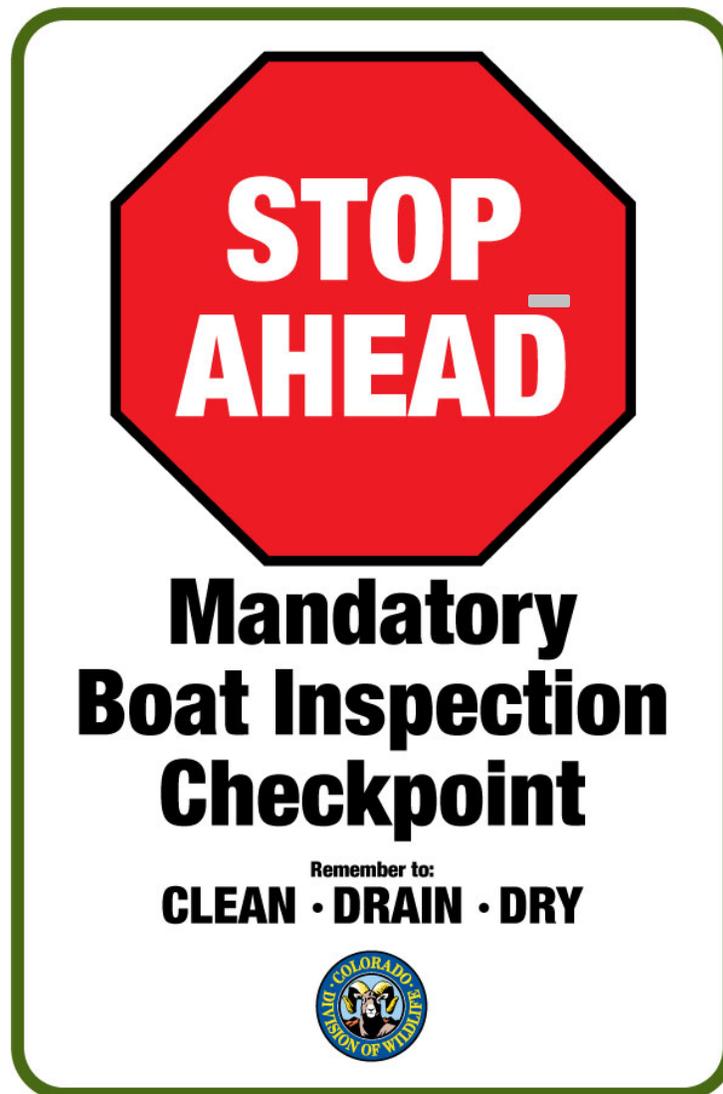


State of Colorado Containment Manual for Watercraft Inspection and Decontamination Stations



A supplement to the Official Watercraft Inspection and Decontamination Procedures



Updated – September 2013

This project was funded by the U.S. Fish and Wildlife Service through the *Quagga Zebra Action Plan for Western Waters (QZAP)* grant.

This document furthers the needs identified in QZAP Section B. Prevention:

- B.1. – Mandatory Watercraft Inspection and Decontamination at Infested Waters.
- B.2 – Continue the development of effective watercraft inspection and decontamination protocols and standards.

Protocols in this document are consistent with the *Uniform Minimum Protocols and Standards for Watercraft Inspection and Decontamination for Dreissenid Mussels in the United States*.



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Purpose

The State of Colorado has implemented a partnership based, multi-jurisdictional, mandatory watercraft inspection and decontamination program to prevent the spread of Aquatic Nuisance Species (ANS). The purpose of the *State of Colorado Containment Manual for Watercraft Inspection and Decontamination Stations* (Manual) is to provide standard containment protocols across jurisdictions within Colorado, and potentially across the West. This Manual details the watercraft inspection and decontamination (WID) containment procedures to contain and prevent the overland spread of aquatic nuisance species. These procedures apply to all aquatic nuisance species, both plant and animal, but are strongly focused on zebra and quagga mussels (ZQM).



Quagga mussel encrusted engine being decontaminated

The Manual is an important piece of the broad statewide training and quality assurance program in place for ANS. This manual provides direction for implementation of containment protocols, as Colorado has done previously for prevention WID stations in the 2009 publication, *Colorado Watercraft Inspection Handbook: Official WID Procedures*. Since that time, the state has also published the *Colorado ANS Watercraft Decontamination Manual, 2011*, and *Colorado Boat Compendium for ANS Inspectors, 2012*. The *Containment Manual* is the final portion of the regulation referenced “Official WID Procedures” to be published. These four documents combined will provide a comprehensive and consolidated *Colorado WID Procedures Curriculum* and *WID Trainer’s Guide* in January 2014. In the past, other states have utilized portions of Colorado’s previous publications. Therefore, it is anticipated that these containment procedures may have broader implementation than in this state alone.

We realize the inherent difficulty in implementing a regionally consistent watercraft containment program. Adding to the challenge is that numerous programs are already in place, while others are in the early planning or implementation stages. In some instances, changes to regulations at the local, state and possible federal level may be necessary to implement a comprehensive multi-jurisdictional program. However, because each entity is unique; having different missions, authority, resources, facilities and governing bodies, it is understood that additional or stricter standards may be implemented and that cross-jurisdictional reciprocity should be left to the discretion of the implementing agency/organization (UMPS, 2012).

This Manual documents the standard for WID containment that can be rapidly implemented anywhere ANS is detected to prevent the spread overland on watercraft. Implementation of these procedures is, of course, dependent on available resources.

Introduction

Invasive species are a threat to the economy, natural resources, outdoor recreation, agriculture, industry, water storage and transportation. Since the discovery of quagga mussels in Lake Mead in 2007, and other aquatic nuisance species (ANS) in the west, ANS have become a high priority for containment and prevention in western waterways.

ANS plants and animals threaten native species and interfere with municipal, commercial and agricultural water supply and distribution, and recreational activities. In their native environments, ANS populations are typically held in check and controlled by predators, parasites, pathogens, and competitors. However, when they are transported to a new environment, the natural checks are usually left behind. This gives invasive plants and animals an advantage over native species and makes them very difficult to control.

It is generally accepted that mussels cannot move overland without some help (Padilla and others, 1996; Kraft and Johnson,



Zebra Mussels at Cheney Lake, Kansas

2000). The catalyst for such movement is further accepted and recognized as involving some form of

human intervention. This intervention can be in the form of water conveyance (canals, channels, pipes, pumps, etc.), watercraft (various recreational and commercial types) and associated boating equipment (ropes, anchors), direct and/or inadvertent movement of water (e.g. with live bait), or fishing equipment (boots, clothing, gear). Each of these means of transport requires a degree of human activity to provide a mechanism to connect an infested water body to one that is not naturally “connected” (Giusti, 2011).

Prevention - To stop, or attempt to stop, the introduction of ANS.

Containment- To stop, or attempt to stop, ANS from spreading.

Since the confirmation of quagga and zebra mussels, and other ANS, in many reservoirs and lakes throughout the west, **prevention** and **containment** protocols are mandatory in Colorado to prevent the distribution of these harmful species.

Legal Basis

The Colorado State Legislature passed the ANS Act (SB08-226) in response to the discovery of quagga and zebra mussel veligers in several Colorado reservoirs in 2008. The legislative goal is written as “***...It is the intent of the General Assembly that prevention, containment and eradication of aquatic nuisance species in the waters of the state in which such species have been detected or are likely to be introduced shall be the Divisions (Parks and Wildlife) HIGHEST PRIORITIES.***”

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 possibly 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 ANS Law (SB08-226) and Regulations (Parks-8-801) prohibit the possession and transportation of zebra or quagga mussels, or other listed ANS.**

#801 – POSSESSIONS OF AQUATIC NUISANCE SPECIES

A. Except as provided in these regulations or authorized by the Divisions or under Title 33 or Title 35 C.R.S., it shall be unlawful for any person to possess, import, export, ship, transport, release, place, plant, or cause to be released, placed, or planted into the waters of the state any aquatic nuisance species.

D. It is unlawful for any person to, or to attempt to, launch onto, operate on or remove from any water of the state or vessel staging area any vessel or other floating device if they know the vessel or other floating device contains any aquatic nuisance species.

The ANS regulations require **mandatory watercraft inspection and decontamination**, if necessary, of:

- watercraft coming in from out of state
- **watercraft leaving a containment water body in Colorado**
- watercraft entering a high-risk water where inspections and decontaminations are required by the owner or a managing entity

#803B: All persons transporting a vessel or other floating device from a water of the state known to be infested as determined in regulation #806D, must be inspected prior to leaving the infested water, or if state authorized inspection facilities are not open or otherwise unavailable, must be inspected prior to launch in any other water of the state.

The ANS Regulations also set the standard for training and certification, watercraft inspection, decontamination, impoundment, sampling, monitoring, identification and reporting. Authorized Agents at Containment Waters in Colorado are **required to implement this WID Containment Manual Procedure.**

*#802A - The Divisions may certify private inspectors and/or decontaminators. Such persons shall not be authorized to stop, detain, impound a vessel or other floating device, or order a vessel or other floating device decontaminated or quarantined. Such persons, once certified, are only authorized to provide inspections and/or decontaminations **in accordance with WID procedures** to persons transporting vessel or other floating device who voluntarily request their services.*

*#802B - Authorized agents shall be certified by the Divisions **prior to** providing any inspection or decontamination services.*

*#802C - Prior to providing any inspection and/or decontamination services, authorized agents and private inspectors and/or decontaminators must successfully **complete the Divisions' training course**, must maintain active certification and must comply with all quality assurance requirements as listed herein.*

#803A - Inspections may be conducted by:

- 1. Any qualified peace officer;*
- 2. Any authorized agent or private inspector and/or decontaminator who has been **properly trained as required by the Divisions**, who holds a valid, active certification and who is in good standing with the Divisions' quality assurance checks.*

It is imperative that inspectors and decontaminations also 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.



Quagga mussels at Lake Pleasant, AZ

While this document 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.

#800.A.1 - Aquatic nuisance species means exotic or nonnative aquatic wildlife or any plant species that have been determined by the board to pose a significant threat to the aquatic resources or water infrastructure of the state, including, but not limited to, the following:

Animals:

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

Plants:

Common Name	Scientific Name
African elodea	<i>Lagarosiphon major</i>
Brazilian elodea	<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>Nymphaoides peltata</i>

Wildlife Chapter 0 Regulations also define prohibited aquatic species and contain a list of prohibited fish, animals and pathogens, which includes the animal species listed above. The *Colorado ANS Pocket Guide* [CO Division of Wildlife and Colorado Department of Agriculture, 2010] provides a comprehensive list and description of ANS that could negatively impact native species, recreation, or water resources. Additional information about zebra and quagga mussels, New Zealand mudsnails and other native and non-native mollusks can be found in the *Colorado Mollusk Pocket Guide* [CO Division of Wildlife, 2011].



NZMS on a rock in Eleven Mile Canyon

Regulation #806D: To initially identify waters infested with aquatic nuisance species, the following standards will be applied before notifying the public of the existence of these aquatic nuisance species:

- 1. Zebra and Quagga mussel veligers. A multi-phase testing process involving both visual and molecular identification methods will be completed in accordance with the procedural checklist “Multi-Phase Identification of Zebra/Quagga Veligers” available from the Divisions.*
- 2. Zebra and Quagga mussel adults or New Zealand mudsnails.
Concurring identification by two or more mollusk identification experts.*
- 3. Rusty crayfish.
Concurring identification by two or more crustacean identification experts.*
- 4. Waterfleas.
Concurring identification by two or more plankton identification experts.*
- 5. Aquatic nuisance species plants.
Concurring identification by two or more aquatic botanical experts.*

The following **water body definitions** identify water bodies based on early detection sampling methodology:

- **Negative** - sampling is ongoing and nothing has been detected, or nothing has been detected within the time frames for de-listing.
- **Inconclusive** – Temporary status for a water body has not met the minimum criteria for detection.
- **Suspect** – Water body that has met the minimum criteria for detection (regulation #806-D-1).
 - In Colorado, suspect waters must implement containment WID procedures.
- **Positive** – Multiple (2 or more) subsequent sampling events that meet the minimum criteria for detection.
 - In Colorado, positive waters must implement containment WID procedures.
- **Infested** – A water body that has an established (recruiting or reproducing) population of ANS.
 - There are currently no infested waters in Colorado.



Right: Zebra mussel infestation at El Dorado Reservoir, Kansas

Monitoring

Monitoring is an integral part of any ANS program. *The State of Colorado Sampling and Monitoring Aquatic Nuisance Species Protocol Manual (2013)* contains detailed protocols for monitoring waters for invasive mussels and other ANS.

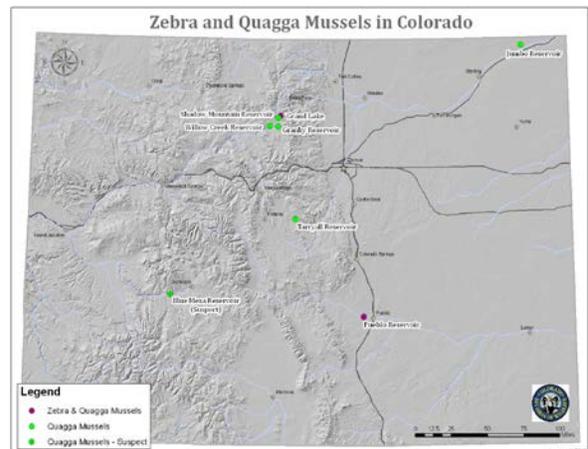
CPW prioritized waters for monitoring based on a statewide risk assessment that specifically evaluated the risk of introduction of ZQM. The risk assessment identified 168 total public lakes and reservoirs divided into 19 very high risk waters, 17 high risk waters, 58 medium risk waters, and 64 low risk waters. The frequency and quantity of annual sampling is risk dependent. CPW monitors streams and rivers on a rotating basis annually by need and priority.

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 detect veligers, 2) check substrates to detect “settlers” or adults and 3) conduct surveys along the shoreline and existing structures for settled juveniles or attached adult mussels. Identification of plankton tows includes a cross-polarized light microscopic visual analysis, followed by two-phase DNA analysis (polymerase chain reaction [PCR] and gene sequencing) for verification.

Verification of ANS in a water body will trigger an increase in the frequency of sampling events and the quantity of sampling sites within the water body. Enhancements to the state’s monitoring program for suspect and positive waters include volunteer monitoring and SCUBA.

Current Status of Zebra and Quagga Mussels in Colorado

Pueblo Reservoir, Granby Reservoir, Grand Lake, Shadow Mountain Reservoir, Willow Creek Reservoir, Tarryall Reservoir and Jumbo Reservoir all tested positive for microscopic juvenile zebra and/or quagga mussel veligers in 2008. Since that time there have been no new positive waters listed. Subsequent testing identified veligers in Pueblo Reservoir in 2009 and 2011.



In April 2009, Blue Mesa Reservoir began implementing containment procedures due to quagga mussel DNA detection. U.S. Bureau of Reclamation samples from 2011 and 2012 also indicated that quagga mussel DNA was present in Blue Mesa.

Elements of a WID Containment Program

Following the detection of ANS, rapid response is essential to contain the invasive species and prevent its spread to other waters. This Manual focuses on containing the overland spread of ANS hitchhiking on trailered watercraft through the implementation of WID procedures. It does not discuss other response topics, such as evaluation of potential control methods, communications or research.

The elements of a containment program are education, watercraft inspection and decontamination, and enforcement

*“The best method of protection against an invasive mussel introduction is through preventative measures. Prevention is much less expensive than containment or control efforts. Although **containment at infested waters is the top priority**, CDOW [CPW] recommends that focus be placed on prevention through field watercraft inspection and decontamination, in conjunction with education and information efforts.”*

State of Colorado Zebra and Quagga Mussel Management Plan, 2008

The scale at which these elements are implemented is entirely dependent on the resources available to the state and contributing partners.

*“Due to the multi-jurisdictional nature of Colorado waters, the ZQM Plan recommendations apply to all partners; **for no single entity is responsible for, or capable of, implementing all of the necessary actions needed to protect Colorado waters from invasive mussels or other ANS.**”*

State of Colorado Zebra and Quagga Mussel Management Plan, 2008

The greatest variability with respect to implementation of the containment WID procedures is in relation to not only the resources allocated for containment, but also the ability of managers to control access and traffic, in addition to the volume and complexity of watercraft.

“...the ability of containment reservoirs to implement the following protocol is completely dependent on the number of boats at that specific time along with the number of inspection and decontamination points and the complexity of watercraft. As the number of complex boats increase, the ability of the Authorized Location to perform high risk inspections and standing water decontaminations decrease. Therefore, it stands to reason that more boats will get inspected and decontaminated on slower weekdays than on busy weekends – or at smaller reservoirs versus larger reservoirs – or at reservoirs with more ramps than those with less ramps. Prevention waters need to be on high alert for watercraft that have previously been boating in containment waters and have not been decontaminated.”

Official Colorado WID Procedures, 2012

Education! Education! Education!

Education is the most important part of any ANS Program. There will never be enough money to have inspectors at all waters at all times. Therefore, it is imperative that we engage boaters and educate them so they will inspect and drain their boat after each and every use. If boaters, anglers and professionals clean, drain and dry their boats and gear, we can stop the spread of ANS!



A bare minimum containment response is for managers to post signage at all suspect, positive and infested (containment) waters and educate users to clean, drain and dry. It is important to emphasize standard messaging and social awareness to help prevent the spread of ANS. Success of containment and prevention programs depend largely on the cooperation and understanding of the public. There are many outlets that can be utilized in order to spread awareness about ANS including, but not limited to: kiosks, physical signs, highway billboards, radio spots, one-on-one communication, interpretive programs, brochures, and “brand” recognition (e.g. Stop Aquatic Hitchhikers and Clean, Drain, Dry).

A communication strategy should be developed as part of response planning for a verified detection of ANS. The following are a few elements that should be included:

- Professional notification of the detection and response strategy
- Public notification of the detection and management options being implemented
 - Press release (media - newspapers, television, radio, magazines, etc.)
 - Signs must be posted at boat ramps, entrance stations and foot access points alerting the public that ANS are present and what they must do to avoid spreading the ANS to new waters.



- Website information
- Fact sheets for agency customer service representatives to answer questions
- Rack cards, handouts or brochures with more detailed information for specific water bodies or specific user groups (e.g. boaters, shoreline homeowners, etc)
- Outreach to local businesses whose customers frequent the containment water body (e.g. marine dealers, marine service centers, angling shops, etc.)
- Outreach to local sporting groups that frequent the containment water body (e.g. fishing clubs, ski clubs, sailing clubs, homeowners associations, etc.)

For containment programs, informational items should include the following:

- ANS name and biology
- Description of the ANS impacts to the resource and to specific user groups
- Direction on species identification and reporting sightings
- Information on how people can prevent the spread of ANS
- Requirements for users after recreating in containment waters
- Management changes as a result of the presence of ANS

Having consistent messaging across jurisdictions is also important to avoid confusing the public and to help streamline inspection and containment programs. A containment program cannot be successful without a strong educational campaign to inform the public and change attitudes and behaviors. Research has shown that people are more likely to respond in a desirable way if they understand how their actions affect the resource rather than emphasizing regulations or fines (Wallace, 1990). While this is most often the case, it is important to have the cooperation and support from local law enforcement in the rare instance that a boater is uncooperative or it becomes necessary to impound a boat.



Watercraft Inspection and Decontamination

The Goal for Every Boat:

- Clean, Drain, Dry in between each and every use!
- No Water. No Plants. No Mud. No Mussels.

What are the priorities of a watercraft inspector?

1. Ensure Personal and Public Safety

Your safety and the safety of the public is the inspector's top priority at all times. Many vehicles and boats will be moving around the inspection area. People will be looking under wheels and through the watercraft. All efforts must be made to ensure safety of all involved.

2. Educate Boaters

Every contact made with boaters educates 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 have a lot to lose, in terms of access and recreational opportunities, if they do not help in this effort. The primary education message is **Clean/Drain/Dry**:

Clean—Remove all plants, animals, and mud. Thoroughly wash everything.

Drain—Drain every space or item that can hold water.

Dry—Make sure your watercraft is completely dry before leaving 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 section and in the *WID Procedures*, inspectors are ensuring that the biological risk of the watercraft is reduced prior to launch and after exiting positive waters. Green seals and receipts help inspectors identify watercraft risk much easier and faster.

4. Draining standing water.

Colorado's WID procedures are largely based on mitigating the risks associated with organisms that get transported 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 of the utmost importance that standing water be drained in between each and every use.

5. Decontamination.

If there is a known ANS or suspect ANS on a watercraft, or standing water that cannot be drained, sponged, pumped or toweled out, it must be decontaminated. See *Decon Manual*.

SEAL AND RECEIPT

The first step in the entrance inspection procedure is to check for a seal and verify the receipt. The last step in the exit inspection procedure for both prevention and containment reservoirs is to apply a seal and receipt. Therefore, it is critically important to fully understand the seal and receipt system. **State of Colorado WID Procedures is to seal and provide receipts to all trailered, motorized watercraft exiting a containment water body.**

What is the inspection wire 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 is green but the color is essentially irrelevant. The seal locks the watercraft to the trailer indicating to the last inspector it has not launched since the seal was issued. The receipt accompanies the seal and provides documentation regarding date of last inspection, protocol used, type of decontamination, if any and other important information.

Boats will get a green wire seal if...

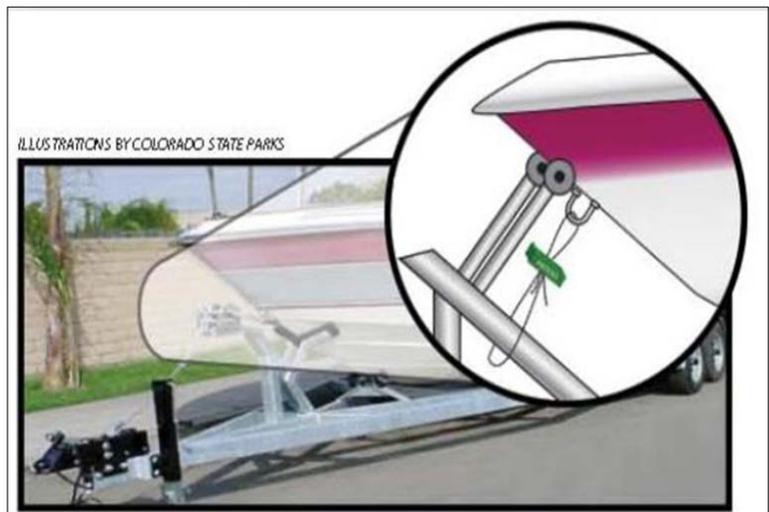
A. The watercraft leaves a **containment** reservoir (suspect or positive) and passes either a high-risk inspection or a decontamination. Ballast tanks intending to go to a different location next must be flushed.

NOTE: Containment reservoirs will use a BLUE seal receipt to provide a visual notification to the next inspector indicating that the watercraft is coming from positive/suspect waters.

B. The watercraft leaves a **prevention** reservoir (negative) and passes an Exit Inspection or a decontamination.

C. The watercraft comes to an office or business WIDS and passes either an inspection or decontamination.

NOTE: It is critical to attach the seal in a way that it will be broken if the watercraft is separated from the trailer. Typically, the wire seal goes between the eyebolt and hard, welded part of the winch. Be advised that some winches can be unrolled completely and separated from the seal without breaking.



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 is very important because it tells you, the inspector, what kind of inspection and/or decontamination was performed at the last site, in addition to when it was performed. This information will tell you what level of inspection or decontamination, if any, is necessary prior to launch.

PREVENTION WATERS WHITE SEAL RECEIPT:

State of Colorado

INSPECTION AND DECONTAMINATION SEAL RECEIPT

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

WID Location: _____

Date/Time: _____

Inspector's ID #: _____

Vessel Registration (CL #): _____

Trailer Plate #: _____ Seal Serial #: _____

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

Exit (HEAD) Inspection:	<input type="checkbox"/> Performed	or	<input type="checkbox"/> Not Performed
Exit High Risk Inspection:	<input type="checkbox"/> Performed	or	<input type="checkbox"/> Not Performed
Full Decontamination:	<input type="checkbox"/> Performed	or	<input type="checkbox"/> Not Performed
Standing Water Decontamination:	<input type="checkbox"/> Performed	or	<input type="checkbox"/> Not Performed
Plant Decontamination:	<input type="checkbox"/> Performed	or	<input type="checkbox"/> Not Performed
Bait Treatment or Decontamination:	<input type="checkbox"/> Performed	or	<input 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 let boat launch if one of the following are true:

1.) Boat is returning to the same location; or	NOTES:
2.) Boat has been out of the water for more than 30 days; or	_____
3.) Boat has been decontaminated; or	_____
4.) Boat is clean and fully drained.	_____

If not, perform an inspection prior to launch. _____

FILE COPY

Distribution: White—Owner/Operator Yellow—Inspection Location

1 - 6/2013 - 140,000 13-EB2-12-4/3250FY3

SEAL AND RECEIPT REMOVAL WID PROCEDURE AT CONTAINMENT LOCATIONS

- A. If one of the following scenarios is true, the protocol is to verify the receipt, ask about live aquatic bait, thank the boater and allow launch.
- Watercraft is returning to the same lake/reservoir
 - Watercraft has been out of the water more than 30 days
 - Watercraft has been decontaminated for standing water
- B. If the watercraft is from a **different containment** location and was not out of the water for more than 30 days AND was not decontaminated for standing water:
- Inspect for standing water
 - Ask the boater to pull the bilge or drain plug and lower motor/engine, and inspect the interior compartments.
 - If there is water, decontaminate the motor or compartments with any standing water remaining in them.
 - If there is no water, cut off the seal, ask about live bait, thank the boater and allow them to launch.
- C. If the watercraft was fully decontaminated because it was an infested mussel boat:
- Perform a high risk inspection
 - Perform a full decontaminate if any mussels are found
- D. If the watercraft is from a prevention location, verify the watercraft is drained, ask about live aquatic bait, thank the boater and allow launch.

Seals and Receipts Explained to the Public:

- Green does NOT mean go!
- A green seal is proof of prior inspection.
- It will speed up entry to the next water.
- You still have to stop at the inspection station and have the seal and receipt verified.
- You will be allowed to launch if you are returning to the same location, been out of the water for more than 30 days or the watercraft is clean and dry.
- If you are not returning to the same location or the boat has not been out of the water for more than 30 days, you may get a quick check prior to launching.
- If the watercraft is not clean and dry, you will most likely get re-inspected.
- Keep your watercraft clean and dry and get on the water faster!

WID CONTAINMENT PROTOCOLS and STANDARD PROCEDURES

It is important to note that slightly different procedures are necessary for containment of different types of ANS, and different life stages, as well as the degree of infestation at any particular body of water. The current procedures enacted at Colorado's Authorized Locations for containment focus on stopping the spread of standing water that could potentially transport veligers. This is because adult zebra or quagga mussels have never been found in Colorado.

The **goal** is to perform a high risk inspection on all trailered and motorized watercraft, and to issue a green seal and receipt to all boats exiting the lake or reservoir. The protocol places focus for inspection and decontamination on watercraft not intending to return to the same location, and watercraft that cannot be drained.

Rules about WIDS at Colorado Containment Waters:

1. Watercraft entering must be inspected – prevention procedures.

The primary purpose of performing entrance inspections at positive or suspect waters is to stop the continued inoculation of the known invasive species into the reservoir, and to prevent new invasive species from being introduced.

Entrance inspection procedures are detailed in the *Official Colorado Watercraft Inspection and Decontamination Procedures: Certified Curriculum for Authorized Agents, 2013*. There is minimal information about entrance inspections in this document. Please refer to the *WID Curriculum* for the complete entrance inspection protocols.

2. Watercraft exiting must be inspected – this is mandatory in Colorado!

Watercraft must get a Standing Water Decontamination if they have features that cannot be drained (e.g. ballast, I/O, Inboard) and intend to launch somewhere different next. Watercraft with suspect or known ANS must get a Full Decontamination (e.g. adult zebra or quagga mussels).

Decontamination Protocols that must be followed by Authorized Agents are detailed in the *Colorado Watercraft Decontamination Manual, 2012*. These procedures are not repeated in this document. Please refer to the *Decontamination Manual* for complete decontamination protocols.

The following is a list of **2013 Containment Authorized Locations** in Colorado:

- Blue Mesa Reservoir - QM
- Grand Lake - ZQM
- Granby Reservoir - QM
- Jumbo Reservoir SWA - QM
- Pueblo State Park - ZQM
- Shadow Mountain Reservoir - QM
- Tarryall Reservoir SWA – QM
- Lathrop State Park – EWM
- Eleven Mile State Park – EWM and NZMS
- Spinney Mountain State Park – NZMS
- Standley Lake - EWM

NOTE: Not all locations positive for EWM or NZMS are implementing containment procedures or have watercraft inspection and decontamination stations.

There are **limiting factors** that may inhibit the ability to implement containment procedures:

1. Ability to control access and direct watercraft to inspection stations through controlled launch and retrieval points at the water body, and effective traffic management (e.g. elimination of shoreline launching, enacting night ramp closures, or traffic patterns that allow retrieval or exiting the water without passing through inspection station)
2. Providing adequate staff and supervision
3. Providing enough water for decontaminations
4. Providing enough fuel (unleaded gas/diesel/propane) for decontaminations
5. Providing the adequate number of decontamination units
6. Providing for waste water containment or disposal, as required
7. Providing for safe traffic management
8. Providing a staging area for boats

Important Notes about Containment Locations:

1. If a boater claimed to be returning to a containment water body and does not, the prevention water body they visit next must decontaminate the boat if they have a ballast tank, an I/O, an Inboard or ANY standing water.
2. There are rare occasions when the weather is unsafe for inspectors to be working (e.g. lightning and hail). During these times boaters can leave containment reservoirs without inspection, draining or decontamination. It is imperative that these boats are intercepted and drained or decontaminated before launching at the next reservoir.

3. There are containment waters in which the access is not controlled. For example, the containment waters within the Arapahoe National Recreation Area (Granby Reservoir, Shadow Mountain Reservoir and Grand Lake) have no ramp closures in place at night when inspectors are not present. Boaters can also launch in the spring before inspectors start (if ice comes off early) and they can launch in the fall after inspections close for the season (if ice comes on late). This is not an ideal situation and it is preferred to have full access control at containment waters. It is the boater's responsibility to clean, drain, dry their watercraft AND get their watercraft inspected before they launch again if they are leaving a containment water body when inspectors are not present. Inspection and possibly decontamination of these watercraft prior to launching at the next water body is imperative.



*Shadow Mountain Reservoir
Photo by Cindi Frank*

STEP BY STEP ENTRANCE INSPECTION WID PROCEDURE

All stations regardless of status (positive, suspect or negative) perform entrance inspections for trailered and motorized watercraft before launching onto the lake or reservoir.

Step 1 - Ensure personal and public safety - You **must** ask the driver to turn off the engine, put on the parking brake and step out of the vehicle.

Step 2 – Greet and Educate the Boater

- Introduce yourself
- Provide a brief verbal explanation of the purpose of inspection
- Provide the boater with a brochure or educational item
- Mention the words Clean, Drain, Dry

Step 3 - Initial Assessment

- Record on the Activity Log or in the Data Collector the following information
 - In or Out
 - Boat Type
 - Boat Registration Number
 - Trailer License Plate
- Check for a Green WID Seal and Receipt - If present, record data on Activity Log or Data Collectors and follow seal protocol as previously described.

Step 4 – Determining Risk Factors

1. Has the boat launched out of state in the last 30 days? If yes, where?
2. Where has the boat launched in state in the last 30 days?
 - Listen carefully and pay attention if any of the locations are positive, suspect or infested.
3. Visually check the watercraft's exterior to determine if it is "dirty, crusty or slimy"
4. Identify if the watercraft is a complex vessel (defined in *Curriculum* as a watercraft that has one or more compartments, or a closed hull, or more than one motor or engine)
5. Visually and physically inspect the watercraft to determine if there is any standing water present.

IMPORTANT: If 2 or more of the above 5 risk factors are true (checkboxes on the log or data collector), and then the watercraft must get a **High Risk Inspection**.

Step 5 – Check for Ballast Tanks

1. If the watercraft has **no seal and receipt**, the tanks should get a standing water decontamination after inspection is completed before allowing launch.
2. If the watercraft has a seal and valid receipt, and **was decontaminated** → thank the boater and allow launch.

3. If the watercraft has a seal and valid receipt, and was not decontaminated, and is from a **prevention** reservoir, have the boater run the ballast pumps and get as much water out as possible → thank the boater and allow launch.
4. If the watercraft has a seal and valid receipt from less than 30 days ago and was not decontaminated, and is from a **containment** reservoir → complete a high-risk inspection and perform a standing water decontamination on ballast tanks. (same is true for I/O and Inboards from containment waters)

Step 6 – Ask About Live Aquatic Bait

- Ask boaters if they have live aquatic bait.
 - a. If yes, follow bait protocol in the *Curriculum Chapter 6*.
 - b. If no, continue with inspection

Step 7 – 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

1. Look over (visual) and feel (tactile) the entire watercraft on both sides of hull and trailer.
2. Physically inspect the through hull fittings.
3. Check trailer bunks or rollers, tire wells, lights and electrical.
4. Remove any plants or plant fragments that are present.
5. Ask the boater to remove the bilge plug when inspecting the transom. Feel the bilge area with and use a flashlight to visually see if any ANS are present.
6. If applicable, have the boater activate the bilge pump.
7. If the watercraft has an inboard engine, be certain to inspect the prop, prop shaft and rudder.

Engine or Motor

1. Ask for the outboard or I/O to be lowered
2. Visually and physically inspect the engine with a flashlight
3. Visually and physically inspect the gimbal area of the outboard or I/O with a flashlight
4. Carefully check the transom or rear of the boat



Anchor and Equipment Checked

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

Drain and Check Interior Compartments

For larger watercraft, you will need to get into the watercraft to inspect interior compartments that could hold standing water (e.g. wells). For smaller watercraft, you may be able to see without entering the watercraft.

1. Ask permission to board the watercraft and ask the boater to climb in first. Follow the boater into the watercraft in the same way they entered. Be careful to prevent either the boater(s) or inspection staff from falling or getting hurt.
2. Ask the boater to open up compartments so you can see all bait wells, live wells, equipment lockers and verifiable ballast tanks.
 - a. 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 cannot be drained, it should get a standing water decontamination.
 - b. Ensure that the compartments are fully drained prior to launch.
3. If the watercraft has an inboard engine, be sure to inspect the engine compartment and bilge.

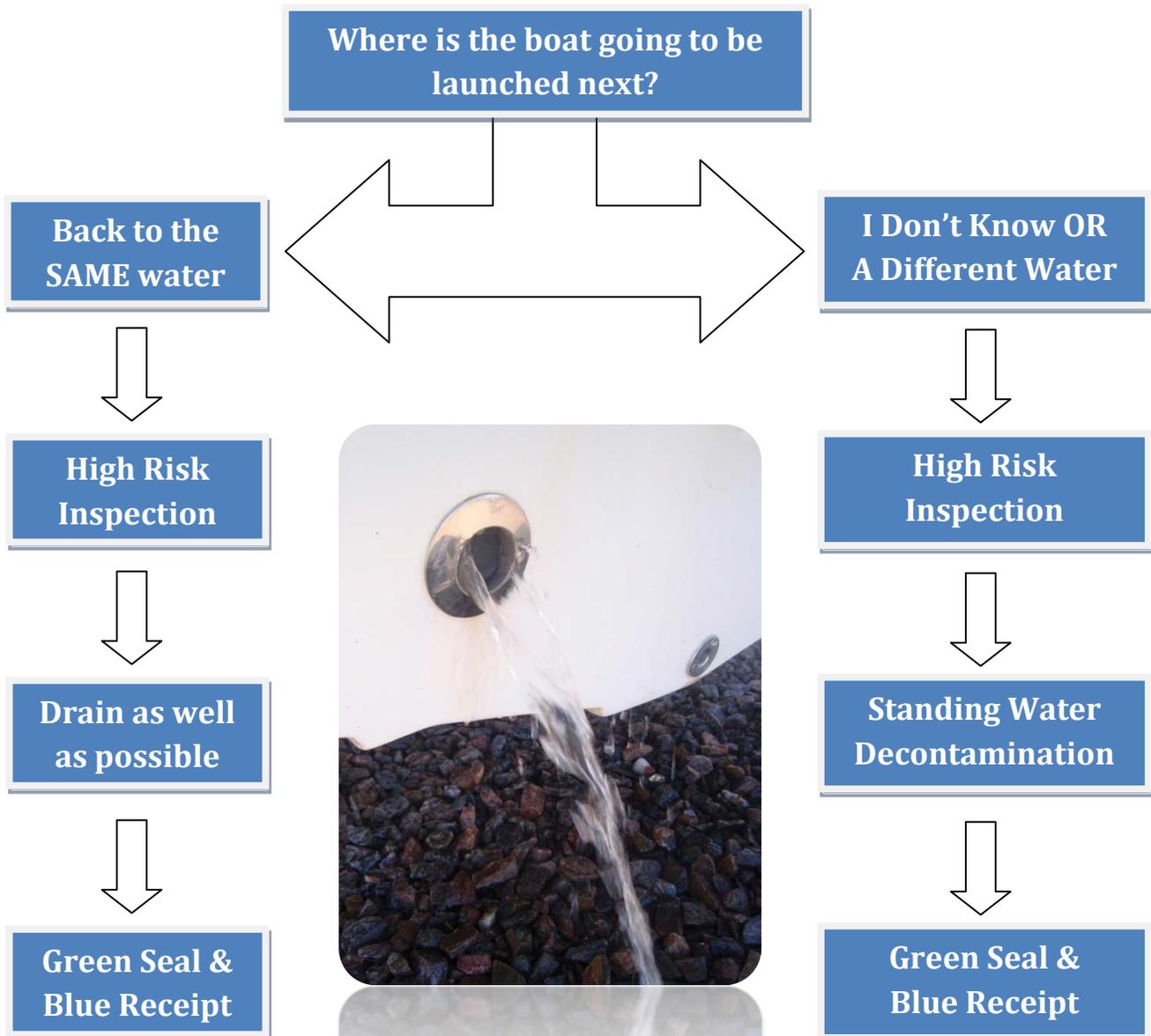
Step 8 - Closeout

1. Remind the boater to replace the bilge plug. The boater is responsible to ensure the watercraft is watertight before launching.
2. Ask the boater to raise the engine or motor to ensure no damage to the motor takes place.
3. Ensure all inspectors are finished looking at the watercraft and that nothing was found.
4. Yell “stand clear” to ensure the safety of staff and the public.
5. Remind the boater to get an exit inspection with a green seal and receipt on the way out to make the inspection process quicker the next time around.
6. Thank the boater for keeping their boat Clean, Drain, and Dry and allow them to launch.
7. Complete the WID Activity Log or submit the Data Collector record.



ZQM VELIGER CONTAINMENT

The goal of Colorado's containment WID procedure is to prevent the spread of water in which invasive mussel veligers have been positively identified to other waters. This is challenging because there are many ways water can be transported in a vessel including: raw water systems, outboard motors, inboard/outboard (I/O) and inboard engines, engine compartments, storage compartments, equipment and gear that has had contact with water, bilge areas, ballast tanks, live wells, bait wells, and any other areas that may potentially hold water. These areas must both be drained and dried with sponges and towels, or get a standing water decontamination. Resources are prioritized on trailered, motorized watercraft (specifically those that cannot be drained) and watercraft that are not returning to the same location. If at any point ANS are suspected or confirmed on watercraft, a full decontamination is required.



STEP BY STEP EXIT INSPECTION W/ID PROCEDURE AT CONTAINMENT LOCATIONS

Exit Inspections are mandatory at Colorado's positive and suspect waters, and is 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. Lastly, it is required to obtain a seal and receipt.

Repeat the primary educational message Clean/Drain/Dry and explain why boaters need to do it each time they use their watercraft. Remind the boater of the negative impacts of zebra and quagga mussels and other ANS.

Step 1 - Ensure personal and public safety

- You **must** ask the driver to turn off the engine, put on the parking brake and step out of the vehicle.

NOTE: Consider putting chocks under the wheels of the vehicle and the trailer. The inspector will have to climb on the watercraft and under the trailer, so it is important to prevent watercraft or trailer from rolling.

Step 2 – Greet and Educate the Boater

- Introduce yourself
- Provide a brief verbal explanation of the purpose of the inspection
- Mention the words Clean, Drain, Dry

Step 3 - Initial Assessment

- Record on the Activity Log the following information
 - "O" for Out/Exiting
 - Boat Type (use key)
 - Boat Registration Number
 - Trailer License Plate

Step 4 – Ask About Live Aquatic Bait

- Ask boaters if they have live aquatic bait.
 - If yes, recommend the boater properly dispose of bait in the trash or follow bait protocol in Chapter 6.
 - If no, continue with inspection

Step 5 - Ask the boater WHERE DO THEY PLAN TO LAUNCH THE BOAT NEXT?

- **If returning to the same location – perform a high risk exit inspection.**
- **If not planning to return – perform a high risk exit inspection and follow standing water decontamination procedures.**

Step 6 – Check for Ballast Tanks

- If the boater is going to launch at the same location next, the protocol is to have the boater run the ballast pump(s) as long as it takes until no more water comes out of the ballast tank(s).
- If the boater is planning to launch at a DIFFERENT location next, the ballast tanks must get a standing water decontamination.

Step 7 – Perform the visual and tactile inspection of the watercraft, using the acronym HEAD to ensure that all high risk portions of the watercraft are inspected.

Hull and Trailer – Exterior Inspection

- Look over the entire watercraft on both sides of hull and trailer.
- Physically inspect the through hull fittings.
- Check the 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 when inspecting the transom. If applicable, have the boater activate the bilge pump.
- If the watercraft has an inboard engine, be certain to inspect the prop, prop shaft and rudder.

Engine or Motor

- Ask for the outboard or I/O to be lowered twice.
- Check engine compartments with a flashlight.
- Check the gimbal area of the outboard or I/O with a flashlight.
- Carefully check the transom or rear of the watercraft.

Anchor and Equipment Checked

- Ask to see the anchor and anchor rope or chain.
- Visually and physically inspect the anchor and rope/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

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

- Ask for permission to board the watercraft and ask the boater to climb in first. Follow the boater into the watercraft in the same way they entered. Be careful to prevent either the boater(s) or inspection staff from falling or getting hurt.
- 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 fully drained to the best of your ability.

- If the watercraft has an inboard engine, be sure to inspect the engine compartment and its bilge and run bilge pump, if applicable.

NOTE: If the watercraft cannot be drained, and is not planning to return, it must get a standing water decontamination.

Step 8 – Apply Seal and Provide Valid BLUE Receipt

- Properly apply a green seal to watercraft and trailer
- Hand the boater a copy of the green seal receipt and blue receipt
- Explain that the seal is valid only if the receipt is present and the seal is intact

Step 9 - Closeout

- Ask boater to leave the bilge plug out during transport to ensure extra drain/dry time
- Ask boater to raise the engine or motor to ensure no damage takes place
- Ensure all inspectors are finished looking at the watercraft and that nothing was found
- Thank the boater and remind them the importance of Clean, Drain, and Dry

Step 10 - Complete the WID Activity Log or submit the Data Collector record



Exiting watercraft at containment reservoirs gets a minimum of a **High Risk Inspection** upon exit. A high-risk inspection should be a thorough and complete visual and tactile inspection of all portions of the watercraft, trailer, and any of the equipment or gear, ropes, or anchors. The time it will take to complete a High Risk Inspection may vary greatly depending on the type and complexity of the watercraft.

- Feel the entire hull, trailer and transom below the water line focusing on right angles and fasteners.
- Be extremely thorough with engine/motor and gimbal inspection using a flashlight and your hands.
- Inspect all equipment that is exposed to water in interior compartments.
- Ensure all water is drained (if returning) or perform a standing water decontamination (if not returning).

If sandpapery bumps, mussels, or other suspect ANS are detected on the watercraft, a full decontamination is required.



WID RULES FOR STANDING WATER

Microscopic zebra and quagga mussel veligers are capable of surviving up to 27 days in closed wet interior compartments (Myrick, 2012). It cannot be overstated how important it is 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. You must pay careful attention to all trailered watercraft that cannot be completely drained and therefore, contain standing water.

There are two types of water on watercraft:

Verifiable Water – This is water in compartments that you can see, feel or visually inspect, such as in wells or bilges. This is most of the water on most on the watercrafts you will encounter.

Unverifiable Water – This is water in compartments (e.g. ballast tanks) that you cannot see, feel or visually inspect.

Rule #1 – Watercraft from Containment Reservoirs that have NOT been decontaminated

If the watercraft has been in suspect, positive or infested waters in the last 30 days and has any standing water, it is mandatory to send the watercraft to decontamination.

Even in cases where watercraft has an engine (I/O or Inboard) or a ballast tank that cannot be drained completely, 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 and from unknown sources, or from prevention waters must be clean, drained and dry. Sponge, pump or towel out standing water, or decontaminate, prior to allowing launch.

Rule #3 – Watercraft with Unverifiable Water

Sealed boats with receipts returning to the same location do not need decontamination.

Sealed ballast boats with receipts moving between Colorado **prevention** locations must be fully pumped out and do not require decontamination in between launches.

Undocumented boats (no green seal and receipt) will get a mandatory standing water decontamination (I/O, Inboard, Ballast).

ADULT ZQM CONTAINMENT

While there has never been an adult zebra or quagga mussel found in a Colorado water body, it is imperative that procedures are developed in the event rapid response is necessary in the future. In other states where ZQM positive or infested waters exist, it is critical for the protection of all waters, facilities and people in the West, that adult mussels do not leave attached to watercraft.

Inspectors working at waters where adult mussel(s) have been detected must follow the same Step-By-Step Exit Inspection Procedures for containment as veliger-detected waters. This will prevent watercraft from transporting veligers in standing water, in addition to ensuring settlers and adult mussels do not leave attached to watercraft.

Remember, the ANS Law (SB08-226) and Regulations (Parks-8-801) prohibits the possession and transportation of zebra or quagga mussels, or other listed ANS. Therefore, it is a core value within Colorado's WID Program that watercraft with suspected or known ZQM or ANS must get a full decontamination.

#801 – POSSESSIONS OF AQUATIC NUISANCE SPECIES

*Except as provided in these regulations or authorized by the Divisions or under Title 33 or Title 35 C.R.S., **it shall be unlawful for any person to possess, import, export, ship, transport, release, place, plant, or cause to be released, placed, or planted into the waters of the state any aquatic nuisance species.***

If a water body is positive for adult mussels, but there is no confirmation of an established population, it is plausible that there will be very few, if any, watercraft exiting with adult mussels attached initially. The WID procedures for veliger containment will continue to be operationally feasible. As the invasive population advances, there will eventually be an increase in watercraft exiting with adult mussels attached needing a full decontamination. Decontaminating watercraft for adult mussels is much more expensive, difficult and labor intensive, than flushing standing water out of watercraft to stop the transportation of veligers.



Quagga mussels at Lake Pleasant, AZ

INFESTED ZQM CONTAINMENT

Infested bodies of water are those in which a zebra or quagga mussel population is established. The invasive mussel population has multiple age classes, is reproducing and recruiting. Mussels may be visible at the water body. Mussels have been observed attached to boats.

Containment at infested waters is the most difficult, costly and imperfect of all containment scenarios. As populations of ZQM advance and explode, the demands of the containment WID station increases exponentially. Operational feasibility and fiscal resources will have ultimate influence over the ability to implement WID procedures at infested water bodies.

The volume of infested boats that will need a full decontamination will increase over time. WID stations must be prepared to perform a full decontamination on a large percentage of complex watercraft leaving the water body. Traffic flow, staffing volume, decontamination equipment, wastewater containment and all other operational facets will have to be bolstered in order to implement WID procedures.

Implementing Containment WID Procedures means performing a high risk inspection on every trailered, motorized watercraft entering and exiting, and perform a standing water decontamination on those that can't be drained, and performing a full decontaminations for those that have adult mussels or other ANS attached.

Difficulty implementing WID procedures occurs when the volume of complex watercraft, compounded with adult mussel attachment, exceeds the operational and fiscal capacities of a WID station. Stations at waterbodies with a lower volume of watercraft use, and low risk simpler watercraft, are able to inspect and decontaminate more boats on exit than those WID stations at waterbodies with high volume watercraft use and high risk complex watercraft. Waterbodies with developed infrastructure and existing utilities also have a greater capacity to mitigate limitations for inspection and decontamination than rustic stations.

Establishing **public-private partnerships** is very important when implementing any WIDS!

- Marine dealers, service centers and marinas offer an unparalleled connection to educate and inform boaters.
- Marinas are often the recipient of commercially hauled watercraft and they offer opportunities for complex watercraft to remain on the water for long periods.
- Infested mussel boats often need to be serviced by a trained marine mechanic. Watercraft with infested interior compartments and engines may need service by a professional to restore functionality.

MAXIMIZING RISK REDUCTION AT INFESTED WATERS WHEN RESOURCES ARE INADEQUATE TO IMPLEMENT CONTAINMENT WID PROCEDURES

When fiscal resources are not adequate to implement containment WID procedures at infested waters, it is imperative to mitigate the potential for watercraft to move adult mussels to negative waters to the greatest extent possible.

THE BARE MINIMUM

The minimum management response to a verified ANS detection is to install signage at suspect, positive or infested waters to alert users and educate them to clean, drain and dry. Managers should utilize existing agency personnel to inform boaters to take extra precautions to clean and drain their watercraft after boating in infested waters.

Boater education becomes even more critical when resources to implement WID procedures are inadequate at infested waters. Engaging watercraft owners to voluntarily self-inspect and/or self-quarantine to stop the spread of ANS to new waters is top priority.

Managers can also mandate boaters self-inspect and/or self-quarantine (utilize a drying time) their watercraft after boating in containment waters. It is very difficult to maintain quality and enforce this approach, but it does provide minimal risk reduction because some boaters will comply once educated.

Drying Time

The following are the dry times depending on the temperature as determined by the Western Regional Panel (WRP) on the 100th Meridian Quarantine Time Estimator (<http://100thmeridian.org/emersion.asp>).

Maximum daily temperature (Fahrenheit)	Minimum days out of water
<30	3
30-40	28
40-60	30
60-80	14
80-100	7
>100	3

NOTE: Add 7 days for temps ranging from 30-100 degrees F if relative humidity exceeds 50%.

USING EXPOSURE BASED RISK TO PRIORITIZE WATERCRAFT INSPECTION AND DECONTAMINATION

At highly infested water bodies that experience a very high volume of complex watercraft use, resources may be inadequate to implement WID Procedures due to the large amount of complex watercraft needing full decontamination.

The Colorado WID procedures for veliger and adult ZQM containment already account for minimal levels of risk acceptance by allowing returning boaters to leave and return to the same place without decontamination, and exempting hand-launched watercraft from inspection.

To achieve minimal to moderate risk reduction, managers should consider implementing WID procedures on the highest risk watercraft. This approach prioritizes exit inspections and decontaminations on those with the greatest exposure to the infestation (e.g. length of time on the water body).

On the following page, there is a spectrum of containment options for consideration at infested WID locations. The intent of the *Infested Waters Containment Spectrum* is to provide prioritized options to implement containment WID procedures at infested sites with limited resources. It has been documented that watercraft that has a longer exposure to mussels are at a higher risk of transporting adult mussels. Watercraft that have been moored on the water pose a greater risk than those that have not.

- The spectrum begins at the bare minimum response, which requires almost no resources being allocated to education, self-inspection and self-drying time.
- At the lowest resource levels, WID Procedures are implemented on only the highest priority watercraft based on exposure – those on the water more than 7 days, more than 3 days or overnight.
- To provide greater containment efficacy, staff should inspect all trailered and motorized watercraft on exit, including day use customers. This is the Colorado WID Procedure.
- The ideal and most costly option is to inspect all watercraft coming and going with no exceptions.

As resources become available, and new partnerships formed, implementation can expand from the minimum to the ideal.



Infested Waters WID Containment Spectrum

Minimum
\$



- Post Signage Alerting Public
- Educate Users to Clean, Drain, Dry



- Implement Mandatory or Voluntary Self-Inspection
- Implement Mandatory or Voluntary Drying Time

\$\$



- Mandatory Inspections for Watercraft Moored **7** days or longer. Follow Containment Exit WID Procedure.



- Mandatory Inspections for Watercraft Moored **3** days or longer. Follow Containment Exit WID Procedure.

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- Mandatory Inspections for Watercraft Moored **overnight** or longer. Follow Containment Exit WID Procedure.



- Mandatory Inspections for all trailered or motorized watercraft exiting. Follow Containment Exit WID Procedure.

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- Mandatory Inspections for all trailered or motorized watercraft entering and exiting. Follow WID Procedures.



- Mandatory Inspections for all watercraft exiting, including hand-launch. Follow Containment Exit WID Procedure.

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Maximum
Ideal



- Mandatory Inspections for all watercraft entering and exiting, including hand-launch. Follow WID Procedures.

A GEOGRAPHIC APPROACH TO CONTAINING MULTIPLE WATERS IN CLOSE PROXIMITY

Scale is an important consideration when implementing containment measures, especially for highly infested water bodies in close proximity or with a high percentage of shared users. In some cases where there is only one infested water body in a given geographic area, the best place to implement the containment program is right at that water access points (e.g. Pueblo Reservoir State Park). In other cases, implementing a roadside containment system to reduce the number of contaminated watercraft leaving a group of containment water bodies may be a more efficient approach.

The 100th Meridian Initiative was founded on the principal of creating a broad geographic boundary to contain zebra and quagga mussels to (east of the meridian) and prevent their introduction to (west of the meridian) through education. A similar approach using WID locations could be implemented to create a multi-state geographic boundary to protect negative waters from eastern and southwestern infested waters. Standard training, procedures and quality control measures would need to be enacted as well.

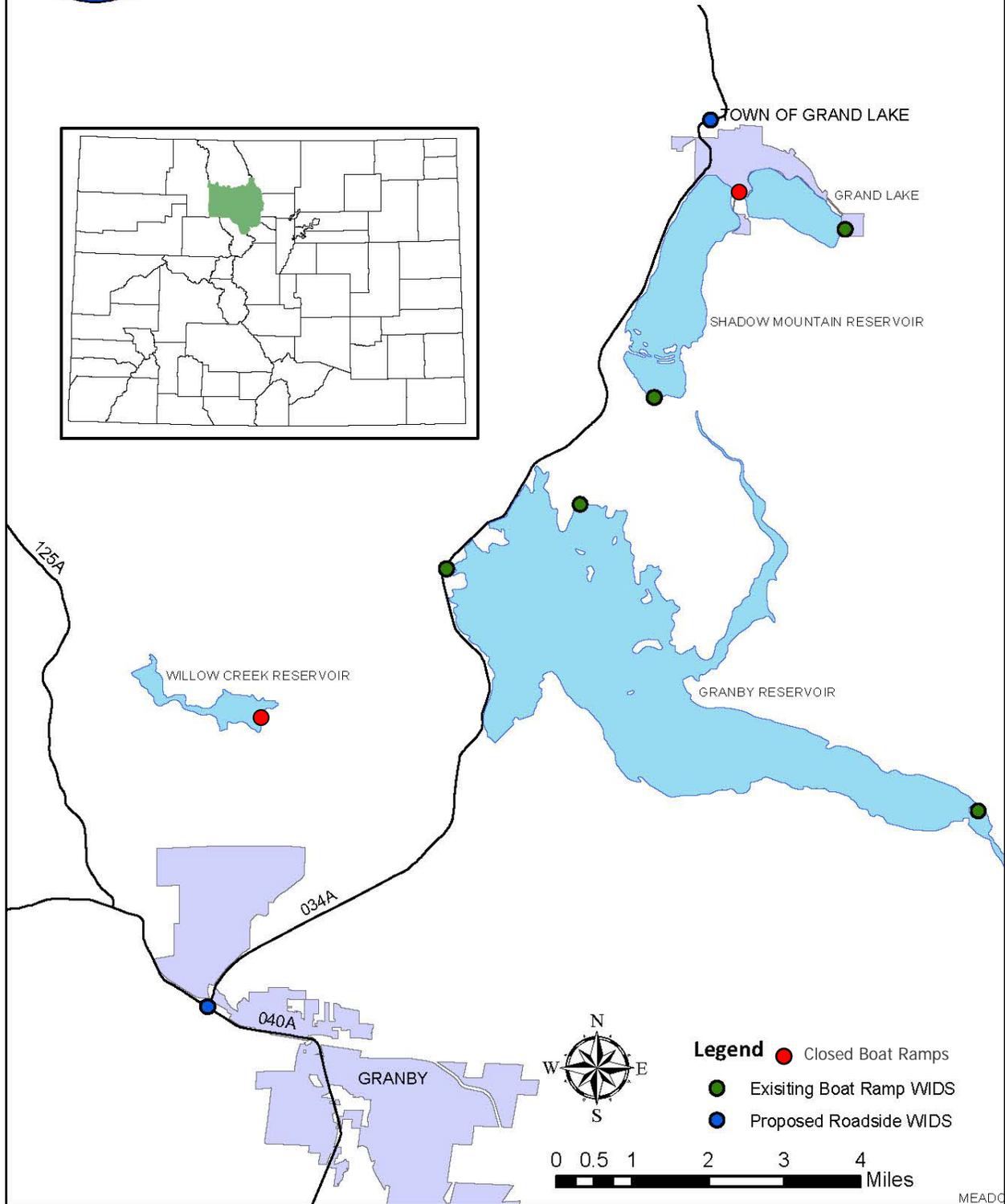
Shifting resources from water body access points (e.g. ramps) to outside infestation boundaries (e.g. roadside stations) may be a more cost-effective method of implementing WID procedures for containment within areas that have multiple positive or infested water bodies within close proximity to each other. This approach would require a multi-jurisdictional partnership and law enforcement commitment to implement. A benefit would be that boaters could move between the infested waters without consuming WID resources, but would be required to submit to inspection and decontamination when moving towards negative waters.

Similarly, many very large reservoirs cross jurisdictional boundaries including private, city, county, state, tribal, and federal agencies. Some of these also have private boat launches, in addition to shoreline launching sites. In these instances, setting up boat inspection and decontamination checkpoints at roadside points may provide for better containment.

The containment reservoirs for veligers in Grand County, Colorado might be a candidate for a shift to this approach in the future (see map on the next page). Capital construction would need to take place to build the roadside stations, and there would have to be commitment from law enforcement personnel to staff the stations alongside inspectors. However, this shift would allow managers to operate two highway checkpoints, instead of the current system of operating stations at five public ramps and two closed public ramps. A secondary benefit is that the public could regain full access to the closed portions of the four reservoirs.



Grand County Containment WIDS: Existing Boat Ramp WIDS and Proposed Roadside WIDS



MEADCO

OTHER ANS CONTAINMENT

EURASIAN WATERMILFOIL (EWM) & AQUATIC WEEDS

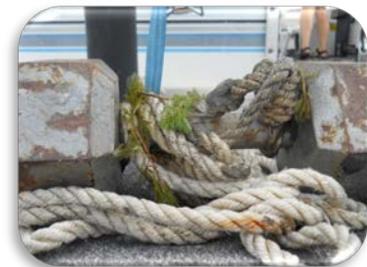


Eurasian Watermilfoil (EWM) is an aquatic noxious weed that is present in Eastern Colorado and neighboring states. Removing plants from the trailer or watercraft is a part of every entrance and exit inspection. Plants should not be transported on watercraft or conveyances.

EWM and many other aquatic plants spread by fragments, seeds and winter buds. These aquatic weeds usually form dense mats that restrict swimming, fishing, and boating, and clot water intakes. They 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. They create standing water in ditches and canals, providing ideal mosquito habitat leading to an increase in mosquito borne illnesses, such as West Nile Virus.

WID Procedures for EWM Containment:

- High risk exit inspection focusing on the exterior of the boat including trailer bunks, propellers, intakes and any other areas where aquatic plants may be stuck or attached. All plant material must be physically removed.
- If plant fragments cannot be physically removed, perform a plant decontamination.



**OTHER ANS CONTAINMENT –
NEW ZEALAND MUDSNAILS (NZMS)**

Watercraft inspectors have detected NZMS on boats moving into and out of Colorado’s reservoirs!

Mudsnails are able to close their shells to withstand dry conditions and a variety of temperatures. If embedded in mud, they can survive 30 days in dry mud and 50 days in moist mud.

They can reproduce asexually; it only takes one to start an entirely new population. As with ZQM, eradicating established infestations is impossible.

By following Colorado WID Procedures [no mud, no plants, no water, and no mussels] the movement of New Zealand mudsnails on watercraft can be stopped by following the WID procedures, and educating anglers. If boaters and anglers practice Clean, Drain, Dry, the movement of invasives can be stopped!

Wader cleaning stations are an effective tool available for containment of NZMS that is currently being used in western states and evaluated for use in Colorado.

Angler Recommendations (for those with no boats):

Keep all angling gear free of mud, plants, and organic debris in between each and every use. Unknowingly moving a species from one body of water to another, even within different stretches of the same river, can start a domino effect of invasion, causing irreversible ecological damage. It is especially important to keep waders clean.

Anglers should scrub the bottom of boots or waders with a brush and remove all mud, plants, and organic materials in between each and every use. Anglers should then perform **ONE** of the following options before going into the next body of water:



Angler Alert!
New Zealand Mud Snails
have been found in the South
Delaney Buttes Reservoir.

Anglers who use waders in NZMS infested waters should **CLEAN** waders and gear with a wire brush and remove all mud, plants and organic materials **between each and every use**.

Anglers should then **DISINFECT** waders and gear using one of these options **before going back into the water:**

OPTION 1

- Mix 50% Water & 50% Formula 409®
- Submerge waders and gear for 10+ minutes.
- Scrub debris & inspect for snails before rinsing.
- Rinse water must be free from New Zealand mud snails (to avoid re-infection).
- Dispose away from any body of water.

OPTION 2

- Mix 1 part Sparquat 256 cleaner (3.1% concentration) to 15 parts water.
- Submerge waders and gear for 10+ minutes.
- Scrub debris & inspect for snails before rinsing.
- Rinse water must be free from New Zealand mud snails (to avoid re-infection).
- Dispose away from any body of water.

OPTION 3

- Spray or soak waders and gear for 10+ minutes.
- Make sure water is 140°F.

OPTION 4

- Let waders and gear completely dry for 10+ days between each use (mudsnails can survive several days out of water).

OPTION 5

- Place waders and gear in a freezer overnight between each use.

**Boaters: Remove all mud, plants and water from your vessel.
CLEAN • DRAIN • DRY between each and every use.**

You can prevent the spread of NZMS and other invasive species to other waters!

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OPTION 1 - Spray or soak waders and gear with 140° Fahrenheit water for at least 10 minutes.

OPTION 2 - Place waders and boots in a freezer overnight between uses.

OPTION 3 - Dry your waders and equipment completely for a minimum of 10 days between use.

OPTION 4 - Submerge waders and gear in a large tub filled with a mixture of 6 ounces per gallon quaternary ammonia-based institutional cleaner (such as Super HDQ Neutral) and water for at least 10 minutes, scrubbing debris from the gear, and visually inspecting the gear for snails before rinsing. Follow all precautionary label instructions! Rinse water must be from a New Zealand mudsnail-free source (to avoid re-infection), and the chemical bath must be properly disposed of, away from the water body.

WID Procedures for NZMS Containment:

- High risk exit inspection focusing on the exterior of the boat and any mud or algae on the hull or trailer, carpeted areas, intakes and compartments that may hold standing water.
- If NZMS are discovered, remove snails by hand if possible and perform a full decontamination exposing the snails to 140° Fahrenheit water for at least 10 minutes.

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NEW ZEALAND MUDSNAIL
PHOTO TAKEN BY
RICHIE HAIN DEPARTMENT OF
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OTHER ANS CONTAINMENT – RUSTY CRAYFISH

Rusty crayfish are native to the Ohio River Basin. They were most likely introduced as bait or illegally stocked as prey for fish. These crayfish eat small fish, insects, and fish eggs. They also eat aquatic vegetation, damaging underwater habitat important for fish spawning, cover, and food. They are very aggressive and displace or eliminate native crayfish. Invasive crayfish can have inordinately large effects on native aquatic species due to their complex role in food webs as prey and their polytrophic feeding habits (Kerby et al., 2005; Usio et al., 2006; Ilheu et al., 2007). Because crayfish are generally larger, longer lived, and more mobile than most other invertebrates in a given ecosystem, these crustaceans can greatly affect the systems they inhabit (Lorman and Magnuson, 1978; Momot, 1995).

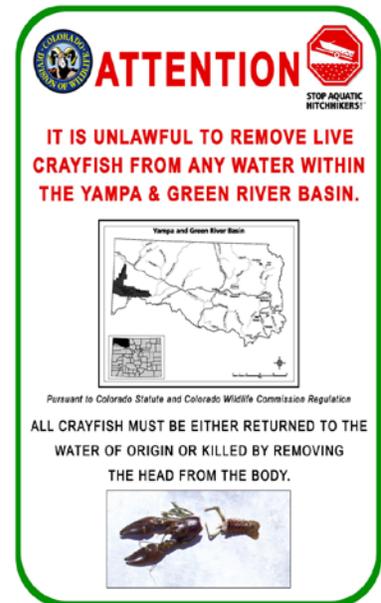
The rusty crayfish was believed to be established in only one site west of the Continental Divide in Washington (Olden et al., 2009), however, rusty crayfish now occur in the upper Yampa River within and below Catamount Reservoir (2009), in Sanchez Reservoir (2010) and in Stagecoach Reservoir (2011). A trained boat inspector discovered the population of rusty crayfish at Sanchez Reservoir State Wildlife Area. It is common for boat inspectors to see crayfish being used as bait, harvested for bait or harvested for human consumption.

Rapid response to rusty crayfish in Colorado included a regulation to prohibit the live transport of invasive crayfish:

- Live transport of crayfish west of the Continental Divide is prohibited. All crayfish caught west of the Continental Divide must be immediately killed by removing the head from the thorax and taken into possession, or immediately returned to the water from which they were taken.
- The CPW has issued an order that prevents the transport of any live crayfish from Sanchez Reservoir SWA.

WID Procedures for Rusty Crayfish Containment:

- Always ask about live aquatic bait when performing entrance and exit inspections, even if the boater has a green seal and receipt.
- If crayfish are discovered during an inspection, ask for a receipt and follow bait procedures.



OTHER ANS CONTAINMENT - WATERFLEAS

Spiny and fishhook waterfleas are small predacious crustaceans that are zooplankton. Similar to ZQM, both arrived in ship's ballast water from Eurasia.

Waterfleas can reproduce sexually or asexually. They can spread to inland waters when recreational gear is contaminated with egg-laden females. When females die out of water, under certain conditions they produce eggs that resist freezing and drying, and can remain viable. Laid eggs in the benthic zone of lake or reservoir can remain viable for years and hatch when conditions are optimal. Under certain conditions, waterfleas can establish a new generation within two weeks. Eradicating established infestations is impossible.

Presently, the best defense against waterfleas is to prevent their transfer to new waterbodies through the current WID procedures. Waterflea eggs and adults can get into bilge water, bait buckets, live wells and coat fishing lines when boating or fishing in infested waters.

WID Procedures for Waterflea Containment:

- High risk inspection, with a focus on equipment, fishing tackle and nets; and remove any visible plants or animals.
- Drain water from all compartments and motor/engines.
- Standing water decontamination for compartments that cannot drained (e.g. ballast).
- Bait treatment for live aquatic bait, if applicable.
- Full decontamination of boat and equipment if waterflea or other ANS are found on the watercraft or trailer.

CONCLUSION

In an effort to protect Colorado and regional water bodies, implementation of containment WID procedures to stop the spread of ANS is among the highest priority of the Colorado Invasive Species and ANS Programs. This document not only outlines Colorado's containment strategy, but is intended to provide options to other managers seeking to respond rapidly to a verified detection and stop the spread of ANS overland on watercraft. Managers should consider the options outlined in the *Infested Waters Containment Spectrum* and *Geographic Approach* when implementing WID at infested waters with minimal resources.

A comprehensive WID containment program should include entrance and exit inspections on trailered, motorized watercraft. A complementary strong education and information campaign is a high priority for prevention and containment. Monitoring and enforcement are also crucial portions of implementing any WID program.

When conducting exit inspections at positive or infested waters, there are five key points for managers and inspectors at containment locations to remember:

1. All boats exiting need to have a high risk inspection.
2. All boats exiting need to be fully drained.
3. If the boater is not returning or is unsure where they are going next, then a standing water decontamination is required for motors and engines, and compartments that cannot be drained (e.g. ballast tank, I/O, Inboards, etc.).
4. If adult mussels are found attached to a boat, a full decontamination is required.
5. A green seal and receipt must be applied to all boats leaving containment locations, in addition to being documented on the WID Activity Log or Data Collectors.



A quagga mussel infested gimbal unit

With growing regional and national communication, support and partnerships, the future of zebra and quagga mussel containment and prevention in the West continues to evolve and shows promise for a coordinated future strategy.

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