Start taking photos at the watercraft registration number and work your way around the boat to end at the same registration number. If available, take a video of the boat while you walk around it. Both video and photos are desired.

4—In the Data Collector, be sure to accurately complete the data record for the full decontamination and submit.

Be sure to document specifically where the boat has launched, along with where it became infested and any waters it has launched in since infestation. If it is not known where it became infested, document all waters the boat visited in the last six months. Record as much information about the boat's history as possible.

Report

1—Report your suspected ANS discovery by following your program's internal procedure. Report should include the information and photographs detailed above to assist with making an informed decision on next steps.

Note: If it's a highly encrusted or highly complex watercraft quarantining, impounding or requiring dry time of the watercraft may be required in addition to on-site decontamination. You may also want to consider sending the boat with an escort to a certified marine business for mechanical intervention. These actions may require the assistance of a law enforcement officer to order the quarantine or escort the watercraft to the dealer.

2—Communicate decontamination expectations and potential outcomes to boater based on direction received from the proper authority.

Full Decontamination for Suspect or Known Zebra or Quagga Mussels (cont.)

Collect

After reporting and if required, collect several **samples** of the mussels or suspect ANS. If possible, take photos of the sample collection being performed.

Check with your supervisor for the proper procedures for sample collection and where to send the sample for final identification. **An example procedure is listed below for reference.** After the sample is removed, take photos of the infested area.

1—Collect a sample following your program's established procedures. Options include:

- Preservation in alcohol: please only use with plant samples or live mussels. Only fill 50% of the vial with 70% ethanol or grain alcohol, **not rubbing alcohol**. Even trace amounts of chlorine from tap water, or "dechlorinated" tap water can completely destroy sample DNA. Collect as many specimens as will fit in the vial without it overflowing. It is ok to send more than one vial.
- Dry Sample . This is the preferred option. Dead shells do not need to be preserved in alcohol.

2—Write the date, time, location, vessel registration, origin of infestation, and collector's information on the sample label. If there are numerous areas of attachment on the boat, take samples from each of those areas as well. Take photos of the collected sample with a complete label.



Decontaminate

For Decontaminate all parts of the watercraft that have come into contact with the water body by exposing them to hot water at the appropriate temperature and pressure to ensure the ANS are killed and removed. WID stations should have a decontamination unit available. If you do not, and you know you have a mussel boat, call your Supervisor and/or the ANS Program Office for help and try not to allow that boat to leave without decontamination. If needed, ask a law enforcement officer (Wildlife Manager, Park Ranger, Sheriff, etc.) to escort the watercraft to a nearby WID station or to quarantine the vessel until a decontamination unit can be brought to you. Similar to inspection, it is critically important that you perform the full decontaminations in a standardized and repeatable fashion every single time. Use the acronym TIME to help you remember the order of a full decontamination.

Only certified individuals should operate decontamination units.

Personal and public safety should always be top priority. Never allow a member of the public, volunteer, or an untrained employee to decontaminate a boat. Be sure to document all procedures used to decontaminate the boat, including photographs or videos of the decontamination being performed.



Step-by-Step Protocol for Full Decontamination

Once the inspector has documented, reported and collected specimens from the mussel fouled watercraft, it is ready to be decontaminated.

1—Before beginning decontamination, follow the boat owner into the boat. Work with the boater to prepare the interior compartments that need to be decontaminated.

- Remove all equipment from compartments that need to be decontaminated.
- Remove all additional water related equipment that will require decontamination.
- With help of the boat operator, identify the intake and discharge ports for the interior compartments.

2—Assess the level of shells and shell fragments and using a vacuum, broom, tape, or roller remove as much as possible prior to starting decontamination. Encourage boaters to assist with removing mussels to expedite the process.

3—Connect the wand to the trigger to the whip hose.

4—Put on all required personal protective equipment.

5—Start the decontamination unit following the standard operating procedures.

6—Start the water by engaging the trigger. Check the temperature of the water and adjust the temperature depending on the procedure being performed at that time.

Remember the acronym **TIME** to guide you through the procedure. The goal is to decontaminate the entire raw water system from intake to discharge:

7—T = Through Hull Fittings

- Press the diffuser up against the opening of the through hull intake ports and decontaminate each port with 120°F water under low pressure for 130 seconds or until the water back flushes. Have the owner activate any pumps that may be associated with the port.
- Flush all vent and overflow ports with 120°F hot water at low pressure for 130 seconds or until the water back flushes.

Some raw water systems cannot be passively flushed. Refer to Advanced Decontamination Manual for additional information on complex raw water systems such as evaporative coolers, generators, etc.



Step-by-Step Protocol for Full Decontamination (cont.)

8—I = Interior Compartments


Sea Strainers

Sea strainers may be found on any raw water intake. Commonly found areas include generator, inboard engines, evaporative coolers, ballast systems, live wells, waterslides, washdown shower, etc.

- Have the boater remove the sea strainer without removing contents.
- Rinse the strainer basket with 140°F water to remove foreign material.
- Have the boater re-install the sea strainer **filled with** cold water where appropriate.

Note: Ensure the O-ring is properly installed after the boater reinstalls the sea strainer.

Compartments

- Reposition the hose and wand to the forward interior compartment and work from the front to the back of the boat using  low pressure 120°F water to decontaminate every compartment that has standing water or has equipment that has come into contact with the water body.
- If equipped with a discharge pump, fill the compartment until the pump is submerged. Make sure to keep the tip of the diffuser close to the sides of the compartment to prevent temperature loss. Have the boater turn on the discharge pump for the compartment and measure the temperature of the water at the through hull discharge port. Once the exit temperature has reached 120°F continue to fill, allow the pump to run for 130 seconds, and then have the boater turn off the discharge pump.
- Remove drain plugs and continue flushing until the exit temperature of the water maintains 120°F for 130 seconds.
- Allow the compartment to drain.
 - If the boat has an inboard/outboard or inboard engine have the boater raise the lid of the engine compartment and place the wand behind the engine to decontaminate this area.



Equipment

- Soak all wet carpets, anchors, ropes, chains, gear, life jackets, fenders, drift socks, and other equipment that has come into contact with the water with 120°F water at low pressure.
- For carpets and other interior compartments a vacuum may be used.

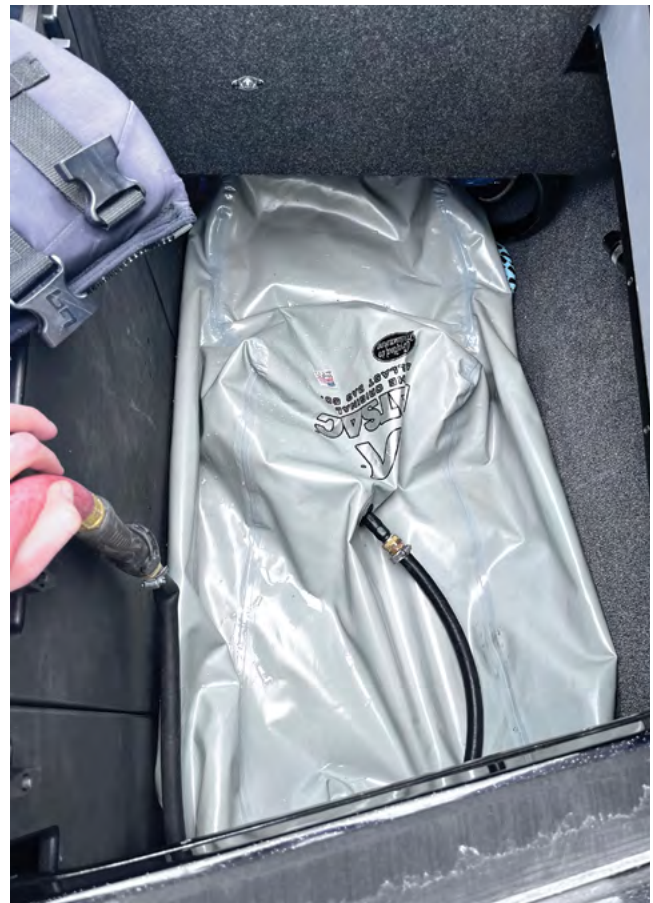
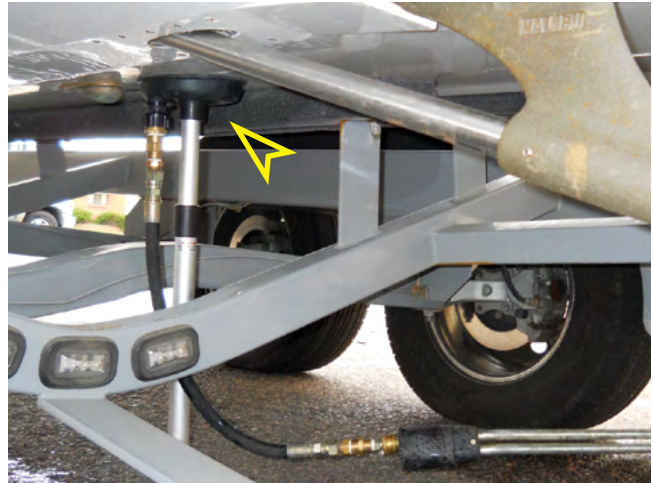
Ballast Systems

- Request that the boater discharge all water from the ballast system.
- Identify which ballast intakes go to which ballast tanks/bags prior to initiating decontamination.
- The fake-a-lake must be placed securely against the bottom of the hull covering the intake port for the ballast tank/bag.
- Start the water by engaging the trigger. Visually confirm the fake-a-lake did not shift.
- Start the burner and have the boat operator turn on the corresponding intake ballast pump.
- Fill up the ballast tank/bag using 120°F. (*It is not yet known if adult zebra or quagga mussels can survive in ballast systems. It is recommended that ballast systems be filled completely where resources allow, otherwise fill the ballast to a minimum 25%. If there are no gauges, allow the tank to fill for a minimum of 3 minutes.)

Note: If the ballast pump is not uptaking water when it is turned on, turn off the pump, release the trigger, and re-adjust the fake-a-lake. If this does not resolve the issue, consult with your supervisor.

- Have the boat operator turn off the intake ballast pump. Release the trigger to stop the water flow. Allow the water to rest (marinate) for a minimum of 3 minutes.
- Have the boat operator discharge the water. Due to the marination time, if the discharge water is 105°F or greater this bag/tank is complete. Have the operator continue to run the discharge pump to drain the tank as much as possible. If conditions are not met drain bag/tank and repeat steps 8–10.
- Repeat this process for EACH ballast tank/bag. Ensure each tank/bag has been exposed to 120°F water.

Refer to Advanced Decontamination Manual for additional information on complex ballast systems.



Step-by-Step Protocol for Full Decontamination (cont.)

9—M = Motor or Engine

Some marine propulsion systems require specialized equipment and procedures to be decontaminated. Please consult with your supervisor if you are uncertain.

Outboard and Inboard/Outboard Engines

- Attach the muffs to the whip hose. ➤
- Make sure the motor/engine is completely lowered. Place the muffs so that all the intake openings are completely covered. ➤
- Start the water by engaging the trigger. Check to make sure the intake openings are still covered on both sides and that the muffs are tight.
- Stand clear of the propeller and have the boat operator start the motor/engine in **Neutral**.

***Note:** If operating in colder climates, consider allowing the engine to warm up by running water through prior to starting the burner.*

***Note:** If the engine is not uptaking water when it is turned on in neutral, turn off the boat engine, release the trigger, and re-adjust the muffs.*

- Start the burner and flush the engine until the water temperature maintains 140°F for 10 seconds when measured by a thermometer at the discharge port(s). ➤
- Maintain flow and have the boat operator turn off the motor/engine.
- Remove the muffs and allow the motor/engine to drain; have the boat operator raise the engine.

Inboard

- Attach the fake-a-lake. ➤
- The fake-a-lake must be placed securely against the bottom of the hull covering the intake port.
- Start the water by engaging the trigger. Visually confirm the fake-a-lake did not shift.
- Stand clear of the propeller and have the boat operator start the engine in **Neutral**.

***Note:** If operating in colder climates, allow the engine to warm up by running water through prior to starting the burner.*



Note: If the engine is not uptaking water when it is turned on in neutral, turn off the boat engine, release the trigger, and re-adjust the fake-a-lake.

- Start the burner and flush the engine until the water temperature maintains 140°F for 10 seconds when measured by a thermometer at the discharge port(s).
- Maintain flow and have the boat operator turn off the motor/engine.
- Turn off the water and remove the fake-a-lake from under the boat.

Jet Propulsion (PWC Style Systems)

If a flushing port is present:

- Attach the jet flushing adapter to the whip hose.
- Attach the flushing adapter to the flush port.

Note: Some jet propulsion systems do not have a flushing port. Refer to *Advanced Decontamination Manual* for additional information on these systems.

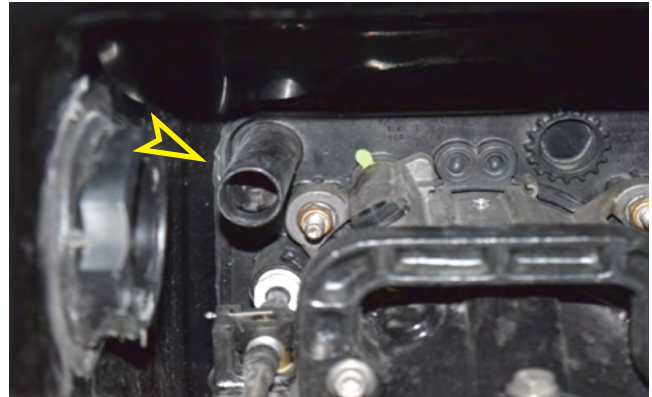
Note: Some PWCs have a separate intercooler flushing port. If present, flush it separately with 140°F water for 10 seconds without turning on the engine.

- Have the owner start the engine.
- Within 10 seconds, start the water by engaging the trigger.

Note: If operating in colder climates, allow the engine to warm up by running water through prior to starting the burner.

- Start the burner and flush the engine until the water temperature maintains 140°F for 10 seconds when measured by a thermometer at the discharge port(s).
- Turn off the water.
- Have the operator rev the engine for a maximum of 10 seconds and then turn off the engine.
- Remove the flushing adapter from the flush port.




Yamaha and other jet propulsion systems require specialized equipment and procedures to be decontaminated. Please Refer to Advanced Decontamination Manual.



Step-by-Step Protocol for Full Decontamination (cont.)

10—E = Exterior

For Watercraft and Equipment without Attached Mussels

- Attach the diffuser to the whip hose and start the burner. 
- Soak the trailer and hull below the waterline with 140°F water starting at the bow and working slowly and methodically to ensure all areas are exposed to 140°F water for 10 seconds. 
 - On an inboard engine, the strut bearing and the rudder port (**prop, prop shaft, and prop shaft support**) must be decontaminated with 140°F water under low pressure for a minimum of 10 seconds.
 - Strakes and chines should be filled with 140°F water under low pressure until water is exiting the far end at 140°F for a minimum of 10 seconds.
 - On sailboats, ensure retractable keels and centerboard boxes are decontaminated with 140°F water under low pressure for a minimum of 130 seconds.
 - On trailers, be sure to decontaminate bunks, rollers and the openings of the tubular frames. 
- The gimbal area of the inboard/ outboard engine must be soaked for a minimum of 130 seconds (it is important to do both a top flush and a side flush to ensure 100% mortality) with 140°F water.
- Consider a final high-pressure rinse if deemed necessary.

For Watercraft and Equipment with Attached Mussels

- Attach the diffuser to the whip hose and start the burner.
- Soak the trailer and hull below the waterline with 140°F water starting at the bow and working slowly and methodically to ensure all areas are exposed to 140°F water for 10 seconds.
 - On an inboard engine, the strut bearing, rudder port, **prop, prop shaft, and prop shaft support** must be decontaminated with 140°F water under low pressure for a minimum of 10 seconds.



- Strakes and chines should be filled with 140°F water under low pressure until water is exiting the far end at 140°F for a minimum of 10 seconds.
- On sailboats, ensure retractable keels and centerboard boxes are decontaminated with 140°F water under low pressure for a minimum of 130 seconds.
- On trailers, be sure to decontaminate bunks, rollers and the openings of the tubular frames.
- Depending on the level of infestation, spray the infected areas with high pressure to remove any attached ANS.
- The gimbal area of the inboard/ outboard engine must be soaked for a minimum of 130 seconds (it is important to do both a top flush and a side flush to ensure 100% mortality) with 140°F water.
- Connect the 40° nozzle with the quick connect to the end of the wand so you can use high pressure spray to remove the ANS using 140°F water.
- Keep the wand at a 45° angle and work methodically in one direction. Do not use the wand to “scrub” the hull. Keep the tip of the wand approximately 6–12 inches away from the hull and trailer as you move around the boat.



Note: If operating in colder climates, allow the engine to warm up by running water through prior to starting the burner.

WARNING: ONLY use low pressure on all carpeted areas, decals, electrical connections, gimbal area on the inboard/outboard engine, interior compartments, transducers, and depth sounders and their wiring.

- Turn off the decontamination unit when you have completed decontaminating all components. Turn the burner off first, run water through the boiler and then turn off the decontamination unit. Follow the standard operating procedures for shutting down your decontamination unit.



11—Post Decontamination. Following full decontamination, give the boat some time to fully drain.

Step-by-Step Protocol for Full Decontamination (cont.)

- Conduct a final thorough inspection of the vessel. Be sure to check all areas that were previously noted as infested prior to inspection. Also check all other areas of the boat to be sure that there are no mussels (dead or alive) remaining on the vessel. Be as accurate as possible when checking the numerous areas of the boat. If staff allows, it is preferable that the second inspection following decontamination is done by someone other than the person who did the initial inspection and decontamination.
 - If there's any evidence that mussels or other ANS remain—perform a second targeted decontamination on the areas found to have ANS.
 - **Photograph the watercraft after decontamination** in the same fashion and same locations as you photographed the boat before the decontamination.
- Photograph the watercraft after decontamination in the same fashion and same locations as you photographed the boat before decontamination.
- Ensure all documentation has been completed before the boat departs including any required next steps.
- For exiting watercraft, apply a seal and give the boater a properly filled out receipt. Be sure to fill out all procedures that were and were not performed on the seal receipt.

- Communicate any additional requirements to the boater.
- Remind the boater to clean, drain, and dry. Leave all water drain plugs & sea strainers are out during overland transport.
- Send a Watercraft Movement Notice using the Data Collector if the boat is not being launched at the station where it was decontaminated, and the destination is known.
- Follow your agency's procedure for documentation submission.
- Follow your agency's procedure for sample submission. Place sample vials in a Ziploc® bag if sample is stored in alcohol, and wrap in bubble wrap to help protect it during shipment.
- Sample Vial must be labeled with: Date, Boat Registration, and your location. Place in padded envelope.
- Mail the envelope ASAP to:
 - CPW ANS Lab
 - 6060 Broadway
 - Denver, CO 80216
- Email Invasive.Species@state.co.us or call 303-291-7295 to notify CPW that the sample is being shipped.



Full Decontamination Temperature and Pressure Table

Location	Temp	Pressure	Time	Exit Temp
Thu-Hull Discharge Ports	120°F	Low	130 sec	
Interior Compartments, equipment, storage compartments, live wells	120°F	Low		
Ballast Tanks	120°F	Low	min. of 3 minutes	105°F
Interior Engine Compartment, Bilge	120°F	Low		Plug, fill with 4-5 gal of water, flush to 120°F
Motor/Engine	140°F	Low		140°F
Exterior Hull- To Kill	140°F	Low		
Exterior Hull- to Remove	140°F	High, 45° angle		
Gimbal	140°F	Low	130 sec	
Trailer Carpeted bunks, transducer	140°F	Low		
Trailer Frame, Rollers, Prop	140°F	High		

Standing Water, Plant, Bait Decontamination Table

Treatment	Location	Temp	Pressure	Time	Exit Temp
Standing water	Interior Compartments	120°F	Low		
Standing Water	Ballast Tank	120°F	Low		105°F
Standing Water	Engine	140°F	Low		140°F
Plant	Carpeted bunks, transducer	140°F	Low	15 sec	
Plant	Frame, Rollers, Prop	140°F	High	15 sec	
Bait -Entrance	Interior Compartments or Live wells	120°F	Low		
Bait – Exit	No Decon – Boater must bring distilled water				

What if the boater will not allow an inspection or decontamination?

The goal is to gain the boater's support for the program and process. Do everything that you can to get the boater's approval to inspect the boat and decontaminate. If the owner is unwilling to cooperate, you will need the assistance of law enforcement officers to order decontamination, impound, or quarantine a boat.

Guidelines concerning impoundment

- If a boater is entering a water body and there is no evidence of mussels or other ANS on the boat, and the boater refuses an inspection, the boat should be turned away but not impounded.
- If the boater is leaving a suspect, positive, or infested water body and the boater refuses an inspection, then the boat should be inspected prior to launching in another water body. If the

boat owner is not compliant, call law enforcement to impound the vessel until proper inspection and/or decontamination can be performed.

- If suspected or known mussels or other ANS are present on a boat and the boater will not consent to an inspection or decontamination, or if decontamination equipment is not available or working, then the boat should be impounded by law enforcement until decontamination can be performed.

Do not let an infested vessel leave the inspection station without a law enforcement escort if it is infested or you suspect it is infested! If you are not able to safely detain the vessel until law enforcement can arrive, be sure to have all of the boater's information and a physical description of the boater, the watercraft, and the towing vehicle so an officer can follow up.



What options does the boater have if the decontamination unit is broken or if the WID station doesn't have a decontamination unit?

Possession of zebra mussels, quagga mussels or other ANS is illegal. A boat is not allowed to transport zebra or quagga mussels or any ANS. If there is a reasonable belief that the watercraft has ANS present, call the nearest peace officer (e.g. Wildlife Manager, Park Ranger, County Sheriff, etc.) and call your supervisor. If zebra or quagga mussels are confirmed, do not allow the boat to leave until law enforcement officials arrive. Options include:

- Quarantine the boat on site until a working decontamination unit can be brought there.
- Escort the boat to the nearest decontamination station.
- As an absolute last resort for a boat with standing water and **no** confirmed or suspected mussels or ANS, you could direct the boater to the nearest decontamination station, although this option is not preferred.

Watercraft inspection and decontamination stations are placed at various locations throughout the state and western U.S. For the most updated list of these sites, call (303) 291-7295 or visit www.cpw.state.co.us.



Mandatory Boat Inspection Station



**Boat Must Be Inspected
Before Entering.**



STOP AQUATIC
HITCHHIKERS!

www.cpw.state.co.us

State of Colorado

Inspection/Sample #: --
Water Code Date (month, day, year) Boat Registration Number

(ANS) DOCUMENTATION and VESSEL DECONTAMINATION FORM

Specimen Collection and Shipping Instructions

1. Collect all specimens, including any shell fragments, carefully to avoid damage. Use clean, sterile tools to prevent contamination.
2. Place specimens in screw-capped sample vials.
3. If samples are desiccated or dry shell fragments, **do not use ethanol**.
 - a. Only if the sample is a live mussel, or very recently dead with tissue still inside the shell, should you fill the vial to half full with 70% ethanol. Note: Trace amounts of chlorine from tap water, or "dechlorinated" tap water can completely destroy sample DNA. Do not use formaldehyde.
 - b. Write the date, boat registration number, authorized location, and inspector number **in pencil** on a small slip of paper and put it directly in the sample vial with the ethanol and sample. Note: Ethanol will make any ink completely illegible. **Do not use a pen or marker**.
 - c. Once the vial contains the sample, ethanol, and in-vial label, screw the cap on tightly and securely seal with electrical tape.
4. Fill out an adhesive label **in pencil** and apply to the outside of the vial.
5. Fill out the lower half of this page **in pencil**. Cut off the lower half of this page.
6. Place the vial and the lower half of this form in a Ziploc bag.
7. Place the Ziploc bag (containing the vial and completed form) in a padded envelope.
8. Overnight ship sample to Attention ANS Lab 6060 Broadway, Denver CO 80216
 - a. ASAP (within 24 hours).
9. Email Invasive.Species@state.co.us to notify CPW that the sample is being shipped.
10. If you have questions, call (303) 291-7295.
11. Remember to disinfect all collection tools by soaking them with 140°F hot water or storing them in acetic acid or vinegar solution.

🔑 Remove bottom half of page and include in mailer with vials being shipped to CPW for analysis.

SUSPECTED (ANS) COLLECTION FORM FOR WATERCRAFT INSPECTION STATIONS

Authorized Agent's Name: _____

Inspector ID Number: _____ Email: _____

WID Station Supervisor Name: _____

Phone Number: _____ Email: _____

WID Authorized Location Name: _____

Address: _____

Date and Time of Collection: _____ Watercraft Registration Number: _____

Trailer Plate Number: _____ Watercraft Green Seal Code: _____

REASON FOR COLLECTION (check all that apply) Zebra or Quagga Mussels Attached
 Visual ID of ANS Bumps on Boat/Trailer Plants on Boat/Trailer Unidentifiable Organic Material

LOCATION OF SUSPECTED ANS PRIOR TO COLLECTION

Watercraft Hull Motor Live Well Anchor Bilge Watercraft Interior
 In Lake/Reservoir Other: _____

Date Mailed: _____ ▼ Do Not Write Below Line: **For Lab Use Only**

Date Received at ANS Lab: _____ Unique ID #: _____

Date Identified: _____ Notes: _____

Technician: _____ Further Analysis Needed: _____

Collector Contacted with Results: _____

Step-by-Step Instructions for Winterizing Trailered Hydro Tek Units

Winterize the Decontamination Unit

1—Roll out **six feet** of pressure hose and hold the trigger in the **open** position.



2—Fill the container with two to three gallons of antifreeze.



3—Start up Hydro Tek unit and run the pump (no heat) until the colored antifreeze comes out of the gun. Shut down unit as soon as antifreeze comes out of the gun by following the standard operating procedures.



***Note:** When switching the valve back to the water supply for decontamination, it is possible to recycle the two gallons of antifreeze which is in the machine and hose before the water begins to flow.*

4—Connect supply hose and store with trigger in elevated position for winter to avoid antifreeze siphoning out.

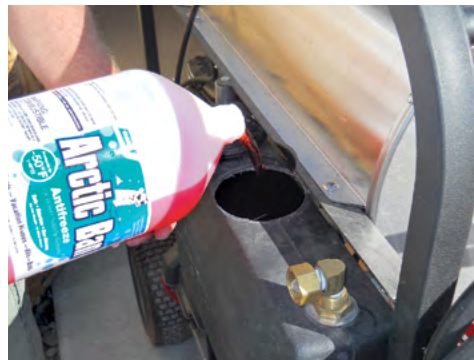


5—Be sure to drain the water tank at the end of the season before storing in a secure location.

Step-by-Step Instructions for Winterizing Non-Trailered Hydro Tek Units

Winterize the Decontamination Unit

1—Pour a minimum of two gallons of RV/Antifreeze into the holding reservoir.



2—Depress the trigger.



3—Turn on the unit (**no heat**) and run it until antifreeze comes out through the trigger.



4—Store the unit with trigger in elevated position above the reservoir.

To Operate a Winterized Unit:

Begin by attaching a water source to the unit. Aim the trigger unit into a container to catch the antifreeze, then squeeze the trigger unit and turn on **ONLY** the pump (not the burner). This sends water through the system, pushing out the antifreeze. The unit will expel pink antifreeze, continue collecting the output until the pink fluid begins to lighten in color. While antifreeze can and should be reused, it becomes ineffective when diluted. Once the water coming out of the trigger is totally clear, the unit is de-winterized and ready to be used as normal.



Step-by-Step Instructions for Winterizing On-Demand Units

Winterize the Decontamination Unit

1—Disconnect all hoses from the system and leave both inlet and outlet spigots open to allow for water drainage. ➔



2—Unscrew the black caps shown. There is one for each red and blue pipe on each of the three water tanks. ➔



3—Turn the lever directly behind the black cap to be perpendicular to the pipe. There is one lever to turn for each black cap—six in total. ➔



4—Turn off the propane supply by turning the levers to be perpendicular to their pipes. In addition, turn off the main propane supply from the behind the shed. ➔

5—Remove the cap from the condensate neutralizer to allow the water to drain. Reinstall the cap. ➔



6—Lift the silver lever from the downward position to the upward position perpendicular to the pipe. ➔



7—Unplug black water tanks from power outlets. ➔



Decontamination Unit

Photo Glossary

Burner on/off switch—This switch activates the burner to heat the water. Squeeze the trigger on the spray gun and the burner will begin heating the water. It will stop firing whenever the water spray is off or if the temperature setting is exceeded. After turning the switch off, be sure to run water through the system to cool the boiler. ➔



Choke—When first starting the decontamination unit, pull the choke out and turn the key until the engine starts. Push the choke in immediately after the unit starts. ➔



Diffuser—This attachment connects directly to the spray gun and is used to decontaminate discharge ports, soak carpeted areas on the boat and/or trailer and standing water flushes for any interior compartments. It provides low pressure and a rubber tip to prevent scratching any surface. ➔



Dual lance wand—This attachment connects directly to the spray gun. The other end has a quick connect fitting so that a nozzle or connecting hose can be “quickly” attached by pressing down the outer ring and pressing the “other half” of the quick connect fitting into its center. The handle, when turned clockwise, directs the water through the lance with the quick connect fitting only. If a nozzle is attached the water exiting the wand will be at high pressure. The handle, when turned counter clockwise, directs the water through both lances and lowers the pressure of the water. A dual lance wand can be used for low pressure standing water flushes if there is no nozzle attached and the water is exiting both lances. ➔



Fake-a-lake—This attachment is used for decontaminating inboard engines and ballast tanks. It has a telescoping leg and the hose attachment threads into the connection on the “plunger,” joining the fake-a-lake to the hose to the wand.



Hose for connecting attachments—This six foot hose has a quick connect fitting that connects to the end of the wand. The other end threads into the fake-a-lake or muff attachments needed for a decontamination.



Muffs—Muffs are used to decontaminate the lower unit of an outboard motor or inboard/outboard engine. The muffs pictured at the top of the photo are used for all new models of the outboard motor and inboard/outboard Mercury engines that have open intake ports. The lower muffs are used on all other outboard and inboard/outboard motors or engines.

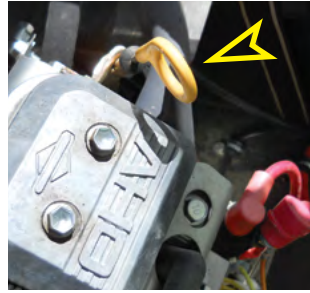


Nozzle and nozzle storage—The Nozzle Storage area shows the degree of the nozzle written below the nozzle and its spray pattern is shown above the nozzle. The preferred spray pattern is 40°. Nozzle color and degrees can vary by manufacturer. A nozzle is attached to the end of the wand with a quick connect fitting. Be sure the quick connect “clicks” into place when attaching the nozzle. Point the wand and nozzle towards the ground when you first engage the trigger to start the water. This is a safety issue and will ensure that no one or nothing will be hurt or damaged if the nozzle blows off the wand.



***Note:** All red colored nozzles (0°) have been removed and should never be used for boat decontaminations. The 15° nozzles are also not recommended.*

Oil dip-stick for the decontamination unit's engine—This should be checked prior to every use. Use 30-weight detergent oil to keep the oil reservoir topped off.



Oil dip-stick for the decontamination unit's pump—This should be checked prior to every use. Pump oil is used to keep the oil reservoir topped off.



Quick connect fitting—This fitting comes in two parts. The part that is attached to the end of the wand has to have the external circle pressed down before the “male” portion of the fitting can be inserted. The external circle then must “click” in place to make a proper connection.



Spray gun with trigger—This photo of the gun has the trigger held open. The wand or the diffuser attachment thread directly onto the gun.

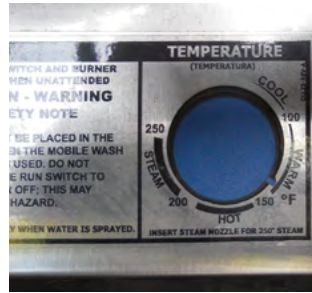


CAUTION: The spray gun kicks back when the trigger is engaged—hold with both hands.

Thermometer—Thermometers are essential to the decontamination process. It is used to initially test the temperature of the water prior to the decontamination. It is also used to check the exiting water temperature when performing a standing water decontamination for interior compartments and engine flushes.



Thermostat—The thermostat allows the water temperature to be adjusted so that different decontamination temperature protocols can be adhered to by the inspector. Every machine's temperature is different depending on the altitude of its location and the temperature of the water in the tank. Be sure to test the temperature of the water with a thermometer prior to beginning and during all decontaminations.



Winterizing kit for trailered Hydro Tek units—This kit allows the decontamination unit to be winterized for protection. However, if it needs to be used for a decontamination, the operator just turns the yellow handle 90°, starts the unit (**no heat**) and recycles the antifreeze back into the red container. The unit is then ready for decontamination. When finished with the decontamination, the operator turns the yellow handle back to the position shown in the photo and runs the unit (**no heat**) until the pink colored antifreeze comes out of the spray gun.



Chapter 6 Review Questions—Watercraft Decontamination Procedures

1. The goal of decontamination is to _____ and _____ ANS from a watercraft and trailer.
2. Although it is rare, we sometimes use chemicals to kill ANS during decontamination. True or False
3. What are the four types of decontamination and what are they used for?
 1. _____
 2. _____
 3. _____
 4. _____
4. Why is the location important when we perform decontaminations?

5. Put the following in the correct order when performing a full decontamination.
 1. _____ a. Document
 2. _____ b. Decontaminate
 3. _____ c. Collect
 4. _____ d. Report
6. According to the ANS protocols, which boat(s) should get decontaminated?
(Assume none of these examples have unverifiable water.)
 - a. A boat from a positive or suspect water from last weekend that is completely dry everywhere.
 - b. A boat from a positive or suspect water from 90 days ago with 2 gallons of water in an oily bilge.
 - c. A boat from a positive or suspect water from 21 days ago with standing water.
 - d. A boat from out of state that has no standing water.
7. When performing a flush of an I/O or outboard motor, always be clear of the prop and ask the boater to start the boat in: (circle one) a. drive b. neutral c. reverse.
8. What are the temperature requirements for decontamination?
 - a. Interior Compartments = 100°F; Exterior = 160°F
 - b. Interior Compartments = 120°F; Exterior = 140°F
 - c. Interior Compartments = 140°F; Exterior = 180°F
 - d. Interior Compartments = 180°F; Exterior = 200°F

9. What order is recommended for a **full decontamination** of a boat?
- Hull, trailer, engine, back of boat, interior compartments, anchor
 - Through hull discharge ports, interior compartments, motor/engine, rinse exterior and trailer, then high pressure hull and trailer.
 - Engine, trailer, interior compartments, hull, back of boat, anchor
 - Anchor, back of boat, trailer, hull, engine, interior compartments
10. How long do you back-flush discharge ports with low pressure, 120°F water during a full decontamination?
- _____
11. How long do you decontaminate plants with low pressure, 140°F water?
- _____
12. How long do you flush the gimbal area with low pressure, 140°F water?
- _____
13. How often do you need to start up and use your decontamination unit if not performing regular decontaminations?
- _____
14. Which one of these boats does get a mandatory standing water decontamination if they have no seal and receipt? (circle all that apply)
- Ski boat with an inboard/outboard engine
 - Wakeboard boat with a ballast tank
 - Fishing boat with an outboard motor
 - Ski boat with an inboard engine
15. What attachment do you use to flush a ballast tank or inboard engine?
- Diffuser
 - Dual Lance Wand
 - Fake-a-Lake
 - Engine muffs