ON THE **PROWL**

How FWP crews, partner organizations, volunteers, anglers, boaters, and others search for aquatic invasive species to help prevent their spread. BY TOM DICKSON

ROCK HOUND Brian Hagan, AIS monitoring technician, checks a rock in Hauser Reservoir near Helena for invasive snails. Hagan holds a kick net he uses to sample shallow shoreline areas for aquatic beetles, insect larvae, and other small organisms. PHOTO BY THOM BRIDGE

Alicia Stickney stood on the shore of Beaver Lake, a few miles west of Whitefish Lake in northwestern Montana, and noticed something strange.

It was fall of 2011, and Stickney, a Montana Department of Natural Resources & Conservation environmental scientist, was on a work field trip. "I saw these strange plants washing up on shore," she says. "I picked some up and thought, 'Gosh, this has a lot of leaflets. I think it's Eurasian watermilfoil.'"

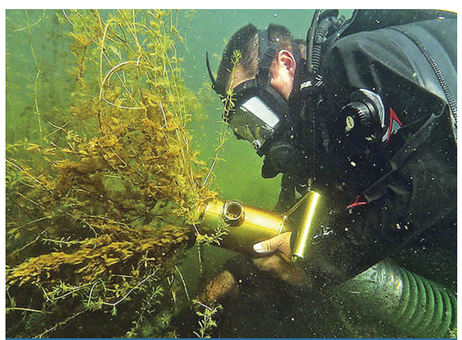
Sure enough, experts with Montana Fish, Wildlife & Parks soon verified that the vegetation was one of the nation's most dreaded non-native plants. Easily confused with the native northern watermilfoil, Eurasian watermilfoil quickly spreads and forms thick mats that carpet lakes and reservoirs. The dense vegetation clogs irrigation pipes and canals, blocks boating lanes, and crowds out swimmers. Infestations can cause lakeside property values to plummet.

The discovery was especially concerning because Beaver Lake is connected by a creek to Whitefish Lake, one of the most popular recreation waters in northwestern Montana.

After Stickney's discovery, the Whitefish Lake Institute, city of Whitefish, and several state agencies quickly deployed crews to kill the largest patches. Afterward, scuba divers used underwater vacuums to suck the plants up by their roots to prevent leaves from fragmenting, spreading, and taking root. Crews also installed a sediment barrier to block milfoil growth and prevent fragments from drifting downstream to Whitefish Lake.

"Our efforts at Beaver Lake have been a success, when few success stories exist with Eurasian watermilfoil invasions," says Mike Koopal, executive director of the Whitefish Lake Institute. Koopal is optimistic that the non-native milfoil can be completely controlled and kept out of Whitefish Lake, "but there's no way that would be possible if we hadn't had a chance to jump on it early, before it was able to spread," he says.

Craig McLane, Aquatic Invasive Species (AIS) Early Detection and Monitoring Program coordinator for FWP, says Beaver Lake exemplifies how early detection can keep invasive species at bay. "Compare that to Noxon Rapids and Cabinet Gorge [reservoirs], where they discovered Eurasian watermilfoil much too late," he says.



VACUUM PICKED A scuba diver uses the DASH method (diver-assisted suction harvest) to remove Eurasian watermilfoil. Vacuuming the invasive species prevents fragments from escaping and reestablishing elsewhere in lakes or reservoirs.

McLane explains that the rapidly spreading plant, first discovered in the two lower Clark Fork River impoundments in 2007, quickly filled bays and surrounded docks. The plant likely arrived on boats from nearby Idaho, where it had been discovered a few years earlier. Noxon homeowner Richard Reich told the *Missoulian* the weeds were so thick they clogged his boat's propeller and made it impossible for his kids to swim off the dock.

"All we can do now is try to keep it under control with herbicides and harvesting, but there's no way we'll ever get rid of it entirely," McLane says.

RESPONDING TO A MAJOR THREAT

Even worse non-indigenous aquatic plants and animals threaten Montana waters. Most dreaded are invasive mussels (zebra and quagga), which spread at astonishing rates, reaching densities of 700,000 per square meter. The thumbnail-size crustaceans quickly blanket marina piers, jam boat engines, clog irrigation pipes, and disrupt hydropower plant equipment. After they overpopulate and die, the bivalves foul beaches with a putrid stench and razor-sharp shells. In other states, invasive mussels have ravaged aquatic ecosystems.

"Ecologically, most invasives are a disaster," says Stacy Schmidt, an FWP environmental scientist. Eurasian watermilfoil muscles out native vegetation, invasive clams and mussels displace native crustaceans and strip water of nutrients needed by fish and aquatic insects, and some invasive species carry parasites deadly to birds. "Then there are impacts we don't even know about," Schmidt says. "These species are scary to anyone who cares about Montana's ecological health."

Scary also to anyone who cares about the state's economic health. In the Great Lakes region, invasive zebra mussels have cost states, cities, and industries tens of billions of dollars to repair damaged power plants, retool municipal water facilities, and unclog irrigation systems.

ON HER RADAR Alicia Stickney, of Helena, holds a clump of Eurasian watermilfoil similar to the specimen she identified at Beaver Lake near Whitefish in 2011. The astute observation allowed crews to jump on the infestation early and prevent it from spreading to nearby Whitefish Lake.

WISCONSIN LAND AND WATER CONSERVATION ASSOCIATION

THOM BRIDGE

Outlays like that caught Montana elected officials' attention. In 2017, after invasive mussel larvae were detected at Tiber Reservoir near Shelby, and another infestation was strongly suspected at Canyon Ferry Reservoir, the Montana Legislature appropriated $6 million per year to aid state AIS efforts, chiefly through FWP programs.

THE AIS OFFENSE

Most aquatic invasive species in North America originated in the ballast water of ocean-going ships entering the Great Lakes from Europe and Asia. From there they spread mainly by clinging to boats, kayaks, canoes, and wading boots. AIS also enter lakes and rivers when people dump aquariums or bait buckets there.

Montana fights this threat on two fronts. One is the widely known FWP boat check station operations on highways and boat ramps, where watercraft are inspected and then decontaminated if found to contain invasive species. Consider this Montana's AIS *defense*.

The other, less-publicized front is the AIS *offense*. This is where early-detection crews look for small invasive populations that may have recently arrived but haven't yet spread. New detections are more likely to be controlled or eradicated, "but once infestations really take hold and spread, it's pretty much game over," McLane says.

AIS specialists search for all sorts of unwanted plants and animals, especially those considered highest risk due to their potential economic and ecological harm. In addition to the mussels and Eurasian watermilfoil, crews look for non-native clams, New Zealand mudsnails, faucet snails, flowering rush, curlyleaf pondweed, fragrant water lily, and more than a dozen other species.

Lacking resources to check every pond, lake, reservoir, stream, and river, AIS crews focus on waters at greatest risk. These include those with extensive boater use, known infestations of other invasive species, high levels of calcium (which fosters invasive mussel growth), and high use by boaters moving to and from other waters—especially those in other states. "By focusing our efforts on those waters, we're making the most effective use of our funding," McLane says.

After AIS officials identify the roughly 350 to 400 waters to be checked each year, early detection and monitoring crews head out in spring. On lakes and reservoirs, specialists drag thin-mesh plankton nets that collect free-floating plankton and any microscopic mussel larvae. To collect larger creatures, like

crayfish and adult snails, mussels, and clams, they use kick nets in shallow water and scrape mud samples from lake bottoms. Crews also rake up aquatic plant samples, scour shorelines, and check under docks and submerged rocks. Snorkelers and scuba divers search for submerged non-natives.

Plankton samples are sent to FWP labs in Helena and Kalispell, where technicians look for mussel larvae through microscopes. In 2020, FWP labs examined 1,852 samples gathered by department crews and another 845 from other partners like the Flathead Lake Biological Station, Clearwater Resource Council, the U.S. Army Corps of Engineers at Fort Peck Reservoir, and Whitefish Lake Institute. Some water samples go to an out-of-state lab that tests for traces of invasive species' DNA.

AIS and diseases also reach new waters when fish are stocked or moved from hatcheries. That's why another component of the AIS offense is annual invasive species and fish health inspections required at federal, state, and commercial hatcheries before fish are transferred within Montana. AIS staff also keep an eye on other states, especially those along the Great Lakes and close to Montana. "We're constantly on the lookout for new species showing up there to know what to look out for here," Schmidt says.

Tom Dickson is the editor of Montana Outdoors.

RAPID RESPONSE

Early detection and monitoring work. Over the past 17 years, FWP and partner groups have verified new AIS infestations in more than 50 waterbodies. After a discovery, monitoring crews keep tabs on the population and measure the effectiveness of control measures. The most intensive monitoring has been on Tiber and Canyon Ferry following the 2016 detection of mussel larvae in plankton samples. After searching for three years and finding no further evidence, FWP stopped inspecting and decontaminating boats leaving Canyon Ferry. Similar restrictions could be lifted on Tiber by 2022 if crews continue to find no adult or additional larval mussels there.

Depending on the invasive species and type of water where it is found, FWP tries to contain or eradicate any newly discovered population. Smaller waterbodies may be drained, as occurred recently on three ponds near Gardiner where curlyleaf pondweed was discovered. Crews will also drain Lake Elmo this fall to rid the popular Billings swimming and fishing water of invasive clams found in 2019. Afterward FWP will refill the lake and stock it with game fish.

SCRAPING SLED AIS crew members use a benthic sled at Lake Elmo to collect invasive clams (below) discovered in 2019. Dragged behind a boat, the sled scrapes a layer off the lake bottom into a net that collects material as small as ¼ inch long.

CLOCKWISE FROM TOP LEFT: JOHN WARNER; THOM BRIDGE; JOHN WARNER

> "This is a classic example of how people who are out recreating are often the first to notice something weird and then report it to FWP."

Smaller vegetation infestations are pulled by hand or covered with fabric mats that block sunlight, killing the plants. At Noxon Rapids and Cabinet Gorge reservoirs, FWP and the Sanders County Aquatic Invasive Plants Task Force use herbicides, cutting, pulling, and raking to open areas around ramps and docks clogged with Eurasian watermilfoil. After New Zealand mudsnails were discovered in FWP's Bluewater Fish Hatchery near Bridger, all the fish were destroyed and the facility was completely drained, decontaminated, and dried.

McLane says the hatchery discovery and response is another example of how early detection helps. "People sometimes say, 'Why bother? These species will just get here anyway.' My answer is that if we can respond fast enough, like we did at Bluewater, we can keep a bad situation from getting worse."

McLane admits that not every infestation, even if detected early, has a solution. "In cases like the Madison and Missouri rivers, where New Zealand mudsnails are widely established, there's no feasible control program," he says.

FWP recommends boaters and anglers using those and other waters always clean, drain, and dry their watercraft, fishing gear, and waders to prevent spreading the tiny mudsnails, which can cling to vegetation or hide in mud left on gear. "New Zealand mudsnail females can reproduce by cloning themselves, so it only takes one snail to start a new infestation," McLane says.

DRAGGING THE LAKE AIS monitoring technician Paul Bramblett tosses a plant rake into Spring Meadow Lake to gather vegetation for analysis. "People have a lot of questions," Bramblett says. "Sometimes they come up and ask, 'Are you guys looking for a body?'"

PEOPLE AND OTHER PARTNERS

FWP can't execute its AIS offense alone. Due to Montana's vast size and many waters, the agency partners with dozens of associations, groups, communities, tribes, and state and federal agencies to prevent new infestations. "A major challenge with early detection is there aren't yet many organisms to detect, so they can be super difficult to locate. That's why we need as many eyes out there as possible," Thomas Woolf, FWP's AIS Bureau chief, says.

Many organizations recruit "citizen scientists" to help. For instance, volunteers

NEVER-ENDING SEARCH Top left: Brian Hagan lifts a hunk of vegetation collected with a plant rake at Hauser Reservoir. FWP's AIS crews check 350 to 400 waters each year, and over the past 17 years have verified new infestations in more than 50 waters. Top right: Hagan loads a boat onto a trailer at Hauser. AIS crews motor to the middle of reservoirs and large lakes, where they use plankton nets to search for microscopic larvae of invasive mussels. Before moving to another water, they soak the nets in vinegar to kill any lingering organisms. "We don't want our nets to be a vector that spreads invasive species," says Hagan. Bottom right: Vegetation, plankton samples, and suspect snails and other organisms are sent to the AIS lab in Helena, where Keegan Effertz and another lab technician examine and identify specimens. In 2020, the Helena lab and another in Kalispell examined 1,852 samples gathered by FWP crews and another 845 from partner organizations and agencies. Bottom left: Looking for organisms at Spring Meadow Lake to send to the lab for analysis.

with Swan Valley Connections, the Blackfoot Challenge, the Clearwater Resource Council, and the Missoula County Weed District sample Holland, Van, Lindbergh, and Swan lakes three times each year to look for invasive mussel infestations.

JUST OUT FISHING

Then there's the regular people out fishing, boating, and walking lakeshores who spot something weird and report it. That was the case in 2018 when Tom Jacobson and a friend were walleye fishing on Lake Frances, northwest of Great Falls, and noticed tiny clams and snails clinging to their line and lures. Jacobson, a state senator, put the gastropods in a lure box and delivered them to FWP staff for identification. Though the clams turned out to be native, the snails were invasive faucet snails, which carry parasites deadly to waterfowl and were blamed for the deaths of hundreds of coots on Georgetown Lake in 2006. "That was a great example of how people out recreating are often the first to notice something weird and then report it to FWP," says McLane.

This past December, an angler sent the department photos of invasive red-rimmed melania snails spotted in the Missouri River near Great Falls. An FWP crew quickly investigated the site and found no additional specimens, but will continue to monitor the water in 2021. "We figure the snails got there when someone dumped out their aquarium, which is illegal but unfortunately common," McLane says.

As for Alicia Stickney, the woman who may have saved Whitefish Lake by spotting Eurasian watermilfoil in Beaver Lake, the most important lesson she learned is to always be on the lookout for anything unusual in or along a lake or river. "It's important for people to recognize that Montana has all these pristine waters and then be curious whenever they see something odd that could pose a threat," she says.

The plant or animal might turn out to be harmless. Or it could be a destructive species that, if caught in time, won't have the opportunity to ruin a part of Montana's great outdoors.

CLOCKWISE FROM TOP LEFT: THOM BRIDGE; THOM BRIDGE; MONTANA FWP; THOM BRIDGE