


KEEPING THE INVADERS AT BAY



Aquatic invasive species degrade ecosystems, hamper recreation, and cost businesses a bundle. Can they be contained?

BY TOM DICKSON

IT DIDN'T TAKE LONG. Kansas scientists first detected zebra mussels in the state's 8,000-acre El Dorado Reservoir in 2003. Within just three years, numbers of the fingernail-sized mollusks had mushroomed to 25,000 per square meter, putting the lake's population in the billions. In addition to covering every rock, log, and fishing pier in the reservoir, the foreign mussels filtered zooplankton from lake water, robbing food essential for native fish. "We saw a sharp decline in gizzard shad—the main forage fish here—and the condition of white bass and walleye really declined, with a lot of skinny fish," says Jason Goeckler, aquatic nuisance species coordinator for the Kansas Department of Wildlife and Parks. The pest species has since spread in Kansas to eight other reservoirs. "I've told other states, 'You do not want these things in your waters,'" Goeckler says.

Montana is listening—and also to warnings about Asian carp, VHS virus, Eurasian watermilfoil, and other aquatic invasive species (AIS). The water-borne invaders take over lake and river ecosystems,

kill native fish, and ruin recreational and industrial equipment. "There are so many reasons for Montana to be very concerned about these species," says Hal Harper, a lifelong angler and chief policy advisor for Governor Brian Schweitzer. "This is an urgent matter for everyone in the state."

Adding to the urgency is the ease and speed by which invasive species are spread by boats, engines, wading boots, and other gear of mobile anglers, boaters, fisheries workers, bridge and dam contractors, and irrigators. "You've got anglers fishing the Yellowstone or Fort Peck one day, and then the next day they're at the Bighole or Canyon Ferry," says Eileen Ryce, aquatic nuisance species coordinator for Montana Fish, Wildlife & Parks. "People move around, and they unknowingly carry AIS with them."

STAY OUT

According to Ryce, most aquatic pests reach North America when oceangoing ships release ballast water from their hulls upon arrival in the Great Lakes or coastal ports. The foreign organisms then move from state to state, clinging to boats and wading boots, traveling in bait bucket water, and spreading via the aquarium and gardening trades.

Ryce says that of the several dozen aquatic invasives lurking outside Montana borders, she and other watchdogs are most concerned about zebra mussels (and the closely related quagga mussels), VHS virus, and Asian carp. First discovered in the Great Lakes in the 1980s, zebra mussels have since spread throughout nearly every major river in the midwestern and mid-Atlantic states. They were likely transported in boat livewells, where the microscopic larvae can survive for weeks. Western states sounded the alarm in 2007 when quagga mussels appeared in Nevada's Lake Mead—the first infestation west of the Rockies. "That was a huge wake-up call for everyone out here," says Ryce.

Lacking natural predators to keep numbers in check, the mussels reproduce and spread at astonishing rates across hard surfaces, blanketing marina piers and boat hulls. They jam boat engines and consume food and oxygen needed by native organisms. Water-using industries are especially vulnerable: Mussels block water-intake pipes, clog irrigation systems, and disrupt water purification and hydropower plants. When the mussels overpopulate and die, they foul beaches with a putrid stench and razor sharp shells.



A SORRY STATE Kansas officials say that within three years, zebra mussels in 8,000-acre El Dorado Reservoir mushroomed to 25,000 per square meter, covering every hard surface in the lake.

JASON GOECKLER/KANSAS DWF

Another AIS threat is silver and bighead carp. Originally from Asia, the species have moved upstream along the Mississippi and Missouri rivers after escaping from commercial fish ponds in southern states. (The species are related to the common carp, a fish found throughout eastern and central Montana that was first imported into the United States from Europe in the late 1800s.) “When I was touring the Illinois River last year, I saw stretches where silver carp were so thick it looked like you could have walked across the river on their backs,” says Ryce. The plankton-feeding carp have displaced entire fish populations in the lower Mississippi River. “Our biggest concern is these species getting into the Yellowstone and lower Missouri rivers,” Ryce says. “They could outcompete paddlefish, sauger, and sturgeon by taking out all the primary production in the food chain.” Asian carp now swim in South Dakota waters; at FWP check stations, anglers from that state have been caught bringing live bait illegally into

Montana. “If Asian carp get here, they will likely be mixed in with other minnows in someone’s bait bucket,” Ryce says. The newest blip on Montana’s aquatic invasives radar is VHS (viral hemorrhagic septicemia), a virus linked to large fish kills in the eastern United States. A new and unique strain of the disease first appeared in the eastern Great Lakes in 2005. Scientists have since verified VHS in several midwestern inland lakes, and in January 2010 they detected it in Lake Superior for the first

time. The viral disease causes fish to bleed through the skin surface and internally before dying. “One of the most troubling things about VHS is that it can be passed directly from fish to fish. If one gets sick, they all can,” says Andy Noyes, fish pathologist with the New York Department of Environmental Conservation. According to Noyes, the virus is likely responsible for killing 90 percent of the St. Lawrence River’s world-renowned muskie population in recent years and causing large die-offs of

freshwater drum and perch in other waters. **STAY PUT** Just as troubling as the aquatic invasives outside Montana borders are the ones already here. The most worrisome is Eurasian watermilfoil, which first appeared in Noxon Rapids and Cabinet Gorge reservoirs near the Idaho border in 2007. The plant likely was carried there on boats trailered from the neighboring state, where the species was first discovered a few years earlier. Or it could have been dumped from a store-bought aquarium, in which the plant is sometimes unlawfully stocked. (Eurasian watermilfoil is listed as a prohibited noxious weed, making it illegal to propagate the plant.) Eurasian watermilfoil forms thick underwater strands of tangled stems and, on the water surface, creates vast mats of vegetation. It clogs irrigation pipes and canals, blocks boating lanes, makes swimming areas unusable, and displaces native lake vegetation. In the Midwest, anglers curse Eurasian watermilfoil for rendering many lakes unfishable. Beaches have been closed to public use after swimmers became entangled in thick milfoil mats. The plant now occupies nearly 400 acres of Noxon and Cabinet Gorge reservoirs.

MONTANA RESPONDS Montana took a major step in containing the AIS threat in 2004 when it created the position of a statewide aquatic nuisance species coordinator to manage the prevention and control of water-borne invaders. Ryce says part of her job is to work with counterparts in nearby states and provinces to monitor new infestations, share research, and coordinate control work. “We’re only as safe as the states around us,” she says. Another important measure came in 2009, when the Montana legislature passed the Aquatic Invasive Species Act. The legislation authorizes MDA and FWP to designate infested waters as Invasive Species Management Areas, where they can restrict boat movement, require anglers to inspect and clean boat exteriors, and levy fines for non-compliance. The legislation establishes a state fund to increase control and prevention measures and boost public education; it also authorizes the two agencies to work cooper-

agency is working with a local task force to contain the plant. Check stations will be set up this summer to make sure boats leaving the two reservoirs are weed-free. MDA is also working with scientists from Mississippi State University and the U.S. Army Corps of Engineers to test methods of controlling the invasive plant.

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3 EASY STEPS

Anglers, boaters, and other water recreationists should follow these simple steps to reduce the spread of aquatic invasive species:

1. INSPECT

After leaving a lake or stream, inspect your boat, engine, trailer, anchor, waders, wading boots, and other fishing and boating gear for mud, water, and vegetation that could carry aquatic invasive species.

2. CLEAN

Completely remove all mud, water, and vegetation you find. Boaters should use a pressurized power sprayer, found at most car washes. Hot water helps kill organisms, and the pressure removes mud and vegetation from small nooks and crannies in the trailer, boat exterior, motor, and other equipment. There is no need to use soap or chemicals.

3. DRY

Aquatic invaders can survive only in water and wet areas. Drying all boating and fishing equipment thoroughly will kill most alien organisms. The longer you can keep your boat, trailer, waders, wading boots, and other equipment outside in the hot sun between fishing trips, the better.

Groups urge anglers to take the pledge

Many Montana and national angling groups and conservation agencies are urging anglers and boaters to pledge to “inspect, clean, and dry” their boats, boots, and other gear between trips. Sponsors include the U.S. Fish & Wildlife Service, Montana FWP, Recreational Boating & Fishing Foundation, Federation of Fly Fishers, National Wildlife Federation, Montana Trout Unlimited, Montana Trout, Walleyes Unlimited of Montana, Walleyes Forever, Greater Yellowstone Coalition, Fishing Outfitters Association of Montana, and Whirling Disease Foundation. To take the pledge, visit cleanangling.org.



LEFT TO RIGHT: MATT LONG; MONTANA OUTDOORS; MONTANA OUTDOORS; ISTOCKPHOTO.COM

AIS DELIVERY SYSTEMS People inadvertently spread aquatic invasive species into and throughout Montana by moving heavy equipment from one lake or river to another; in bait bucket water; in mud, vegetation, and moisture on wading boots and waders; and on propellers, engines, trailers, and other boating equipment. Conservation groups say keeping gear clean is essential to stopping the spread of aquatic invasives.

actively on aggressive public outreach. Agency officials say bumper stickers, radio and TV ads, and other formats containing invasive species information will begin appearing this summer.

Montana is fighting Eurasian watermilfoil and other AIS on several fronts. FWP crews inspect watercraft at boat ramps, fishing tournament sites, and other high-use areas. Last year seasonal technicians examined nearly 1,000 boats and other watercraft at 82 events on 18 different lakes, reservoirs, and rivers. “One thing we’re finding is that tournament walleye anglers are showing up with some of the cleanest boats,” says Ryce. “They are very well educated about aquatic invasive species because it’s such a big deal in the states many of them are from.” FWP crews also looked for AIS at 252 sites on Flathead Lake, Canyon Ferry Reservoir, Fort Peck Lake, and other high-use waters last year. “Early detection is critical,” says Ryce. “If we find a new species soon enough, the odds are much better that we can take steps to contain it.”

Among the MDA outreach efforts begun last year are roving border check stations and increased surveillance for new aquatic weeds,



NOT A KEEPER A New York walleye ravaged by viral hemorrhagic septicemia (VHS). The fatal fish virus, first detected in the Great Lakes region, is now moving west.

says Erik Hanson, hired as the agriculture agency’s invasive species coordinator in 2009. He says MDA staff will soon begin visiting pet stores and plant nurseries to educate owners about the importance of not stocking potential invaders in their inventories.

CYNICISM A CHALLENGE

Despite Montana’s proactive response to aquatic invasives, the state faces several major challenges. “It’s hard to get the public’s attention, because they don’t see aquatic species,” says Bob Gilbert, president of Montana

Walleyes Unlimited and a previous president of the Montana Weed Control Association. “With spotted knapweed, you can point to the purple hills outside Missoula. But with things like zebra mussels, the problem is largely hidden.”

Another obstacle is public cynicism. Many anglers believe FWP and conservation groups in the past overstated the potential threats of aquatic invaders. Despite a decade’s presence in Montana, New Zealand mudsnails have not been proved to harm fish populations, despite evidence the mollusks are crowding out native mayfly and caddis fly populations in some river stretches. And whirling disease, once hyped by East Coast media as the possible death knell of western fly-fishing, may be less harmful than early reports predicted. The disease nearly wiped out wild trout in many Colorado streams and caused Montana’s Madison River rainbow population to decline by 80 percent in the late 1990s. But it has not—so far—created the devastation agencies and environmental groups warned of. The Madison’s surviving rainbows appear to have become genetically resistant to the parasite, which still infects the river. Trout numbers

Traditional wading boots felt to be a problem

One of the major paths, or “vectors,” by which aquatic invasive species spread is on the felt soles of wading boots worn by trout anglers, fisheries workers, and others who spend time in streams and rivers. A 2007 study conducted at Montana State University on angler movement found that the average pair of wading boots sampled carried more than 16 grams of sediment. The study estimated that in one year, angler boots moved more than 6,300 pounds of sediment between access sites in southwestern Montana and that nonresident anglers carried more than 1,600 pounds into Montana.

Responding to growing evidence that aquatic invasives can survive in the sediment and moisture retained in felt’s dense mat of woven fibers, Trout Unlimited in 2008 called for eliminating the material on fishing boots by 2011. Felt-soled boots are now banned in New Zealand and will not be allowed anywhere in Alaska beginning in 2012. The Utah Division of Wildlife Resources has eliminated use of felt soles by its professional staff.

This year Bozeman-based Simms Fishing Products discontinued its felt-soled boot line and began selling Vibram-soled boots only. “We know felt is not the only material that has spread invasive species and disease, but it is surely part of the problem” says Simms president K. C. Walsh. Patagonia, Korkers, Chota, Orvis, Dan Bailey’s, and others have also introduced boots with rubber soles.

Previous models of rubber-soled wading boots were notoriously slippery on algae-covered rocks. Dave Kumlien, executive director of Trout Unlimited’s Whirling Disease Foundation and a longtime Montana fly-fishing outfitter, has tried several new versions and says they are superior to earlier rubber soles. “The rubber is grippier and stickier. In my experience the new boots, when used with metal studs, are actually better than felt,” he says. “On grass, felt is really slippery, and in snow it’s a disaster.” The lugged rubber soles also improve traction for climbing muddy riverbanks, he adds. Kumlien acknowledges that studded soles can tear up boat bottoms, “but we put rubber mats or carpet down, and that works real well for protection.” ■



The new generation of sticky, stay-clean rubber-soled boots.

PHOTO COURTESY SIMMS FISHING PRODUCTS

have rebounded, attracting anglers and making the Madison the state’s most heavily fished river. “I definitely think anglers have become jaded because of some aspects of how the whirling disease issue was handled,” says Bob Wiltshire, executive director of the Livingston-based Center for Aquatic Nuisance Species and previously chief operating officer for the Federation of Fly Fishers.

As these examples illustrate, no one can definitely predict what AIS will do to aquatic ecosystems. That’s why experts now believe the best response is for anglers, boaters, and others to take three easy steps to reduce the spread of all water, mud, and vegetation (see sidebar on page 17). “People don’t need to understand complicated biological life cycles or even what the different species look like,” says Wiltshire. “All they need to remember is that mud, water, or vegetation on your boat, boots, and other gear could be carrying aquatic nuisance species of some sort. And that they need to inspect their gear, clean it thoroughly, and make sure it dries completely before going out again.

“We want people to make these precautions part of their regular routine,” he adds.

Other experts concur. “If people follow the ‘inspect, clean, and dry’ guidelines, they’ll be doing their part to reduce the risk of spreading aquatic invasive species,” says Dave Kumlien, executive director of Trout Unlimited’s Whirling Disease Foundation and a 30-year Montana fly-fishing outfitter.

That’s advice Goeckler, the Kansas AIS coordinator, wishes his state had taken to heart several years ago. “People tend to not be concerned about these species until they show up in their own backyard,” he says. “They need to take this issue seriously today. Prevention is a lot easier and cheaper than any attempts at control.” 🐾

Learn more about the threat of AIS and what you can do at:

- Center for Aquatic Nuisance Species: stopans.org
- Montana Department of Agriculture: agr.mt.gov (look for “Aquatic Weeds”)
- FWP Aquatic Nuisance Species Program: fwp.mt.gov/fishing/guide (look for “Aquatic Nuisance Species” under “Quick Access” on the left panel)
- Aquatic Nuisance Species Task Force: anstaskforce.gov



PROLIFIC PIECES Eurasian watermilfoil reproduces by fragmentation. When disrupted by waves or boat motors, the plant breaks into small pieces, each of which can form roots to create an entirely new plant. In one year, a single stem fragment can multiply into 250 million new plants. “The thought of that kind of spread happening in Flathead Lake, the Thompson Chain of Lakes, or Canyon Ferry Reservoir is a nightmare,” says Eileen Ryce, FWP’s aquatic nuisance species coordinator.

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