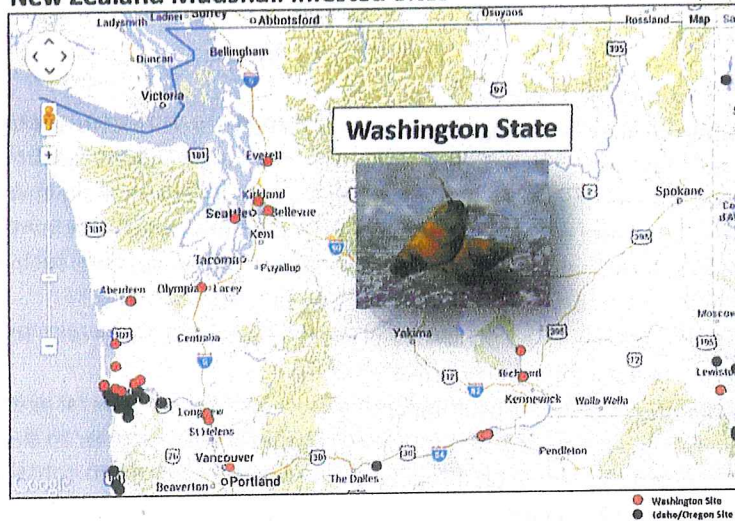


Washington Department of Fish and Wildlife

2015 New Zealand Mudsnail (NZMS) Statewide Action Summary

The Washington Department of Fish and Wildlife (WDFW) is the lead state agency for the management of New Zealand Mudsnails (NZMS), which are classified as a "prohibited level 3 species" under RCW 77.135.030(1)(c). This classification is for non-native animal species that "pose a moderate to high invasive risk and may be appropriate for prevention, rapid response, or other prohibited species management plan actions by the department, another agency, a local government, tribes, or the public." Under RCW 77.135.040(1), prohibited species "may not be possessed, introduced on or into a water body or property, or trafficked, without department authorization, a permit, or as otherwise provided by rule."

New Zealand Mudsnail Infested Sites

The primary statewide management efforts for NZMS are incorporated into WDFW's overall aquatic invasive species (AIS) prevention program actions. These include signage at water bodies and boat launches, field gear decontamination protocol development and trainings, and education/outreach to the public. In situations where a NZMS infested site is newly discovered, WDFW provides consultation, coordination, and support to local jurisdictions and interested parties on management options including prevention, containment, control, and eradication. As resources allow, WDFW has contributed to additional containment, control, eradication planning, and monitoring actions. In general, the burden of infested site management of prohibited level 3 species is that of the water/land owner or manager.

NZMS are classified as prohibited because they meet the definition of "invasive species" under RCW 77.135.010(13) and pose an invasive risk of harming or threatening the state's environmental, economic, or human resources. NZMS feed on the primary food web of algae and detritus important to native aquatic insects. Reductions in native aquatic insects in turn threaten the huge environmental and economic investment our state continues to spend on salmon recovery efforts as those insects are critical as feed to juvenile salmonids. NZMS are not an alternative food source as they have very low nutritional value and most pass through a fish's digestive track unharmed. In addition, NZMS are relatively recent invaders to the United States (original detection in Idaho around 1987) and their potential invasive harm continues to evolve with each new location in which they become established, developing relationships with other invasive species, and the effects of climate change.

NZMS invasive history in Washington State goes back to 2002 with their discovery in the Lower Columbia River estuary and most recently in 2014 at a WDFW fish hatchery on the Columbia River in

Eastern Washington. The number of infested sites in the state is still relatively low (~15 areas) and increased awareness and management actions have contributed to preventing rapid and extensive spread. The following summary of infested sites provides an overview of these actions.

Summary Key

Status/Management Actions:

- "Prevention" means management actions taken to stop or attempt to stop the introduction of an aquatic invasive species into the state or into an uninfested water body or property within the state.
- "Control" means to reduce or attempt to reduce the risk of an invasive species from spreading beyond a property or water body through reductions in the species' population size; or applying a treatment to mitigate against the effects of an invasive species, such as coatings that minimize attachment to an object, or fencing to protect a sensitive area.
- "Containment" means to physically prevent or attempt to prevent an invasive species from spreading beyond a property or water body.
- "Coordination" means consulting with affected state and federal agencies, tribes, local governments, and private water body or property owners prior to support mutual assistance and cooperation in providing an effective and efficient response to contain, control, and eradicate the targeted invasive species.
- "Eradication" means, to the extent technically and measurably possible, to kill, destroy, remove, or otherwise eliminate an invasive species from a water body or property using physical, chemical, or other methods.
- "Rapid response" means expedited management actions triggered when a prohibited level 1 species is detected, for the time-sensitive purpose of containing or eradicating the species before it spreads or becomes further established.
- "Monitoring" means systematically collecting and analyzing AIS population data over time to evaluate risks and management effectiveness. This component is not currently funded at this time.

Density:

- "Low" means 1 to 100 NZMS per square meter density.
- "Moderate" means 101- 10,000 per square meter density.
- "High" means > 10,000 per square meter density.

NZMS Infested Site Management Summary

Lower Columbia River (2002)

Status: Prevention

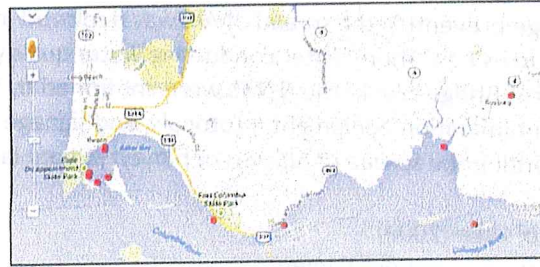
Density: Moderate/High

Lead: WDFW

Partners: Washington State Parks (WSP), United States Fish and Wildlife Service (USFWS), United States Coast Guard (USCG), University of Washington (UW), Oregon State University (OSU), and Portland State University (PSU)

Management Actions: Prevention

Summary: USFWS and USCG funded a lower Columbia River AIS survey conducted by UW, OSU, and PSU 2001 – 2004. NZMS were detected in several areas from Cape Disappointment State Park, Ilwaco, Fort Columbia Park, Megler Rest Area, and at the mouth of Grays River. WDFW has not confirmed the detections. Signage preventing the spread of AIS was deployed at boat launches in the general area.



Willapa Bay Area (2014)

Status: Prevention

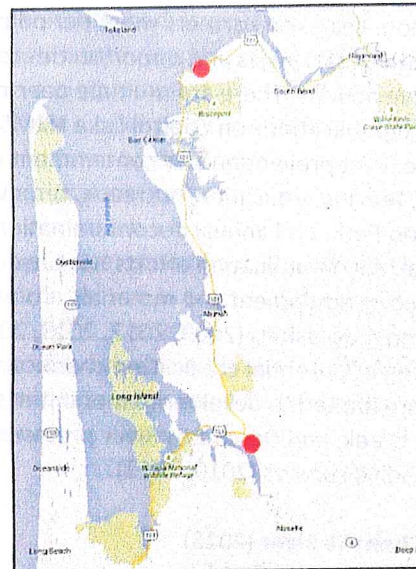
Density: Moderate/High

Lead: Washington State Department of Transportation (WSDOT)

Partners: WDFW

Management Actions: Coordination and prevention

Summary: WSDOT staff conducting routine beaver dam removal detected NZMS February along SR 4 near Naselle, Washington. The NZMS were confirmed by an independent mollusk expert and WDFW. WDFW conducted a meeting of local stakeholders to discuss NZMS invasive risks and further response options. Decontamination equipment, protocols, and signage was distributed to stakeholders. Signage preventing the spread of AIS was deployed at boat launches in the general area. WSDOT staff detected another NZMS infestation May along US 101 near South Bend, WA. WDFW confirmed and documented the new infestation.



Kalama/Vancouver Area (2002, 2013)

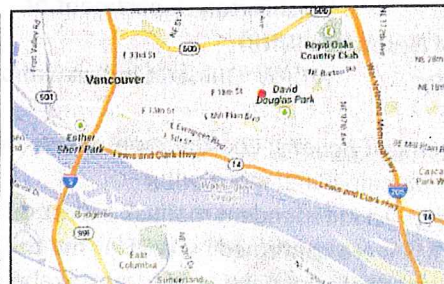
Status: Prevention

Density: Moderate

Lead: WDFW

Partners: USFWS, USCG, UW, OSU, PSU, and Water Resources Education Center

Management Actions: Prevention



Summary: USFWS and USCG funded a lower Columbia River AIS survey conducted by UW, OSU, and PSU 2001 – 2004. NZMS were detected 2002 near Kalama, WA. WDFW has not confirmed the detections. Signage preventing the spread of AIS was deployed at boat launches in the general area. Water Resources Education Center conducting water quality monitoring in urban streams detected NZMS 2013 in Burnt Bridge Creek. The NZMS were confirmed by WDFW and an independent mollusk expert. Decontamination equipment, protocols, and signage was distributed to WDFW Region 5 staff. Signage preventing the spread of AIS was deployed at boat launches in the general area

Capitol Lake (2009)

Status: Containment

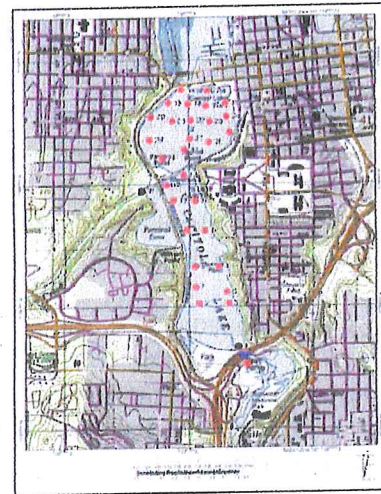
Density: Moderate/High

Lead: Washington Department of Enterprise Services (DES)

Partners: WDFW, RCO/WISC, DOE, City of Olympia, Squaxin Island Tribe, USFWS

Management Actions: Coordination, prevention, containment, rapid response, control, eradication planning, and monitoring.

Summary: Capitol Lake is closed to the public to contain the infestation. Lead and partners meet periodically to discuss ongoing management strategies and opportunities to implement or fund more aggressive actions. There are multiple peer-reviewed and grey literature publications on Capitol Lake NZMS management actions available. Past prevention and containment efforts have included signage, fencing, education/outreach, removal of the dock at Marathon Park, and annual decontamination services at Rotary "Duck Dash" events. Rapid response/decontamination efforts have included: multiple decontaminations of vehicles, boats, construction equipment and materials. Control efforts have included: lake draw-down and freeze actions on 4 occasions (2009, 2012, 2013, 2014); a lake draw-down and marine water backflush (2010); lab testing of potential eradication chemicals and investigation of permitting requirements. Eradication efforts are limited to development of initial scoping and costs. Monitoring efforts include: Lake basin, Percival Creek, and Deschutes River presence/absence surveys (2010 formal, informal annual); and two 5-mile radius surveys (2010, 2013).



Lower Chehalis River (2013)

Status: Prevention

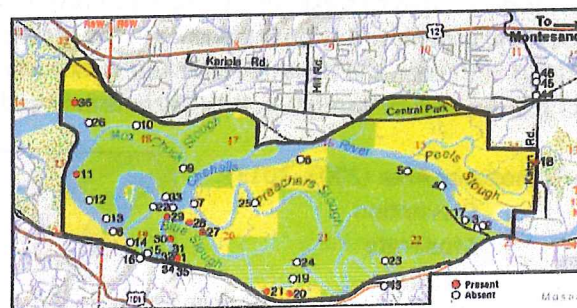
Density: Low

Lead: Washington Department of Natural Resources (DNR)

Partners: WDFW, Quinault Indian Nation, USFWS,

Management Actions: Coordination, prevention, control planning, and monitoring

Summary: An independent mollusk expert detected NZMS at the WDNR Blue Slough Access area July. The NZMS were confirmed by WDFW and the independent mollusk expert that detected the NZMS. WDFW conducted a meeting of local stakeholders to discuss NZMS invasive risks and further response options. Decontamination equipment, protocols, and signage was distributed to stakeholders. Signage preventing the spread of AIS was deployed at boat launches in the general area. DNR conducted a presence/absence NZMS survey of the general and detected NZMS in Preachers Slough.

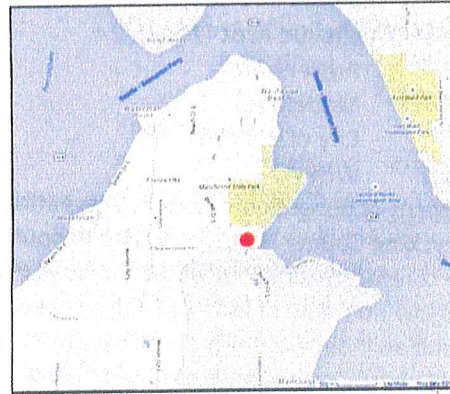


NOAA Manchester (2014)

Status: Containment
Density: Moderate/High
Lead: NOAA
Partners: WDFW

Management Actions: Coordination, prevention, control, and eradication planning

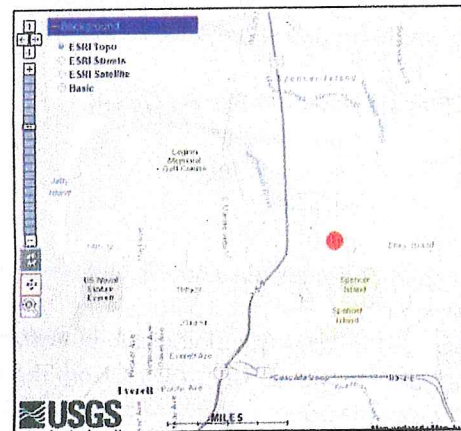
Summary: A Washington University professor touring the NOAA Manchester facility detected NZMS in the artificial stream March. The NZMS were confirmed by WDFW and an independent mollusk expert. WDFW conducted a visual survey of facility and detected NZMS in a ditch below the artificial stream. WDFW conducted a meeting with NOAA staff to discuss NZMS invasive risks and further response options. Decontamination equipment, protocols, and signage was offered to NOAA staff. Unknown if NOAA has decontaminated the artificial stream.

**Snohomish Estuary (2013)**

Status: Prevention
Density: Moderate
Lead: WDFW
Partners: Snohomish County

Management Actions: Coordination, prevention, monitoring

Summary: A private consultant conducting vegetation surveys detected NZMS August at the Smith Island/Union Slough habitat restoration site on Smith Island in Everett, Washington. The NZMS were confirmed by an independent mollusk expert and WDFW. Visual survey of the general area conducted by WDFW resulted in negative findings of NZMS in the mainstem Snohomish River. WDFW conducted a meeting of local stakeholders to discuss NZMS invasive risks and further response options. Decontamination equipment, protocols, and signage was distributed to stakeholders. Signage preventing the spread of AIS was deployed at boat launches in the general area.

**Thornton Creek/ N. Lake Washington (2011)**

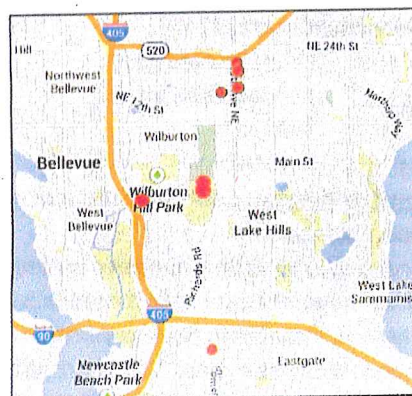
Status: Prevention
Density: Moderate
Lead: King County
Partners: WDFW, University of Washington,
Management Actions: Coordination, prevention, and monitoring

Summary: USGS annually conduct macroinvertebrate surveys in Thornton Creek and confirmed NZMS from a 2009 sample by their Denver science lab. Analysis of the sample was not conducted until 2011. WDFW conducted a brief survey and found NZMS at the mouth of the creek where it enters Lake Washington. Signage preventing the spread of AIS was deployed at boat launches in the general area.

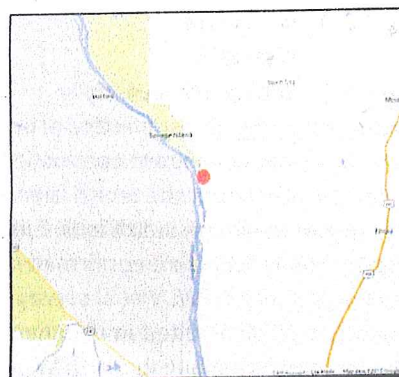


Kelsey Creek/ Bellevue Area (2012)**Status:** Prevention**Density:** Moderate**Lead:** City of Bellevue**Partners:** WDFW,**Management Actions:** Coordination, prevention, and monitoring

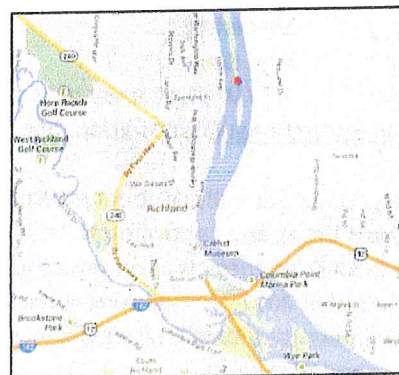
Summary: King County Water and Land Resources Division annually conduct macroinvertebrate surveys in urban streams and detected low numbers of NZMS in Kelsey Creek confirmed by WDFW and an independent mollusk expert. Continual visual surveys of nearby creeks have resulted in new detections (Mercer Creek, Sears Creek, Valley Creek, Maple Leaf Creek, McAleer Creek, and May Creek). WDFW conducted a meeting of local stakeholders to discuss NZMS invasive risks and further response options. Decontamination equipment, protocols, and signage was distributed to stakeholders. Signage preventing the spread of AIS was deployed at boat launches in the general area. King County, City of Bellevue, and City of Seattle implemented decontamination protocols and City of Bellevue implemented surveys for NZMS using visual and "eDNA" inspection methods.

**WDFW Ringold Hatchery Facility (2014)****Status:** Containment**Density:** Moderate/High**Lead:** WDFW**Partners:** N/A**Management Actions:** Coordination, prevention, control planning, and monitoring

Summary: WDFW area fish biologist Paul Hoffarth sent samples of possible NZMS to the AIS Unit August from the main water supply ditch. The samples were confirmed to be NZMS by an independent mollusk expert, AIS Unit, and USFWS. Visual and "eDNA" surveys were conducted of the hatchery and water supply on three different occasions in September and October. The main water and lower diversion water supplies are confirmed to have NZMS. Columbia Basin Hatchery and Columbia Park Pond were also surveyed and no NZMS were found. All out-planting fish are purged of NZMS and fish tanker trucks are decontaminated. Boot wash stations and NZMS signage has been deployed in the general area.

**Lake Wallula/Handford Reach (2014)****Status:** Prevention**Density:** Moderate**Lead:** WDFW**Partners:** N/A**Management Actions:** Prevention and coordination

Summary: A private consultant conducted freeze core samples September 2013 near Richland, WA. The samples were analyzed in February and had low numbers of NZMS confirmed by WDFW and an independent mollusk expert. WDFW conducted a meeting of local stakeholders to discuss NZMS invasive risks and further response options. Decontamination equipment, protocols, and signage was distributed to stakeholders. Signage preventing the spread of AIS was deployed at boat launches in the general area.



Lake Umatilla (2012)

Status: Prevention

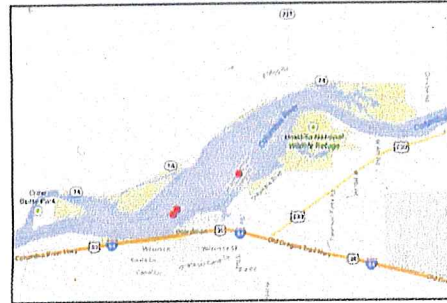
Density: Low

Lead: WDFW

Partners: ODFW, Portland State University

Management Actions: Prevention

Summary: Portland State University (PSU) annually conduct presence/absence aquatic invasive species surveys in the Columbia River system and detected a very low number of NZMS from Crow Butte Park to Paterson, WA. NZMS were detected in very low numbers subsequent sampling years 2013 and 2014 by PSU. WDFW confirmed the detection through personal communications with PSU and has not received other reports of NZMS in Lake Umatilla. Signage preventing the spread of AIS was deployed at boat launches in the general area.

**Snake River/Course Creek (2005)**

Status: Prevention

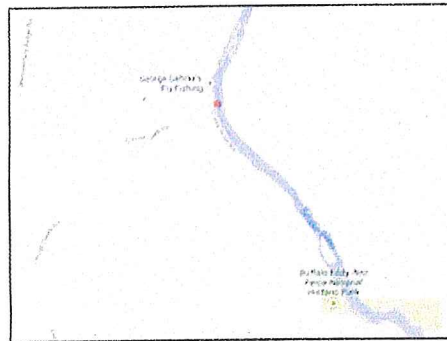
Density: Unknown

Lead: WDFW

Partners: N/A

Management Actions: Prevention

Summary: Montana State University conducted a presence/absence NZMS survey throughout the western United States in 2005. They detected a moderate population of NZMS at the mouth of Course Creek. WDFW has not confirmed the detection or received other reports of NZMS in Course Creek. Signage preventing the spread of AIS was deployed at boat launches in the general area.



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