

SPOTLIGHT — INVASIVES

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Land managers and scientists discuss management options near the Dolores River at a TC organized Grazing Training this spring. Photo: Daniel Oppenheimer, Tamarisk Coalition

Nonprofit Provides Habitat Restoration Resources for Western River Managers

by Stacy Beagh, Shannon Hatch and Audrey Butler

Tamarisk, a woody shrub introduced from Eurasia in the 1850s, has long been negatively affecting riparian systems in the western US (Allred and Schmidt 1999, Busch and Smith 1993, DiTomaso 1998, among others). Over the past several decades, many scientists, private landowners, government agencies, industries, and nonprofit organizations have undertaken the task of trying to manage tamarisk in a way that will enhance wildlife habitat, improve access for recreation, reduce wildfire risk, and enhance channel morphology (Shafroth et al. 2008, Shafroth et al. 2005).

In 2002, the Tamarisk Coalition (TC), a nonprofit organization based in Grand Junction, Colorado, was founded to assist

localized efforts and provide coordination of resources to help address riparian habitat restoration on a regional scale. TC supports riparian habitat restoration activities by providing education and technical assistance to anyone interested in restoring riparian lands in the West. There are many components of riparian habitat restoration; TC specializes in helping land managers tackle the issues associated with control and management of tamarisk and other woody invasive plants, including native plant revegetation techniques, identification of monitoring approaches and maintenance plans, and assistance in finding sustainable funding sources, which are all important components of riparian habitat restoration.

TC has extensive experience coordinating large-scale, multi-

jurisdictional watershed efforts and has been involved with many different partnerships, government agencies, organizations, and industries throughout our 10-year existence. We use information gathered in these partnerships to convey current practices and lessons learned to others undertaking similar endeavors. TC prides itself on helping to bring the right people to the table at the right time to effectively navigate processes integral to cohesive restoration efforts. In other words, we strive to connect partnerships and individuals with the best available resources and information to help them succeed.

Examples of this assistance include coordination of annual conferences, development of resources such as a

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professionals who study, protect, and
manage North America's rivers.*

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endorsement, or mission of RMS. The
purpose of this policy is to encourage the
free exchange of ideas concerning river
management issues in an open forum of
communication and networking among the
RMS membership. Unless indicated, points of
view are those of the author and not RMS.

Executive Director's Eddy



Welcome to the Summer 2012 *RMS Journal*, ably produced by former Program Director Caroline Kurz who we thank for its continued excellence.

This issue represents a programmatic departure from the past, for its focus is not on work that is going on in a specific chapter or region, but on a river management topic of national interest and importance. We've been lucky enough to be able to tap the expertise and experience of our members and others, receiving articles on aquatic nuisance species and invasive plant management, now very familiar to those who work in your office...and maybe he/she who works at your desk!

Dealing with nonindigenous species of plants and animals is not new, and most provide great benefit. However, a small percentage of the organisms which are introduced to new homes that cause serious problems, collectively known as invasive species, can harm the environment, the economy, and sometimes human health. The cost of invasive species (terrestrial and aquatic) in the United States amounts to more than \$100 billion each year.¹

National policy and interagency plans have been put forth by the National Invasive Species Council (NISC), which provides leadership and coordinates federal efforts to curb invasive species, and the Invasive Species Advisory Committee (ISAC), established to advise

the federal government on behalf of many interested parties and stakeholders to:

- **Prepare** via leadership and coordination, research, information management;
- **Prevent** through early detection and rapid response; and
- **Protect** by means of control and management, restoration, education and public awareness.

Additional information on NISC, ISAC, and links to member agencies as well as a national invasive species management plan, is available at the NISC web site: www.invasivespecies.gov.

RMS recognizes the important role of invasive species management in the responsibility of river managers and hopes this issue provides a glimpse into a few initiatives designed to educate and engage the public about invasive species challenges. The Northeast Aquatic Nuisance Species Panel and innovators among Bureau of Land Management and National Park Service staffs are performing monumental removal and replacement efforts, utilizing innovative education initiatives and/or super charging their efforts with skilled river workers from the awesome Youth Conservation Corps. Not only are we creating success in the battle against invasive species, we are growing a new legion of river stewards who may stand in line for our positions... music to our eyes and ears!

We'll return to a chapter focus for the 2012 Fall issue of the *RMS Journal*, and would like to take a shot at another area of river management interest next year. Let us know what you think of this 'topic-focused' issue. Enjoy. ♦

Risa Shimoda
RMS Executive Director

¹ <http://www.habitattitude.net/impacts/index.php>

Source: Invasive Species Definition Clarification and Guidance White Paper Submitted by the Definitions Subcommittee of the Invasive Species Advisory Committee (ISAC), April 27, 2006.

From the President

I am just fresh back from a week in Asheville, NC. An enchanting place on the western slope of the Appalachian Mountains, where one can find a great selection of craft beer, sweet Carolina BBQ and Blue Grass Music at its source. From April 23 through 26 it was home to the RMS Symposium. It was of course the great event to which we have become accustomed. The quality and variety of presentations was excellent, fun field trips and a great place to visit friends and discuss all things river. Our numbers were down a little over past events, likely due to location and agencies with tightened travel ceilings. It was good to serve the eastern side of our territory. It was unique to see the SE Chapter meeting had a larger attendance than the SW. A big tip of the hat to our organizing committee led by Mary Crockett and Gary Marsh. Thanks also to our local partner, River Link. They did a fine job of providing the entertainment and coordinating the hospitality and entertainment.

A trip to Appalachia was somewhat of a pilgrimage for a dweller in Utah's canyon country. One of the mysteries of geology in these parts is where did all that sand come from that created our massive Navajo and Wingate sandstones. Geologists recently figured it out with the help of very small zircon crystals. They eroded off the Appalachians back in the day when these rolling green hills were larger than the present day Rocky Mountains. Just more proof we are all connected and interlinked in more ways than we would imagine.

Elsewhere in this *Journal*, you will read about our RMS awards recipients. Congratulations to them all. One of the great pleasures of this position is being able to present these awards. This year I had a co-presenter, Rebecca Wodder, Special Advisor to Secretary of the Interior, Ken Salazar. These awards are the highest form of recognition granted by RMS. They are special because the nomination and selections are made by a committee of peers. Even I did not know who the nominees were until after the selections were made. They are also the ultimate in peer appreciation.

I want to tell you about the actual



River Manager of the Year, Jennifer Jones, receives her award from RMS President, Dennis Willis, at the recent RMS Symposium in Asheville, NC. Photo: Bunny Sterin

plaque that is presented to those who earn them. RMS awards are prized for what they represent. They are also beautiful objects, works of original art and you will never see them anyplace else. They are handmade, hardwood inlay. Mike Kurz created a flowing river design and for many years crafted the awards for RMS. Mike recently changed some of his career commitments and was no longer able to invest the hours it takes to build just one, much less four. I took Mike's design and templates to the Castle Valley Workshop, a sheltered work environment for people with disabilities. They make many trophies and plaques, but they had never done inlay work. They accepted the challenge and an opportunity to expand their skill set and the results are beautiful. So, not only do our awards honor our members, they create jobs and skills enhancement for people that really need them. If you are lucky enough to possess one of these works of art, display it with pride. If you have not earned yours yet, take a good look at one just to admire fine craftsmanship and an object of beauty.

Most all of the above is history, some

of it millions of years old. The future is coming upon us now. There is much we can be doing to make the future into wonderful history. Start thinking about who you will nominate for awards next year. Look in the mirror and see if you don't see leadership in RMS looking back. If you don't, look to find some among your many friends. If you have friends that are not in RMS but should be, recruit them. Workshop is coming up in spring 2013 and Symposium in 2014. How are you going to get there? Present a paper? Be an officer or committee person? All these opportunities are coming, don't wait until they pass with your regrets instead of celebrations.

Also at the Symposium, the board hosted a free "pizza and beer for your thoughts" session. We had a good turnout despite some of the attendees literally coming in bedraggled having just come off a Chattooga float field trip. We heard a number of worthwhile suggestions and much good discussion. Of particular interest was the subject of membership and recruiting new and

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Controlling *Invasive Species*

along the Colorado River in Grand Canyon National Park

by Allyson Mathis, Lori Makarick, and Brian Healy

Grand Canyon National Park uses a landscape approach towards protecting riparian and aquatic ecosystems along the Colorado River and its tributaries. The park's Division of Science and Resource Management aims to protect and restore functioning native plant and native fish communities in the canyon. Control of invasive species is an integral part of restoring native communities.

Invasive, or exotic, species can degrade the environment, impact native plant and animal communities, cause economic impacts, and threaten human health and well-being. Specifically, invasive (or non-native) species impair park resources by disrupting the canyon's complex ecosystems, frequently reducing biodiversity, modifying or degrading wildlife habitat, and jeopardizing endangered species, such as humpback chub, one of the four remaining species of native fish in the Colorado River in Grand Canyon.

Aquatic and riparian ecosystems in Grand Canyon National Park face serious threats from invasive plants, non-native fish species, and aquatic nuisance species such as the New Zealand mudsnail. Invasive plants that threaten riparian ecosystems in Grand Canyon include tamarisk, camelthorn, Russian olive, Ravenna grass, pampas grass, Sahara mustard, and other species. Chief of Science and Resource Management Martha Hahn said, "Invasive and exotic plants, animals and invertebrate species present a myriad of threats to Grand Canyon's native and endemic species. Hence, controlling invasive species is one of the emphasis areas for Science and Resource Management. We focus on controlling species that have the most adverse impacts and where our efforts can have the most positive outcomes for native species. Our goal is to ultimately restore ecological balance throughout Grand Canyon."

To date, 115 exotic plant species have been documented in the park's inner canyon and along the Colorado River corridor. Only a handful of these species, including tamarisk and brome grasses, dominate vast acreages, causing landscape level change along the river. Although the challenge of preserving park ecosystems from invasive plants is great, the park has made important advances towards reducing the impacts of exotic plants. Park staff also work alongside hundreds of volunteer stewards who assist with intensive invasive plant control efforts each year.

The park's invasive plant management program has two main emphasis areas: surveying for new occurrences of invasive plants and controlling non-native plants that are already established in the park.

During control projects in 2011, crews removed 74,453 individual non-native plants from nearly 182 infested acres in the park's backcountry. This accomplishment was made possible because of the large number of volunteers who contributed more hours to the Vegetation Program than ever before. Last year, the park began a new program to help control invasive plants in established campsites along the Colorado River. In the Adopt-a-Camp program, professional river guides, park staff,

volunteers, and Grand Canyon Youth participants remove high priority invasive plants from selected river campsites following protocols provided by park. The program currently focuses on the removal of two species, camelthorn and Russian thistle. These two species were chosen because of their ability to rapidly spread and dominate pristine, sandy, campsites available along the river corridor.

Control of invasive tamarisk in tributaries is a major component of the park's invasive plants program and has been ongoing since 2002. The project has focused on tributaries and side canyons, which contain high quality desert riparian habitat and retain their natural hydrology. To date, more than 290,000 tamarisk trees have been removed from at least 130 tributaries. Chief of Science and Resource Management Martha Hahn said, "The tamarisk removal program has been really successful, but the return of native diversity in the side canyons after the tamarisk trees are removed is a slow process. It is difficult, expensive, and sometimes not feasible to try to re-create a native habitat, community or ecosystem once it has been lost, so the project has reinforced how important it is to control invasive species, or prevent their establishment before they take over and dominate."

Until recently, tamarisk control in the river corridor only occurred at a limited number of seeps and springs. The management of over 900 acres of tamarisk along the Colorado River did not seem feasible, but that may change over the next few decades. The northern tamarisk beetle (*Diorhabda carinulata*), a biological control agent purposely imported into the United States to manage tamarisk has made its way to Grand Canyon and is expanding its distribution each year. Adults and larvae feed on tamarisk, which stresses the trees, and after several years of repeated defoliation, ultimately leads to death. Park managers are working with multiple stakeholders to proactively respond to this change.

One of the park's other successes in controlling invasive plant species is the removal of Himalaya blackberry plants from the Indian Garden area. By 1999, this plant dominated the stream-side habitat along Garden and Pipe Creek and was threatening to reach the Colorado River and spread throughout the river corridor. The next year, the park began an aggressive project to eradicate Himalaya blackberry at Indian Garden that was complemented by planting native vegetation to replace the exotic plants, eliminating this threat to the park's riparian ecosystems. Arizona grape, cattail, red bud, coyote willow, and other native species now thrive along Garden Creek, providing food and shelter to a myriad of wildlife species.

Non-native fish, especially rainbow and brown trout, have become abundant in the altered aquatic ecosystem of the Colorado River, and in many tributaries. Warm-water species such as common carp and channel catfish, although still present, were likely more abundant in Grand Canyon prior to the construction of Glen Canyon Dam and subsequent cooling of the river. Today, at least 13 species of non-native fish are found in the

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Volunteers spent many hours manually removing thousands of Sahara mustard from Lees Ferry.



Lake Mead Exotic Plant Management Team members partnered with Grand Canyon to remove exotics, like pampas grass, from side canyons.



NPS Biologists and Volunteers electroshocking in Bright Angel Creek.



Removing cut tamarisk from the drainages is necessary to prevent resprouting and for aesthetic reasons.



Brian Healy, Fisheries Biologist, holds non-native Brown Trout from Bright Angel Creek.



Crew members and volunteers clip seedheads of Ravenna grass before digging the plants out of the ground. Credits: National Park Service

Keeping Asian Carp Out of the Great Lakes

by Sam Finney

Asian carp, accidentally released into the Mississippi River basin, have steadily spread north and could invade the Great Lakes. And the consequences could be quite bad. But the U.S. Fish and Wildlife Service (Service) and its partners are trying to staunch the flow of fish northward, to protect the Great Lakes.

Toward that end, the Service led the creation of, and is implementing, a national management and control plan that will restrain Asian carp. The plan prescribes well over 100 management actions ranging from public outreach, policy changes, and commercial fishing harvest increases, to Asian carp impact mitigation via fish stocking, finding Asian carp-specific poisons, and designing effective fish barriers.

Collectively, four species of fish— black carp, grass carp, silver carp and bighead carp—are known as Asian carp. They were brought into the U.S. from the 1960s through the 1980s as a tool for clearing algae-laden ponds, eating unwanted aquatic plants, and ridding aquaculture catfish ponds of snails and their associated parasites. Responsibly used, black carp and grass carp both have utility in aquaculture and aquatic plant management, but the risk of their escape into the wild is high. Both could gorge

Colby Wrasse, U.S. Fish and Wildlife Service biologist, holds a large bighead carp captured on the Mississippi River. Photo: USFWS



The Perfect Vector

by Steve Johnson

The Mississippi River is often called America's River and it is clearly the largest river system in North America. But that also makes it the continent's largest vector for aquatic invasive species.

Spanning all or parts of 31 states and two provinces, the Mississippi River basin provides a perfect aquatic pathway for invasive species.

Consider the zebra mussel, *Dreissena polymorpha*. A native of southern Russia, it arrived in the Great Lakes via the ballast water of ocean-going ships. It didn't spread much beyond the Great Lakes until it found its way down the Illinois Waterway, which includes a system of canals connecting Lake Michigan with the Illinois River, a major tributary of the Mississippi. Once in the Mississippi, zebra mussels spread quickly throughout much of the United States.

If you swim and get into the Mississippi River, you can travel from New York and Virginia to Montana and New Mexico without having to come up for air. The Great River is the perfect vector for aquatic invasives.

Unless you build a dam. I've spent most of my career disliking dams and have cheered at the removal of a few and campaigned for fish passage around others. But if you build a big enough dam, most aquatic invasive species can't get around. At least not without help.

The Upper Mississippi River has 29 locks and dams between St. Louis and Minneapolis, but most of them aren't designed to slow down invasive species and even the few that are big enough to be barriers have locks through them that allow boats—and anything that can hang onto a boat or swim with it—to get through. Above Minneapolis and on many tributaries there are high dams that should be effective barriers if we didn't encounter all those human helpers who unwittingly carry invasives in their bait bucket, in their boat's live well, stuck onto their boat trailer, etc.

Zebra mussels have shown up in California, Massachusetts, Nevada, Utah and Arizona—definitely outside the Mississippi River basin. Moving zebra mussels there had to involve humans, who can usually be relied on to do the wrong things too much of the time.

And if you're working on a river that has problems with zebra mussels, consider the latest invasive working its way up the Mississippi system—the snakehead. You won't want a bunch of those on your doorstep. ♦

themselves on important wild aquatic plants, or native imperiled mussels. Black carp are now regularly captured in the lower Mississippi River basin and elsewhere.

Silver carp and bighead carp are unequivocally a true menace. Throughout their lives, they feed on plankton, and directly compete with native fishes that need the same nutrient-rich food, especially so at the juvenile stage. After escaping wastewater treatment and aquaculture facilities, and swimming their way up the Mississippi River and into the Illinois River, these alien invaders now knock on the door of the Great Lakes. This proverbial door is an electric barrier built by the U.S. Army Corps of Engineers to prevent the exchange of aquatic nuisance species between the two great basins: the Mississippi River, and the Great Lakes. A canal system, constructed over 100 years ago to flush Chicago's wastewater down river to the Gulf of Mexico, connects the two basins.

As bighead carp and silver carp invaded the Illinois River, they were first noticed in the 1990s by commercial fishermen, and then natural resource agency staff. It wasn't long before the fish had taken over and become the most numerous fish in the Illinois River. In some surveys, these invaders comprise 95 percent of a day's catch. The fish invasion continued and Asian carp inched closer and closer to the barrier. The U.S. Fish and Wildlife Service's LaCrosse Wisconsin Fish and Wildlife Conservation Office has monitored the carp advance since 2001, via its annual "Carp Corral and Goby Roundup." In recent years, the Corps of Engineers, Illinois Department of Natural Resources, and U.S. Fish and Wildlife Service have closely monitored carp populations near the barrier using traditional fishery techniques, such as netting and electrofishing. A lack of catch near the barrier seemed to indicate that Asian carp were not finding the upper river and canal habitats to their liking, and their advance was slowing.

Enter "environmental DNA." It's a technique refined by scientists at the University of Notre Dame, used to determine if the DNA from an organism, in this case silver carp and bighead carp, exists in a water sample. The technique is quite sensitive in its ability to detect the presence of the target organism, by testing the water. While traditional gears told fishery managers that the Asian carp front had miles of river and two dams separating it from the electric barrier, environmental DNA told biologists that Asian carp, or at least their DNA, was near, and sadly, past the barriers.

As DNA was found closer and closer to the barrier, and eventually a single bighead carp was captured directly downstream of the barrier with free access to challenge the barrier, the wheels in Washington turned toward solutions. A multi-agency "Asian Carp Summit" was held at the White House in conjunction with Senate and House testimony and concurrent with a related Supreme Court lawsuit. The result was the Asian Carp Control Strategy Framework, a multi-million dollar, multi-agency, multi-tiered approach to keep Asian carp out of the Great Lakes.



U.S. Fish and Wildlife Service biologists Vince Mudrak and Sam Finney examine a bighead carp captured in the flooded Mississippi River. Photo: USFWS

Since then, the electric barrier's operation settings have changed. A second electric barrier has been constructed and testing is underway. Commercial fisherman on contract are working downstream of the barrier to reduce Asian carp populations. The fewer fish out there, the less likelihood of fish challenging the barrier. Biologists continue to monitor waters above and below the barriers for potential Asian carp. The entire fishery over a three-mile stretch of the Calumet River was examined by rotenone, a plant-derived fish toxicant, in May 2010. No Asian carp were found. On a bigger scale, biologists are identifying other pathways by which Asian carp may invade the Great Lakes. Physically dividing the two great basins, as they naturally once were, has become a legitimate option.

Still, questions remain. Are there enough fish living past the barrier to establish an Asian carp population in the Great Lakes? Is a population already established? Will Asian carp flourish in the Great Lakes, as they have in the Mississippi River basin?

One thing is definitely known. We need to keep Asian carp out of the Great Lakes. Asian carp DNA has been found and a single specimen has been captured on the lake side of the barrier; these findings have come about from intensive fishery work on the water. Many are cautiously optimistic that few fish exist above the barrier. With the management actions currently prescribed, few Asian carp, if any, will find their way into the Great Lakes in the future. ♦

Sam Finney's story originally appeared in Eddies, a free quarterly magazine published by the U.S. Fish and Wildlife Service. See www.fws.gov/eddies.

Knock, Knock! Who's There?

Invasive 50-Pound Leaping Fish

by Steve Johnson

A great flood washed through much of the Mississippi River region in 1993 and it wasn't long after that there were reports that two species of Asian carp, bighead carp (*Hypophthalmichthys nobilis*) and silver carp (*Hypophthalmichthys molitrix*) had escaped from fish farms in several southern states and were now active in the lower Mississippi River. These two species had been around in small numbers, but by 1994 they were showing up in a lot of new places.

And the new kids on the block played rough. Voracious plankton eaters, they outcompeted native species in a hurry. They grow fast and can weigh 60 pounds or more.

Silver carp are disturbed by the sound of boat motors and leap into the air. Imagine your river's biomass is suddenly 95 percent invasive carp, half of whom weigh 50 pounds and can jump 10 feet in the air. Imagine being in a boat trying to motor up the river with these big fish flying at you.

Managers on the Upper Mississippi got worried, talked to legislators and members of Congress, talked to agency leadership, warned of dire consequences if those fish spread to the upper river.

But nothing happened.

Years passed, and bad news got worse. These troublesome fish were getting closer, and opportunities to stop them were falling away.

As the population exploded in the Illinois River, a third of all boats in use there sustained damage from leaping fish. Dozens of people were injured. Efforts



Heidi Keuler stirs up the silver carp population on the Illinois River. Photo: USFWS

accelerated to keep Asian carp from entering the Great Lakes via the canal in the Chicago area that connects the Illinois River with Lake Michigan.

On the Upper Mississippi, more meetings were held.

The Mississippi River has 29 locks and dams between St. Louis and Minneapolis, but only three of them—two in Minneapolis and one in Keokuk in southeastern Iowa—are tall enough to be a fish barrier. And with locks through them, any fish capable of swimming alongside a boat can easily move on upriver.

While an electric barrier was constructed in the canal near Chicago, nothing much happened on the Mississippi. Bighead and silver carp moved north of the Keokuk dam.

A few bighead carp were netted in the St. Croix River in 2011 and 2012. That's 447 miles upriver of Keokuk. Fifty miles farther up the St. Croix, silver carp DNA was detected on two occasions in 2011. Just upriver of where the DNA was found is a 59-foot tall dam at St. Croix Falls, Wisconsin. No Asian carp have been detected above that dam.

Silver carp DNA has been detected even further up the Mississippi—above the Ford Dam and the Upper St. Anthony Falls Dam in Minneapolis, the two dams that could be barriers if the locks weren't used. Above Minneapolis there's no navigation and therefore no locks. The next dam upstream, Coon Rapids, is being rebuilt with state funds obtained primarily to block Asian carp. The bad news: silver carp DNA was detected above the 13-foot-high Coon Rapids Dam in 2011.

The lower Mississippi doesn't get a lot of recreational use. T.S. Eliot called

it a "great brown god" and it sees mostly barge traffic. So the proliferation of Asian carp has ruined some sport fishing and some recreation, but the impact wasn't huge.

But the Upper Mississippi National Wildlife and Fish Refuge, which runs from Wabasha, Minnesota to Dubuque, Iowa, gets more recreational visitors than Yellowstone National Park. And speaking of national parks, the Mississippi in the Minneapolis-St. Paul area is a recreational treasure designated by Congress in 1988 as the Mississippi National River and Recreation Area. The St. Croix, meanwhile, is one of the original eight components of the National Wild and Scenic Rivers System. The lower 25 miles of the St. Croix is heavily used for boating recreation—so much so that boaters pump \$25 million a year into the area's economy.

River managers now have the attention of legislators, and the news media. Citizens are angry and demanding action. If the carp get into the recreational lake country of northern Minnesota and northern Wisconsin it could seriously impact the region's tourism economy.

But what to do?

An electric barrier in the lock at Keokuk remains a viable option, but it would need to be studied and designed carefully, which can't happen overnight. And Congress would have to fund it, which isn't a certainty in the current political climate. And it can't happen by shifting funds away from the Chicago barrier.

Building an electric barrier at Keokuk seems a little like closing the barn door after the cows got out, considering the bighead and silver carp are already through the gate. But there are other invasives heading north that could be stopped there, including black carp and the evil-looking snakehead.

Barriers at the mouth of the St. Croix or on the main Mississippi at the Hastings Dam would protect much of the region in Minnesota and Wisconsin, but those rivers are too large for barriers, whether they were electric or experimental acoustic bubble barriers.

River managers are asking recreational boaters in 2012 to avoid using the locks as much as possible. The locks are free to anyone who wants to pass up or down river, and much of the traffic is barges taking mid-America's grain to world markets. But a lot of the lock use is recreational and much of that could be avoided. The fewer times the locks open, the fewer fish will pass.

Research isn't sexy, but it is essential and has been poorly funded. The search is on for some sort of biological bullet that will kill one species and not others. Legislators in 2012 have been willing to increase funding for research, and that's a start.

The history of invasive species in North America isn't pretty, from English sparrows and rock doves to nutria and kudzu. Society generally doesn't win these battles once the invasive species becomes established. But part of the challenge today is to slow the critters down while buying science time to find an answer. ♦

Welcome New RMS Members

Professional

Ericka Pilcher, Visitor Use Project Specialist
NPS Denver Service Center, CO

Paula Capece, Natural Resources Program Manager
Chattahoochee River National Recreation Area, GA

Nancy Arkin, Program Leader
Bridger-Teton National Forest, WY

Ed Williams, Basin Planner
DENR Division of Water Quality, NC

Ed Councill, CEO
kidsGROWkentucky, KY

Alison Bullock, Community Planner
NPS Rivers, Trails & Conservation Assistance, TN

Mark Carter, Environmental Biologist
Federal Energy Regulatory Commission, GA

Susan Walker, Hydropower Coordinator
National Marine Fisheries Service, AK

Organizational

Cate Huxtable, Stewardship Coordinator
American Canoe Association, VA

Mitchell Reid, Program Director
Alabama Rivers Alliance, AL

Associate

Jenna Gatto, Corps Member
SCA - River Town Outreach Corps, PA

Jeff Malik, Project Leader
SCA - River Town Outreach Corps, PA

Student

Ryan Brown, Graduate Student
Central Washington University, WA

Invasive Species – Who Cares?

by Frederick W. Schueler

*National Hotel & Suites Ottawa
February 28, 29, and March 1, 2012*

There's no place where Canada's constitutional complexity is more evident than in the creation and implementation of biosecurity measures to prevent, eradicate, or suppress invasive alien species, since the arrivals of these species are largely unanticipated events that require immediate action closely tailored to a local situation, and fragmented bureaucracies generally respond poorly to unanticipated problems.

After the 1992 Convention on Biodiversity forced the federal government to formally take general notice of the question of invasive species, Environment Canada convened a National Workshop on Invasive Alien Species in Ottawa in 2001. At that meeting, it was evident that the general Canadian constitutional question "is it a federal or a provincial responsibility?" had metastasized, as departments and agencies that were already dealing with some aspect of the invasive species question at each level of government defended their territory, and divided up responsibility for invasives by taxon or situation, rather than coalescing into a single organization that could have dealt with the problem in a unified way.

After this meeting, federal, provincial, and territorial Ministers for Wildlife, Forests, and Fisheries and Aquaculture called for the development of a draft plan to address the threat of invasive alien species, and approved a 'blueprint' for a National Plan and requested the creation of four thematic working groups to advance the 'blueprint' including: Aquatic Invasive Species; Terrestrial Animals; Terrestrial Plants; and, Leadership and Co-ordination. In 2004 this resulted in "An Invasive Alien Species Strategy for Canada," which called for prevention of new invasions; early detection of new invaders; rapid response to new invaders; and management of established and spreading invaders by containment, eradication, and control. (Gov't of Canada 2004)

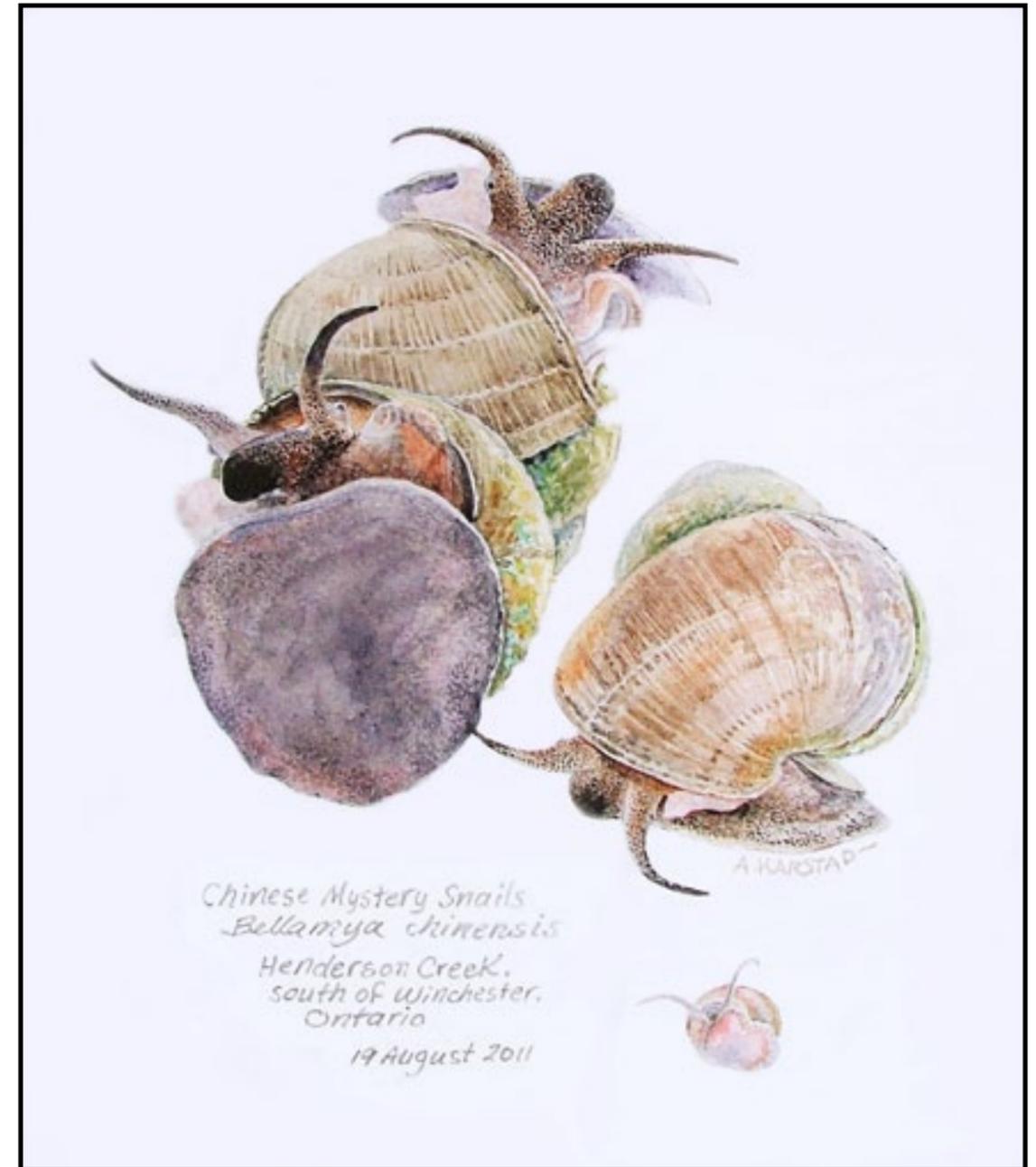
In my report on the 2001 meeting, I had commented that "The emphasis on economically important 'pests' was so strong that most of the species we've worked with: roadside, streamside, and forest plants, Crayfish, Amphibia, and terrestrial and aquatic snails and slugs, were scarcely mentioned." (Schueler 2002). Since then, just to mention some efforts I've been involved with, the public/private partnership between the Ontario Ministry of Natural Resources, and the Ontario Federation of Anglers and Hunters has provided publicity and a reporting portal for many of the streamside plants, Crayfish, and aquatic snails, as well as fish and zooplankters, while the Canadian Food Inspection Agency has supported the completion of the late Wayne Grimm's book on introduced terrestrial snails and slugs (Grimm, et al., 2009), so there has been action in providing identification guides and reporting opportunities. But the complexity of actual action, taken soon enough to extirpate new arrivals, still depends on

the initiative of individual workers on the ground, who happen to recognize the problem and to be embedded in, or have some influence with, a responsive agency, taking action against a new discovery. A example of the usual situation comes in a recent e-mail from a Quebec colleague "Last summer (2011) we [he and his wife] caught some *Orconectes rusticus* at a new 'invasive spot' (head of a watershed). We did put this information in a report. Nobody cares..."

Over the years, part of this vacuity of action has been filled by provincial "councils" mostly dealing with invasive plants, and early this year, all of their mailing lists were given four weeks notice of a National Invasive Alien Species Forum in Ottawa. This event was announced as "a special opportunity to network and collaborate with colleagues from across Canada on topics including prevention, and early Detection and Rapid Response." The notice had been sent out only a month after the forum was conceived, and it was being publicized mostly through the provincial invasive plant/species councils, because the main idea of the forum was to launch a national invasives council. I attended representing the CRMS, and to see how things had progressed since 2001. Since it was mostly plants councils that called this meeting, there was a definite bias in the coverage toward Plants and their Insect pests. Earthworms, terrestrial Molluscs, and Crayfish were scarcely mentioned, so my reflections are mostly on process, rather than on specifics of particular riverine species.

The first two days of the forum were presentations and networking (everybody I sat down next to was working on something relevant to something I was doing), and the third was concurrent workshops on "Building National Collaboration" and "Managing 'Invasive' Information in Canada." More than 140 individuals attended, when the organizers had only expected 70 or so – obviously they didn't recall the crowd who had thronged to the 2001 meeting. The whole thing was pretty satisfactory and well planned – especially since it had been organized in two months from British Columbia – but the meeting space had to be scaled up to accommodate the crowd, a horrible sound system blurred all voices, and horizontal video screens for the overflow corners of the room made all female presenters look pregnant and all male presenters unpleasantly stout.

Among the presentations, the most astonishing were those of regulatory bureaucrats, many of whom read a series of slides showing the chain of legislation and regulation that leads to their position... and then stopped, without saying anything they or their group has done. One wonders if this is a strategy to bore invasive species to death? Is government possible without boredom? Is boredom in speaking compatible with a vocation? Are models of risk really helpful, or are they just a way to kill time before being forced to take action? But the story about invasive species is the least boring story imaginable... And then we have a collaborator speaking, and what he says is suddenly very interesting. Is this because he's actually doing something, or because he's a friend



Mystery Snail watercolour by Aleta Karstad

or because he's a scientist? The few exceptions to the above pattern suggest that, if they're to have useful accomplishments, bureaucrats must be cynical about the framework in which they work, unless the framework is sincere all the way down, which is apparently infrequent.

The one project I'll mention by name, as perhaps being worthy of imitation, is Project UFO: Preventing Invasive Species in Atlantic Canada, motivated and led by Dr. Katherine Jones, of Cape Breton University. UFO (Unidentified Foreign Organisms) combines public outreach (accompanied by charmingly animated gifs) with serious scientific research. One wonders to what extent this kind of scientist-led publicity would work outside the relatively intense population of the Maritime provinces. She also delivered the invasive horror story about a new species that

one always hears at such meetings – in this case the dolorous Japanese Dragonworms, which clog up the swimbladders of already-threatened American Eels - http://projectufo.ca/drupal/Eel_Workshop

The provincial/territorial councils all seem to be on the ball, within the scope of more conventional anti-invasive actions: providing eradications, information, and alternative horticultural species, and scanning the internet for material they can borrow from each other in order to avoid the reinvention of the wheel. Several of these councils are in the process of generalizing themselves into invasive species councils. None of these are, however, to be named from what they're striving for – "Biotic Integrity Councils" or "Biogeographic Integrity Councils" – rather than from the invasives they're struggling against.

Networks of centres and workers are just getting underway, at the largest scale the newly formed North American Invasive Species Network, which is barely present in Canada, and the Canadian Aquatic Invasive Species Network of university professors doing expensive research. At the provincial level Ontario has an Invasive Species Research Institute at the newly launched Algoma University, and a nearby Ministry of Natural Resources Invasive Species Centre, in Sault Ste. Marie. British Columbia admitted to having been sort of dragged into the Columbia River Agreement with Columbia basin states to take action against boaters bringing Dreissena mussels and other disasters into this basin, and to doing much less than many of the states in inspecting trailered boats from outside the basin, and Quebec expressed bemused frustration at federal unwillingness to deal with invasive Tunicates imported into Quebec waters on a federally-chartered vessel.

There was an often-repeated theme of the lesser cost of preventing introduction or of initial eradication compared with long-term control, but it was accompanied by accounts of squabbling among agencies as to who would – or finally failing to – pay these lesser costs.

Presentations on Early Detection, Rapid Response (EDRR) implied successes across all agencies, but with almost no examples given, and with the writing of a policy often counting as success. I wouldn't have thought we'd have needed to hear about the details of individual plans until we'd heard that there'd been some success – and even if plans are untried, we need to hear how they're derived from successfully rapid responses, or how they've been formulated to compensate for patterns of

failures. The BC Inter-Ministry Invasive Species Working Group, for example, has just had their first early detection of the invasive Reed, *Phragmites australis* ssp. *australis*, 8 years after the first account of its presence in the province (Schueler, et al 2003), but they can't get the regulatory ducks in a row to mow down either the patches we found in the Okanagan Valley, or the newly discovered stand east of Vancouver. It's very easy not to introduce a species once, but success means doing this uncounted thousands of times without loss of enthusiasm or concentration.

The riverine invasives that were mostly emphasized were the Asian Carp and the threat they pose to the Great Lakes. The theme of not having any overall biosecurity policy was most glaring in this case, since the border folks weren't authorized to actually stop this most-feared invasive at the border, but had to detain the would-be importers with idle chitchat until Ontario Conservation Officers could arrive to enforce a provincial ban on importation.

Another theme, by the provincial invasive plant councils, was reaching out to the horticulture industry, including a spate of 'Grow Me Instead'

manuals. Banning invasive species is a well-understandable idea, since the concept of forbidden products is familiar, and the only novelty was the idea that these particular species ought not to be sold just because they're such fine plants that they get away into the wild. One got the impression that horticulturalists are more responsive to eliminating invasive species from their offerings than garden pool and aquarium suppliers are – but the Grow me

(continued on page 30)



"Andrewsville Shells" painting of Zebra Mussel invasion, by Aleta Karstad (oil on canvas, 5 x 8 inches)

Partnerships Achieve Watershed Restoration By *Engaging* Young Adults

by Mike Wight

It's a brisk early morning in March on the Colorado River. Steam makes its way skyward as the first light hits the water. Thirty people cinch up life vests on shore as BLM River Manager Troy Schnurr pulls up with his boat. Excited faces look downstream in expectation of a new experience as passers-by wonder at the mountain of unusual gear piled on the many rafts. Chainsaws, large water-tight containers and hard hats adorn the vessels, ready for deployment downstream.

This is the fourth year of three conservation/youth corps collaboratively training for a two-month season where they will be accomplishing restoration objectives as part of the Dolores River Restoration Partnership. Young folks from the region and beyond have recently completed an S-212 chainsaw course, first aid, CPR and classroom herbicide training. Partnering with Troy and the BLM on the Ruby-Horsethief section of the river allows for a hands-on experience working on tamarisk control, herbicide application training, river safety and paddling skills. Add to that: education on the partnership; tamarisk leaf beetle; river stewardship; working with public land management; and, of course, some good old fashioned hard work. For many corps members, this is their first experience on a river, and one that will set the stage for a season of raft-supported restoration work on the Dolores River, once snowmelt from the San Juan



Youth corps training trip in March on the Colorado River.

Troy Schnurr, BLM River Manager, lines out the crews. Photos: Mike Wight



Mountains surges downstream.

Employment for young adults continues to be a challenge in the country. However, throughout the Southwest, increasing numbers of young adults are completing important project work to enhance and restore riparian systems. Modern conservation and youth corps programs, based on Roosevelt's Civilian Conservation Corps of the post-

depression era, seek to engage members in service on public lands. By partnering with collaborative watershed restoration initiatives, an avenue for addressing multiple issues has emerged.

In recent years, a focus towards watershed health on many levels has gained attention in the national and international arena. For most of us the reasons are obvious: global climate change, shifting weather patterns, and an uncertain future for global water resources. Couple these concerns with a growing human population, water quality issues, storm water and sewage treatment challenges, environmental pollution, and one can start to foresee the challenges ahead.

The importance of watershed health has caught the eyes of federal, state, and local government, land management agencies, non-profits, environmentalists, and notably, federal funders and private foundations. There is a surge of energy towards restoration and reclamation of watersheds, especially

in the arid Western United States. Here, the scarcity of water and the impacts from woody invasive species such as Tamarisk and Russian olive are widespread. The negative implications for native animal and plant species, along with humans, are many. The need for a competent workforce to address these effects for the benefit of the natural world and the health of our riparian corridors is particularly important

if we are to succeed in the battle with invasive species to improve and protect existing resources for future generations. For this reason, partnering with corps programs creates a win-win situation.

In the Conservation/youth corps world, the prevalence of partnership is a given. Corps partner with land management agencies, State and National Parks, and other non-profits as a matter of course. These partnerships create the basis for what corps do. The benefits are many: providing a workforce, completing an important project, creating jobs, teaching skills, impacting lives... and the list goes on. These benefits do not go unnoticed.

In the western United States, many partnerships have solidified around projects that benefit watershed health. An important component in much of this momentum has been the Walton Family Foundation's (WFF) Freshwater Conservation Initiative. The Foundation employees the term "Conservationomics"—the idea that the conservation solutions that will last are the ones that make economic sense. The basis of the initiative is the belief that efforts to protect and restore the environment can and should bring economic prosperity to local communities.

By funding collaborative efforts in the Colorado river basin such as the Dolores River Restoration Partnership (CO/UT), Escalante River Watershed Partnership (UT), Verde Watershed Restoration Coalition (AZ), Virgin River SWFL Collaboration (NV), WFF supports the engagement of local young adults and area contractors to complete projects. Initiatives like these bring together agency specialists, private contractors, environmental organizations, county and state employees, ranchers, citizens, non-profits (such as the Tamarisk Coalition), Youth/Conservation Corps, private funders, and more. The purpose of these partnerships is to gather resources, combine forces, share information, learn from each other, leverage funding, and work together to create a broad, unified effort with multiple benefits.

Collaboration in itself often extends individual resources and builds capacity for cross-boundary projects. This is especially important in dealing with invasive species and wildlife, which don't know the difference between private and public lands. The engagement of multiple agencies

assures broad resources for research and acquisition of funding (and match). Participation from ranchers, private land owners and area contractors helps localize conservation attention and benefit to the region. Develop a comprehensive plan based on the best knowledge and science available, and you have a recipe for success where tangible accomplishments can be achieved. Bring youth and young adults into the picture, and the benefits for future generations can start to be felt.

Corps crews on the ground typically work in small groups and tackle a variety of project types. As partners in broad initiatives, corps programs can often cater schedules and crew selection to the project and region. An 8-person crew can treat as much as 15-25 acres of dense Tamarisk or Russian olive in a season (often in remote locations), put up miles of fence, plant thousands of willows, and process massive amounts of biomass. Crews work incredibly hard and concentrate on safety, while gaining an appreciation for America's Great Outdoors.

Participants earn a living stipend or wage which is often circulated in the local and regional communities where they return. Through project work and education, corps members gain an appreciation for conservation projects and naturally outreach this in the region. Members (often at-risk or underserved populations) receive training, education

Herbicide application procedure.



and often an AmeriCorps Education Award for post-secondary education. Crews learn to safely wield chainsaws, apply herbicide, plant native species and other skills that can transfer to future employment. Through this process, increased confidence, strength, teamwork and work ethic are inherent.

Multiple corps programs often collaborate in watersheds to accomplish huge amounts of project work. Interaction and collaborative training improves the product on the ground and the empowerment of individuals, creating lasting effects and a holistic impact from watershed partnership efforts.

As the sun retreats from the canyon on day two of the training, corps members—tired from a day of hard work—wolf down dinner and enjoy the sandstone light show. The silence of the evening approaches, in contrast with a loud but productive day. Comments of appreciation and respect float through the air, borne on notes from Troy's banjo. It's a great start to a hard season, and an experience that will impact participants for years to come.

For more information on a wide variety of partnerships and corps programs in the Southwest, contact the author Mike Wight (970) 749-2796, and/or see the links listed below:

- Walton Family Foundation: <http://www.waltonfamilyfoundation.org>

(continued on page 30)

(Grand Canyon, page 4)



(Left) River Mile 70 along the Colorado River in 2007. (Right) River Mile 70 in 2010, after a dramatic invasion of Russian thistle. Photos: Amy Draut

the park, and only four of the eight native species remain in Grand Canyon. Non-native fish species prey on and/or compete with native fish, and in Grand Canyon, cold water released by Glen Canyon Dam may reduce the ability of native warm-water fish to escape predation by trout. Compared to rainbow trout, brown trout are particularly voracious predators of native fish; however, the magnitude of impact by rainbow trout upon native fish communities may be equal or greater than brown trout because of their much higher abundance in Grand Canyon. In addition, research indicates that both trout species consume similar foods as native species in the Colorado River where food production is low, resulting in potential competition with native fish.

Grand Canyon National Park is conducting a multi-year project to reduce the number of brown and rainbow trout in Bright Angel Creek. The purpose of the Bright Angel Creek Trout Reduction Project is to benefit endangered humpback chub and other native fish species in the Colorado River, and to restore and enhance, to the extent possible, the native fish community that once flourished in Bright Angel Creek. Bright Angel Creek once supported large numbers of native fish, including occurrences of the endangered humpback chub. Today, Bright Angel Creek is the main spawning site in Grand Canyon for non-native brown trout, and it is hoped that this project will also benefit native species in the Colorado River as well.

Biologists are using two methods for capturing and removing non-native trout in Bright Angel Creek during the fall and winter months: a weir, or fish trap, and electro-fishing. The weir captures adult trout as they enter Bright Angel Creek from the Colorado River to spawn. Electro-fishing allows fisheries biologists to monitor and assess the fish population of the creek and also remove non-native trout that live in the stream. Rainbow trout are also being controlled in Shinumo Creek in conjunction with a translocation of endangered humpback chub to the stream to provide the newly released juvenile humpback chub with the best possible chance of surviving.

These efforts to eliminate or reduce the impacts caused by the invasive and/or exotic tamarisk, blackberry, and trout, are not the only management actions taken by the Division of

Science and Resource Management in Grand Canyon National Park to preserve the ecological integrity of riparian ecosystems in Grand Canyon. The park's Watershed Stewardship Program, which was formally established in 2010, is taking a multi-disciplinary approach to identify conservation targets and threats and develop stewardship strategies. The Granite Camp-Monument Creek Pilot Stewardship Project, funded by the Nina Mason Pulliam Charitable Trust, will include rehabilitation of riparian communities through the selective removal of non-native tamarisk and restoration with native plants collected in the local area.

Chief of Science and Resource Management Martha Hahn said, "Control of invasive species is one of many resource management issues along the Colorado River that require integrated planning. We are working at the watershed level, actively engaging with park neighbors, keeping the public informed, and enlisting the assistance of volunteers to protect Grand Canyon from the damage caused by invasive species. One of our main objectives is to reduce the abundance of non-native species in riparian ecosystems and increase the quality of riparian habitats so that they are dominated by native species. The National Park Service has a mandate to preserve park resource unimpaired for the benefit of future generations." ♦



To learn more about volunteer opportunities to help control invasive plants in Grand Canyon:

<http://www.gcvolunteers.org/>
<http://www.volunteer.gov>

Bright Angel Creek Trout Reduction Project:
<http://www.nps.gov/grca/naturescience/trout-reduction.htm>

Humpback Chub Tributary Translocation Project:
<http://www.nps.gov/grca/naturescience/shinumotransloc.htm>

Loving Alaskan Rivers to *Death*

by Jeff Heys

Imagine an Alaskan river. What do you see? Clear or turbid glacial waters and expansive gravel bars framed by mountains and forest or tundra, perhaps, with no sign of other people? What do you hear? Only the sounds of the river and nearby animals, or do you hear a bush plane flying overhead? What do you feel? Solitude in the wilderness, I imagine. Thankfully, pristine rivers abound in Alaska and serve as time capsules of the way that rivers in other parts of North America used to be.

Several years ago, I was given the opportunity to float the upper Noatak River in the Brooks Range above the Arctic Circle. With a wilderness specialist colleague, I searched every gravel bar for invasive plants from near the headwaters in Gates of the Arctic National Park

and Preserve to just upstream of Noatak National Preserve. I am happy to report that we could not find a single non-native plant along nearly 30 river miles. While this may come as no surprise to you, it did surprise me. The Noatak is a world-renowned recreational river, with visitors from many countries each summer. A single dirty boot or tent from somewhere else is all that it would take to begin a permanent alteration of this magnificent river.

Human impacts on streams and rivers in Alaska are typically concentrated around settlements and isolated in extent. Low population density, lack of road access, and protected status are likely to preserve this situation across much of the state into the near future at least... with the exception of invasive species impacts.

Because they reproduce and spread, once invasive species are introduced, they can quickly become widespread and cause permanent harm. Unlike other impacts on rivers, it is river users that are generally responsible for the introduction of invasive species through a variety of mostly unintentional pathways.

The first invasive species to be noticed affecting Alaskan rivers was white sweetclover (*Melilotus albus*). Sweetclover was introduced to Alaska as a potential forage crop but was abandoned for this use many years ago. In the meantime, it spread extensively along Alaska's highway corridors, thriving in roadside gravels all the way from Southeast Alaska to the Brooks Range. Where rivers pass beneath those roads, sweetclover jumped to riverbar gravels,

especially where people access those rivers at boat launches, campgrounds, or fishing sites, for example. White sweetclover has now overtaken enormous areas of gravel bars along three glacial rivers: the Stikine in Southeast Alaska, the Matanuska in Southcentral, and the Nenana in the Interior. Research has demonstrated that dense sweetclover inhibits the growth of native riparian plants, but little else is known about its ecological impacts. Nevertheless, covering what would under natural circumstances be a sparsely vegetated gravel bar with tall-growing, dense, nitrogen-fixing plants is bound to alter the floodplain ecosystem. We just don't yet know how it will do so, apart from visual impacts: it looks out of place to experienced Alaskan river users, and a bear

would be less apparent amid the tall plants. The best measures for preventing the spread of white sweetclover to new rivers in Alaska include controlling roadside sweetclover in the vicinity of river crossings, keeping clothing, gear, and vehicles clean of debris, and avoiding vegetated areas while preparing to use a river.

A relatively new and major concern for Alaskan rivers is aquatic invasive plants of the genus *Elodea*, commonly known as waterweeds. Two years ago, two U.S. Forest Service biologists decided to try out a newly-published guide to aquatic plants of Alaska. While floating the Chena River through downtown Fairbanks, they happened to pick up a single free-floating piece of non-native waterweed. It took some time to trace this single unusual find to its source: an upstream tributary of the Chena River known as Chena Slough, which was found to be heavily infested over much of its length with *Elodea nuttallii*. This discovery was followed by the identification of several infested lakes, not only in Fairbanks but also in Anchorage and Cordova, including lakes used by floatplanes to access remote waters. If *Elodea* continues to spread, its

impacts on slow-moving rivers in Alaska will be severe, since it grows densely enough to hold a canoe paddle upright (*pictured*) and could therefore reduce recreational and property values. In addition, it can slow water flow, increase



Dr. Tricia Wurtz demonstrates that invasive *Elodea* plants in Chena Slough grow thick enough to hold a canoe paddle upright in Fairbanks, Alaska. Photo: Nicholas Lisuzzo, USDA Forest Service

sedimentation, dramatically alter aquatic habitats, and even reduce spawning habitat for king, also known as Chinook, salmon. Efforts are now underway by many cooperating groups to control existing infestations, prevent their spread, and survey for *Elodea* in other waterbodies, although far more remains to be accomplished towards these goals. *Elodea* was likely introduced to Chena Slough when someone dumped an aquarium there, since these plants are commonly sold in the aquarium trade, and this small amount of plant material led to what is now a dense, 8-mile-long infestation.

While northern pike (*Esox lucius*) are native to Interior Alaska north of the Alaska Range, they have been widely introduced to Southcentral Alaska lakes by anglers who prefer to fish for pike over native fish species. As predators of salmon and trout that readily spread to connected streams and rivers, they are considered invasive beyond their native range in Alaska. The Alaska Department of Fish and Game, with assistance from the U.S. Fish and Wildlife Service, is actively managing northern pike across this region through containment, eradication, and education strategies

designed to protect valuable fisheries. Alexander Lake and Creek, just northwest of Anchorage in the Matanuska-Susitna Borough, provide an unfortunate example of the impacts of northern pike. There was once a thriving king salmon fishery in the watershed, but as a result of the introduction and establishment of pike throughout the system, the king salmon runs diminished to the degree that the lodges were forced to close and guides moved their operations to other river systems. Because Alexander Lake and Creek are an open system, as opposed to lakes that do not connect with other surface waters, eradication using the piscicide rotenone would be nearly impossible. Instead, expensive, annual control netting would be needed to bring the king salmon back

to a level that would sustain a fishery. Fishery managers on the Kenai Peninsula to the south are making concerted efforts to avoid the fate of Alexander Creek by preventing pike from moving from lakes into the Kenai River and its tributaries, which host enormously valuable salmon and trout fisheries. While introducing fish to new waters in Alaska is illegal, this law is very difficult to enforce. Education is critical for reaching the "bucket biologists" responsible for pike introduction to Southcentral Alaska. The Kenai River has seen other invasive species arrive as well. Picture a family barbecue, a crawfish boil in particular, on the riverbanks, and a couple of well-meaning kids asking to "save" a few of the live, imported crawfish (also known as crayfish or crawdads) by releasing them into the Kenai River. In this case, the animals were caught and removed from the river, but in another with uncertain origins, invasive crayfish were discovered by a student on Kodiak Island in Buskin Lake, which drains into the Buskin River. This is a developing story, with uncertainty surrounding the potential impacts of these competitors and predators on Alaska freshwater food

The Upper Noatak River, free of invasive species and virtually any other human impact, flows through Gates of the Arctic National Park and Preserve in Northern Alaska. Credit: Jeff Heys, National Park Service



chains, but the lesson is clear: *river users need to understand that it is never a good idea for anyone, other than a trained biologist with permission, to release a living organism into a waterbody, including live bait.*

The Kenai is also one of several regions of Alaska with focused efforts to manage reed canarygrass (*Phalaris arundinacea*), an invasive plant that may be a little too good at its intended job of erosion control. Unlike native riparian grasses, reed canarygrass forms sod along riverbanks, growing down into the channels of slow-moving rivers and streams and thereby slowing water flow, increasing sedimentation, and degrading fish and wildlife habitats. Reed canarygrass has become widespread in many parts of Alaska, and eradication is no longer an option. Instead, long-term management strategies are being developed to minimize the damage it causes. A far cheaper, simpler, and more effective alternative is known as early detection and rapid response, whereby small infestations are discovered by recurrent monitoring or volunteer reports and swiftly eradicated. To illustrate, a single infestation of purple loosestrife (*Lythrum salicaria*), a species that causes similar impacts to those of reed canarygrass, was found in Alaska in 2005 and has been eradicated through consistent annual control efforts. This attractive garden plant also serves as a reminder that one's own backyard can be the source of problems for rivers.

Recognizing the threat of invasive species, the Alaska Board of Fisheries took an important step in 2010 by becoming the first state to ban the use of felt-soled waders for recreational sport fishing in fresh waters. Among a vast array of tiny plants and animals that can be easily transported within the felt voids are New Zealand mudsnails (*Potamopyrgus antipodarum*) and whirling disease (*Myxobolus cerebralis*), each of which can severely impact salmon and trout. Even species native to certain parts of Alaska can be harmful if introduced beyond their native ranges, such as "rock snot" (*Didymosphenia geminata*), a diatom considered to be a major problem in other regions of the world. Along with education and enforcement activities, the prohibition of felt soles could block the flow of invasive species arriving in Alaska through a narrow but critical pathway. Similar regulations and educational campaigns could block the flow of invasive species along other pathways, such as the trailered boats that can transport invasive zebra and quagga mussels (*Dreissena polymorpha* and *D. rostriformis bugensis*) over long distances. Over shorter distances, contaminated heavy equipment and fill materials used for infrastructure or restoration projects can also be the source of new problems for rivers. Hygiene is the name of the game for preventing unintentional introductions of invasive species across all manner of river uses and management activities. For more information about prevention practices, visit www.protectyourwaters.net.

Ironically, it is frequently our love for rivers or living organisms that leads to the introduction of invasive species and unintentional harm to objects of our love. Who would make this choice with awareness of the consequences? It is incumbent on river users and managers to learn and teach one another about invasive species, their importance, and ways to prevent their introduction and spread. With awareness, vigilance, dedication, and cooperation, it is yet possible that the rivers of Alaska may continue to serve as time capsules for future generations, preserving knowledge and experience of the nature of rivers before they were substantially and irrevocably altered by people. ♦

NFCT Signage for Paddlers



(See article on right.)



Developing Consensus

for Paddler-Specific Aquatic Invasive Spread Prevention Signage

by Walter Opuszynski

The Northern Forest Canoe Trail (NFCT) is a 740-mile canoe/portage route through the northern forest. The NFCT passes through New York, Vermont, Quebec, New Hampshire, and Maine. Within this area the NFCT traverses 22 rivers and streams, 56 lakes and ponds, cutting through 15 watersheds. Use of this recreational corridor ranges from day trips to through paddles (expeditions starting in Old Forge, NY and ending in Fort Kent, ME). Because there is a large population of paddlers taking extended trips and transitioning between waterbodies and watersheds, it has been a priority goal of the NFCT stewardship program to educate paddlers about aquatic invasives. With an understanding of the challenges that aquatic invasives present to our ecosystems, it is easier to introduce and adopt a protocol that will help paddlers to keep from being a vector for spread. To educate paddlers we decided to focus our efforts on developing a clearinghouse on our website and creating signage to use in the field of two types—back-country/low profile signage and front-country/high detail signage. To have effective signage we needed to have the images and text endorsed by three main groups: paddlers, land/river managers, and aquatic invasive experts. (See signage on left hand page.)

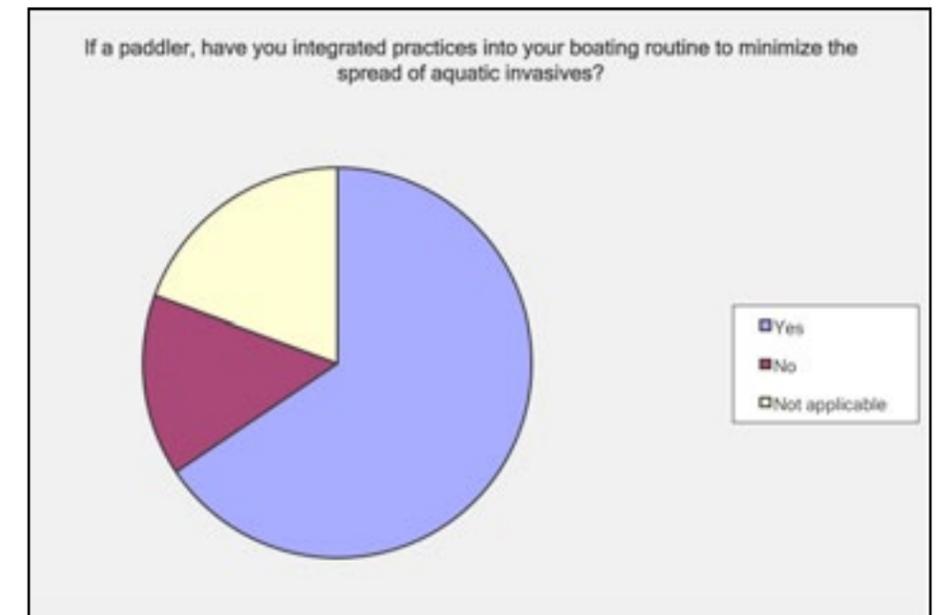
To create a process that would allow these three groups to participate in the development and review of the message we contracted the facilitator Landslide Natural Resource Planning to help create and guide a diverse work group and develop and implement a survey targeting our three priority audiences. The work group created the initial message based on the most recent aquatic invasive spread prevention protocol developed by the Aquatic Nuisance Species Task Force. Our contracted graphic designer then matched images to the text. The produced signage was dissected for evaluation in a survey sent to over a dozen distribution lists, both national and regional. The survey was taken by 162 respondents. Of those, 79% considered themselves paddlers, 21% aquatic species experts, 41% land or water managers, and 4% did not affiliate with

any of the above groups.

The feedback from the survey was evaluated by the work group and changes were made to the signage to create an effective message that paddlers would be able to implement in the field using protocol that would help stop the spread of aquatic invasives. The next step of this project is to determine the exact placement

of the signage and secure permissions for installation. This project would not be possible without the support of the Lake Champlain Basin Program. For more information about this project or to receive digital files of the signage, contact Walter Opuszynski, NFCT Trail Director at walter@northernforestcanoetrail.org or (802) 496-2285 ext.2. ♦

Sample of Survey Results



A Japanese Invasive on the French Broad River in North Carolina

by Mary Crockett

The 2012 Symposium offered a “Give Back to the River” session on Friday morning (April 27th) for conference attendees. Five River Management Society (RMS) members met up with two RiverLink employees to work on a riparian section known as Sculpture Park on the French Broad River located in the arts district of Asheville, North Carolina. The French Broad River begins its flow toward the Gulf of Mexico in the mountains of North Carolina, near Rosman, and runs through the city of Asheville before it moves into Tennessee. Our task for the morning was to learn about an invasive weed and provide labor for the mechanical removal of this invasive plant species. The invasive plant is Japanese knotweed (*Fallopia japonica*), an aggressive, fast growing, perennial plant that can reach heights of ten feet each growing season.

This deciduous tall herbaceous shrub reproduces by seed and vegetative (rhizomatous and stoloniferous) means. It flowers during the summer growing season, thus the management of this weed is most effective during the early spring and summer months, before seed dispersal.

Successful control of this plant depends on weakening the root system of existing plants, containing all plant parts, and eliminating annual seed production. It requires a combination of physical removal and systemic herbicide application with multiple treatments throughout the growing season, because Japanese knotweed grows



Japanese knotweed. Photo: Dave Russell, RiverLink

so quickly. Physical control such as hand pulling, mowing, or clipping is conducted both before and after herbicide application in order to increase shoot to root ratios and therefore increase plant susceptibility to the herbicide. We learned that the best time to use the herbicide is when the plant is actively growing, but before re-sprout grows too high (under 1 meter tall) and before seeds are produced. RiverLink has a suggested Japanese knotweed management plan which recommends using a glyphosate herbicide such as Rodeo at 96oz/100gal/acre with a surfactant that is rated for riparian use. RiverLink had already sprayed one time this spring before we arrived to help with the mechanical removal. Thus, the plants were dying or dead, brown or rust in color, and slightly bent over near the top of the plant.

This species also spreads vegetatively, thus care has to be taken when disposing of plant parts. The tubular structure of the stem allows even small pieces of Japanese knotweed to float and thus travel readily through waterways colonizing new habitats along the way. To avoid spreading the plant during physical removal, we placed the plant parts in a bag and placed the bag on a concrete slab to bake and die in the sun. We also placed dried, dead plant parts in a large disposal container that will be taken to a class “D” landfill for permanent disposal; making sure that roots, as well as stems, are thoroughly dried to ensure kill before allowing materials to have contact with soil

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L to R: Volunteers Jeff Malik, Jenna Gatto, Glenn Cox, Mary Crockett, and Ken Ransford dug up Japanese knotweed and filled more than 30 bags. Photo: Jenna Gatto



(Tamarisk, page 1)

website designed to advertise riparian restoration training opportunities, efforts to improve the availability of native plant materials for use in riparian restoration, monitoring of the tamarisk biological control agent and distribution of field results, and project management of a restoration effort in Grand Junction, Colorado.

TC has been hosting annual symposia and research conferences since 2001, with topics ranging from invasive species control methods and revegetation techniques to the benefits and challenges of working in watershed partnerships. Next spring, TC is pleased to collaborate with River Management Society to conduct a week-long Research Conference in Grand Junction, Colorado. The March 11 – 14, 2013 event will bring restoration practitioners, land managers, researchers, educators and many others from across the West together in a single venue to share information and present on the most current research and best management practices. This event will enable partners of RMS and TC to make new connections, share information, and learn from one another throughout the week.

Supporting the greater restoration community of land managers, consultants, scientists and others by helping compile information and attempting to bridge gaps and needs has long been a niche that the TC takes pride in filling. One of our newest projects is a product of our desire to step in and fill these types of needs. When professionals in the restoration community voiced a need for a central web portal advertising continued education and training opportunities, TC responded by launching the Riparian Restoration Connection (RRC), www.riparianrestorationconnection.com. This online hub links riparian restoration practitioners working on rivers of the West with all of the key local trainings and events most useful for improving success. The website includes information on conferences, seminars, hands-on trainings, workshops, equipment demonstrations,

and volunteer events. Specific topics include: selection of plant materials and planting methods, secondary weed management, native and invasive plant identification, monitoring of riparian restoration sites, grazing in riparian areas, riparian restoration research and lessons learned, and training pertaining to improvement of collaboration and



Jesse Lanci, TC, sweeps tamarisk to check for the presence of the tamarisk leaf beetle on the Navajo Reservation in Arizona. Photo: Kelle Urban, Tamarisk Coalition

connection with peers. Our primary focus is on events dedicated to facilitating restoration success on western rivers impacted by woody invasive plants, however, the variety of topics covered in the events posted on the RRC are relevant to the much broader riparian restoration community!

Another project through which TC strives to connect practitioners to the best available resources is the native plant materials development program, which aims to increase the availability of appropriate types of plant materials that can be successfully established following the removal of woody invasive plants. TC is currently working with regional plant materials centers, many of which are operated in coordination with the Natural Resources Conservation Service, private nurseries, and a private landowner to grow native stock in a variety of

methods. Through the fostering of these new partnerships, TC aims to increase the sustainability of riparian plant production for riparian restoration. To date, this effort has been focused in western Colorado.

In addition to gathering and disseminating outside information and resources, several of our internal projects lend themselves to data collection as well. One example is our tamarisk biological control monitoring program. Following the US Department of Agriculture’s release of the tamarisk biological control agent, the tamarisk leaf beetle (*Diorhabda carinulata*), there was, and still is, much uncertainty of the potential impacts of the beetle (both positive and negative) to riparian systems due in part to their ability to defoliate large stands of tamarisk and disperse across watersheds fairly quickly. Such defoliation has the potential to alter many parts of the riparian ecosystem including flow regimes and erosion, wildlife diversity and abundance, wildlife habitat, and the likelihood of wildfires (Bateman et al. 2010). TC decided to help promote education and research on the subject in an effort to help land management agencies get

the information they needed to understand these potential effects. In 2007, TC and the Colorado Department of Agriculture –Palisade Insectary recognized the need to expand existing monitoring efforts outside of Colorado and developed a landscape-scale monitoring program. Monitoring efforts consist of sweeping tamarisk with cloth sweep nets and counting individual beetles, assessing percentage tamarisk defoliation and noting other dominant vegetation in the immediate vicinity. The data gathered are used to inform land managers and restoration practitioners, through outreach efforts, of the presence and potential impacts of the beetles and to garner public and private support for some localized efforts to enhance native plant communities in areas where defoliation will potentially impact the endangered Southwestern Willow Flycatcher (flycatcher).

(continued on page 29)

The Envelope Please...

2012 RMS Award Recipients

by Jorjena Daly

This year proved to be yet another full of individuals deserving acknowledgement for all they do to help preserve, restore, protect, and manage the opportunities afforded on our national river systems!

As RMS President Dennis Willis put it, "The RMS Awards are the highest form of recognition given by RMS. The award process is unique because some awards are open to non-RMS members. They are also the highest form of peer appreciation. The nominations and the selection process all come from peer professionals. Award recipients are held in high esteem and recognized nationally for their outstanding achievements in managing our nation's rivers."

The 2012 RMS awards committee, once again, had no easy task of reviewing nominations for many worthy award candidates. After careful review, we provided our recommendations to the RMS Board, who announced the winners during a recent ceremony at the 2012 River Management Symposium in North Carolina.

Paul Nordell, otherwise referred to as "Minnesota Rivers' Best Friend," was recognized for the 2012 **Contribution to River Management** award. Paul has dedicated 24 years to empowering thousands of people to become active river stewards. Since the late 1980s, Paul Nordell has been coordinating the Minnesota Adopt-a-River program and inspiring citizens. To date, program accomplishments include: 3,000 cleanups, over 10,000 river miles cleaned up, 285,000 volunteer hours from 2,800 volunteers, and over SIX MILLION POUNDS OF GARBAGE REMOVED.

Each year, Paul also invites an artist to participate in river clean ups to gain inspiration and create a sculpture of found objects which then becomes a featured exhibit at the State Fair. Additionally,

Paul coordinates an experiential education activity for the Big River Journey, which combines river cleanup and classroom work on a paddleboat excursion. Over 50,000 4th-6th graders have participated



The RMS 2012 Contribution to River Management award went to Paul Nordell, also known as "Minnesota Rivers' Best Friend."

since 1994. They learn about river stewardship from Paul in the Crime Lab. Dressed in a lab coat with a crime scene full of river trash, Paul directs students to discover what the trash is, where it came from, and solve the mystery of who is responsible for the waste being in the river. Paul also works with Project WET partners to reach out to educators, and he helps watershed districts, interest groups, and other community organizations to network with each other and protect their own communities. Moreover, he annually organizes an Earth Day cleanup of a neighborhood near the Mississippi River that includes multiple partners.

Paul provides endless creativity, passion, and a genius to weave together methods to engage a person's sense of place as inspiration to use what they already have within themselves and their communities to care for their rivers.

The 2012 **Contribution to the River Management Society** award recognized the financial team duo, Lee Larson and Ken Ransford, otherwise referred to as "Architects of RMS' Finances." Ken and Lee have worked tirelessly to enable RMS to grow our capacity in recent years through a financial system transition. They repeat their mantra to 'not sweat the small stuff.' In fact, CPA Ken professes that accounting is just like washing your clothes: "All you need to do is to learn to put your socks in the sock drawer!" It is delightful for the RMS membership to have access to both men, who view their otherwise Herculean financial system transition performed for RMS with such modesty. RMS will forever benefit from the time and talent they donated to this effort.

The 2012 **River Manager of the Year** award went to Jennifer Jones, River Manager for the Colorado River through Westwater Canyon and the Dolores River in Utah. (See photo on page 3.) Jennifer has also served as treasurer for the Southwest Chapter for three years and was instrumental in carrying out the 2010 River Ranger Rendezvous in Green River, Utah. Though very busy running the river permitting program for Westwater Canyon, the Colorado River Daily Run, and the Dolores River in Utah, which collectively see over 500,000 annual visitors, she consistently works to maintain excellent relationships with permitted outfitters and has developed numerous partnerships. The partnerships benefit both river resource as well as its river runners.

Jennifer has spearheaded cooperative



Lee Larson (left), RMS Treasurer, and Ken Ransford, RMS Financial Advisor, are honored in North Carolina with the RMS 2012 Contribution to the River Management Society award. Photo: Bunny Sterin

Rebecca Wodder, Senior Advisor to the Secretary at Department of the Interior, and Erik Wrede, Minnesota DNR, accept the Contribution to River Management award on behalf of Paul Nordell. Photo: Bunny Sterin



invasive species control efforts that have promoted and already improved river campsite conditions. As a primary instructor for BLM's national recreation permit course, she has shared her knowledge and experience widely and become a leading authority on the permitting program that regulates commercial river operations. Jennifer has played a key role in developing innovative solutions to increase recreational river access to disabled military veterans.

A sincere thank you to our 2012 awardees for all that you've accomplished for our nation's river resources!

A Call to Serve! This Rewarding Committee Requires Very Little Time!

Before the award nominations came rolling in this year, the awards committee said farewell and thank you to past committee members, some who served over 5 years! We also welcomed new committee members: Susan James (Forest Service/NW Chapter), Jay Krienitz (Minnesota DNR/Midwest Chapter), and Jason Carey (River Restoration/SW Chapter). These new members, together with existing committee members from Washington D.C. and Alaska have helped to round out representation across the country. We could still use more representation on the committee regardless of where you're from! The awards committee has a goal to increase regional representation specifically in the Southeast and Pacific areas as well as diversify affiliation across private, state, federal, and non-profit membership.

Please contact Jorjena Daly, Awards Committee Chair, to learn more and get involved! What could be more fun than encouraging nominations for others and learning about all the fine accomplishments of your peers and ensuring they receive deserving recognition?!◆



Join other river rangers on the Blackfoot River for 2½ days of hands-on experience and discussion geared specifically for river rangers and the challenges they face in the field!

The event will be held at the University of Montana's Lubrecht Experimental Forest, near Missoula, MT, and on the river.

RRR Topics include:

- Techniques to improve public contacts and ranger safety
- Social media
- Float camping
- Leave-No-Trace
- Law enforcement
- Current river-related issues and management strategies (e.g. ethics and etiquette, human waste management, invasive species)

RRR Registration includes camping/showers and meals.

- \$100 for RMS Members
- \$150 for Non-RMS Members (includes a one-year Professional Level RMS membership)

There will be a 2-day Swiftwater Rescue Technician course offered (June 18 & 19) for an additional \$195. A manual, test, patch, ID card, and certification through the Whitewater Rescue Institute (WRI) are included. Camping at Lubrecht is also included for this course.

If you have any questions, please contact Chet Crowser: (406) 542-5562 ccrowser@mt.gov

Midwest by Peter Hark

In early April I had the chance to pull the canoe down and take a leisurely paddle on a portion of the Cannon River not far from where I live. Part of this was driven by the spring itch after ice melt to dip the paddle and dust off the boat; and part of this was in celebration of my 50th birthday. The sunny 70 degree weather with good friends and family was a good start to the paddling season and an excellent way to celebrate life!

The Midwest chapter has been fortunate to be steadily growing in its membership numbers, is working to host a fall paddle for our region, is networking with various prospective organizations in order to leverage and work towards the goals set by our national organization, and we are very fortunate to have some very dedicated folks serving as chapter officers.

In Minnesota, a new citizen's advisory committee to assist the DNR's water trails program was recently formed. DNR Commissioner Landwehr has endorsed the concept of using citizens for input and outreach on a variety of DNR program efforts. Currently, the new committee is made up of 13 members, with wide-ranging experience and interest in river recreation issues. Included are retired former heads of DNR river programs, current and former nonprofit leaders of river efforts, university water education professionals, and folks with longtime legislative backgrounds.

After having an initial introductory meeting in March, the committee already has seen one of their ideas to promote water trails come to fruition. The committee is planning a "Water

Trails Day" event to promote awareness of the state's 4,400 miles of mapped routes managed for canoeing, kayaking, boating and camping. It is also an effort to reinvigorate what was called the "Governor's Canoe Day" from 1983-1992. The DNR has declared July 14th of this year as the state's official day for this event. It will be held along the Mississippi backwaters in Winona. The DNR Commissioner will be attending, and Governor Dayton has been invited.

Initially, the committee plans to:

1. Develop a statewide network of existing and new Water Trail user groups, and build user group capacity.
2. Provide advocacy and outreach for water recreation and stewardship.
3. Promote best management practices (BMP's) on Water Trails and at Public Water Accesses.

The increased focus on river recreation and conservation is nationwide. The U.S. Department of Interior has an extremely strong focus on river revitalization, championed by Secretary Ken Salazar. Both of Interior's America's Great Outdoors (AGO) projects in Minnesota are river-based – the metro Mississippi River and the Upper Minnesota River. One will likely become a National Water Trail and the other a National Blueway. Both have community partnerships as a key element. With new federal level interest, combined with efforts like what is happening in Minnesota with the new Water Trails Advisory Committee, we see a much greater potential to have positive impact with our river programs. Providing

more access and opportunity, while combining important conservations efforts, has great opportunity and challenge for us all. ♦



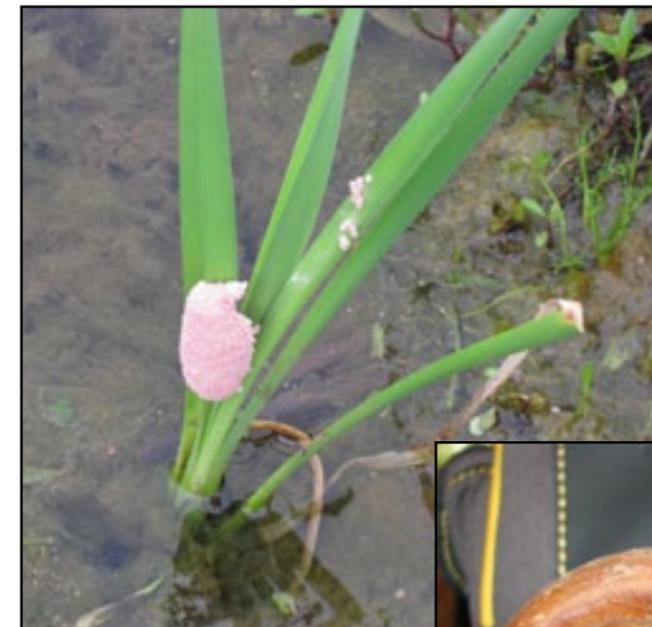
Southeast by Mary Crockett

Wow, as I write this I am only one day back to work after experiencing the 2012 River Management Symposium. I would like to thank the many volunteers and sponsors who helped to make the week so enjoyable. Our SE Chapter definitely enjoyed hosting this meeting in Asheville and the plan is to devote the next RMS Journal to the Southeast and the symposium. We will try to include stories showcasing the highlights of the many topics and issues discussed, including the float/hiking trip information.

However, the issue you now hold in your hands is focused on aquatic invasive and nuisance species, so I will expound on this topic for just a bit and then refer you to the rest of this issue.

As river managers, we monitor many different aspects of the riverine habitat and one of the issues many of us face is that of invasive species. As a river manager, I record GPS points and report my findings and issues concerning aquatic nuisance species (ANS) to our ANS program manager. In the Southeast many of the state and federal agencies have devoted a source of funding and staff to address this large issue. In my state of South Carolina we have many invasive plants and animals, some have been here since before European discovery and others have found their way here recently. In South Carolina, the principal focus of managing ANS has been directed at nuisance aquatic plants, exotic mussels and snails, as well as exotic fish. Historically, non-native species have been introduced to South Carolina through direct stocking, aquascaping, shipping, aquarium releases and bait releases. Some species also "hitchhike" on boats, motors and trailers. South Carolina spends several hundred thousand dollars per year

managing invasive aquatic vegetation threats alone, while the state of Florida spends more than \$20 million. In 1991, an



Vivid pink applesnail egg mass.

invasion of the aquatic weed hydrilla shut down the St. Stephen hydroelectric plant on Lake Moultrie for weeks, costing \$4 million in lost productivity and \$526,000 worth of gamefish deaths. A recent invader found in many of our storm water retention ponds near residential areas is the highly invasive island applesnail, *Pomacea insularum*. This species is now found or introductions have occurred in Texas, Florida, Georgia, and South Carolina. These snails are a tropical/subtropical species, not normally known to withstand water temperatures much below 50°F. However, they can withstand short periods of cold by burrowing into the muddy bottom of a waterbody. They are the most commonly introduced species in the southeastern US. Their egg masses, about 1½ to 2 inches in length

with up to 1000 eggs not much greater than 1/16th of an inch in diameter, are easily distinguished because they are pink to almost red in color, and are found attached to various hard substrates above the water line, including pilings, concrete water control structures, tree trunks and many types of emergent vegetation. The potential impacts of introduced populations of the island applesnail (IAS) are broad reaching and can even have human health implications. They eat a wide range of aquatic plants and infestations can be very dense covering large areas, causing harm to the aquatic environment



Applesnail (*Pomacea insularum*). Photos: ANS Program, SCDNR

by destroying native plant species and drastically affecting the food web through their ability to kill or out-compete native snail species. Human health threats are also associated with this species. Although unlikely unless consumed, it has been shown to be a vector for disease and parasites such as the rat lungworm, which can cause fatal eosinophilic meningoencephalitis disease in humans. Eosinophilic meningoencephalitis is caused by a variety of helminthic infections. These are worm-specific infections named after the causative worm

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Alaska by Melissa Blair

Alaska's felt-soled wader boot ban is now in effect. As of January 2012, sport anglers can no longer wear absorbent fabric or felt-soled wading gear in Alaska's freshwaters. This first-of-its-kind statewide measure was boldly adopted by the Alaska Board of Fisheries in 2010, in hopes of stopping invasive New Zealand mudsnails, zebra and quagga mussels, and whirling disease from hitching a costly ride to our popular (and remote) rivers and lakes. I'm sporting new felt-free wader boots this summer, are you? Of course, wader boots are only one way invasive species can head north to Alaska. Fishing, boating, and recreational equipment that has been used out-of-state should be properly cleaned and decontaminated, as you'll learn throughout this Journal issue. If it's predictable, it's preventable.

Don't miss "Loving Alaskan Rivers to Death," a great article by Jeff Heys, U.S. Fish & Wildlife Service. With surprise and relief, he discovered something wonderful along the Noatak River in Gates of the Arctic National Park and Preserve and Noatak National Preserve. ♦



Melissa Blair's retired, re-purposed, felt-soled wader boots in full bloom. Read the press release online: www.adfg.alaska.gov/

Upcoming Alaska Chapter Activities

2012 River Workshops

Planning is in progress for multi-day workshops on the Susitna and Chulitna Rivers in July and August.

Alaska Recreation and Parks Association Conference

*October 11-12, 2012, Anchorage
BP Energy Center*

We will once again partner in this fun and educational event. Presenters and planning volunteers are needed. Contact: Bill Overbaugh at boverbau@blm.gov

Chapter Officer Elections in August

David Schade (Alaska DNR) will run for President, and David Griffin (Alaska DNR and current Chapter VP) will run for Vice President. Volunteers are needed for the offices of Secretary and Treasurer.

EPA Announces Task Force to Create National Environmental Education Plan

The White House convened an Environmental Education Summit on April 16th bringing together a diverse group of stakeholders to discuss the importance of environmental education and the core concepts and principles that contribute the most to environmental literacy, including panel discussions with environmental education leaders, remarks from several Administration officials and a panel on the Federal government's on-going commitment to the field of environmental education.

You can view a sampling of the presentations at:
Part 1: <http://www.youtube.com/watch?v=Ko9iraBEw3o&feature=relmfu>
Part 2: http://www.youtube.com/watch?v=iWGDMysjDic&feature=youtube_gdata

Following the summit, the Associated Press Reported that Maryland Congressman John P. Sarbanes said that environmental education must be a national priority. Sarbanes added that research shows hands-on, outdoor environmental education helps student performance not only in science and math, but also in reading and social studies. The nation must invest in environmental education to meet economic and energy challenges, as well as protect the environment. Sarbanes also sponsored legislation to authorize federal funding for outdoor educational activities.

The Environmental Protection Agency also announced the creation of a federal task force to help create a national plan for environmental education, co-chaired by the Departments of Education and Interior. ♦

Northwest by Lynette Ripley

Hello River Fans!

What is the good word from the Northwest? Summer is around the corner so that means getting outside to play and work on our gorgeous rivers! We have some fun and exciting events to share with you, so mark your calendars!

New Northwest Chapter Secretary

As the seasons change, so do people and plans. We have a new and fresh Northwest Chapter Secretary to replace Burkett Kniveton who resigned. Our new Secretary is Ryan Turner from Idaho. Check out his bio as written by him. We are pleased to have him join our "Dream Team" of officers! Welcome Ryan!

2012 River Ranger Rendezvous (RRR) in Missoula, Montana

Come One, Come All to the 2012 RRR (June 20-22) on the Blackfoot River. And don't miss the two-day whitewater rescue course before the event (June 18-19). This RRR, hosted by RMS' Northwest Chapter, is open to *all* River Rangers across the United States. This is a great opportunity for River Rangers and agencies across the country to gather and learn from each other and leaders about how to work with on-the-ground daily challenges as you make a career in river management. Whether you are a River Ranger or would like to be, this rendezvous is for you! See the RRR flier in this journal issue for more details. A Big Wave Thank You to Chet Crowser and his RRR committee for organizing an A+ event!

2012 RMS Northwest Chapter River Trips For You

Lower Deschutes River Trip (September 21-23)

Look for the registration details and forms coming in June, 2012. We'll boat 40+ miles of up to Class IV whitewater on this fun Wild and Scenic River in Central Oregon. Maximum 16 people. Cost will be less than \$100 and include free government housing/camping before and after the trip, food for three days and shuttle service. September is a gorgeous time of year on the Deschutes!

Payette River Trip (July or August) near Boise, Idaho!

Stay tuned on the RMS website for more details. ♦

BLM River Ranger, Ryan Turner



Welcome NW Chapter Secretary!

Thank you for the opportunity to join the River Management Society's NW Chapter Board as Secretary. My passion for rivers began growing up on the banks of Colorado's only Wild and Scenic River, the Cache la Poudre. I worked as a commercial raft guide on the Poudre for nine years before getting my Bachelor's of Science in 2009 in Natural Resources at Colorado State University. Following graduation, I completed an internship through the Student Conservation Association with the US Forest Service on the Klamath River in California. During this internship I joined RMS, and was determined to find a job protecting, managing and working on rivers. RMS really helped me succeed in achieving that goal. In 2010, I joined the Bureau of Land Management as the lead river ranger on the Lower Salmon. This position is a dream for me, allowing me to do hands-on work on a significant river, helping to ensure that it is enjoyed now and protected for future generations.

When I'm not working or playing on the river I enjoy backpacking, skiing and photography. I was lucky to have some of my photos chosen for the RMS Wild and Scenic Rivers Display Project in 2011. While I have yet to attend a chapter event, I know that my passion and "in the field" knowledge of rivers will help me be an asset to the NW Chapter Board and our membership. I very much look forward to being a part of the team and meeting members with the same passion and enthusiasm I have for our rivers. ♦ ~ Ryan Turner



Check Out the New RMS Website!

Have you visited www.river-management.org lately?

by Risa Shimoda

If you have in fact been to the new website, we hope you've taken a bit of a look around. Getting used to a change in our means of communicating to you as a member and managing online transactions that were once conducted manually is exciting for us at RMS, and we are anxious to explore its new capabilities as we go forward. Here are a few items that are in place:

Your Profile: The new site allows you to manage your personal information, or profile. As your office, job or mailing address changes you can change your profile instead of filling out a form and waiting for us to update your profile.

Promoting Events: You can post an event of interest to other river management professionals in your chapter or beyond quite easily. Go to the 'Meetings and Events' tab and fill out the RMS Event Calendar Posting Form. We will review and post your event within 24-48 hours.

Receiving Announcements and News and Collegial Discussion: We believe our

listserv process has been improved, for articles are now archived automatically and can be searched easily. In early May, messages were sent via the old system for the final time, and to receive messages going forward members now need to be signed up for the listserv or 'E-List' at www.river-management.org.

Some of you would like to receive news and announcements, and would rather not see the job postings and listserv questions and responses from members about river-management issues. Others of you don't mind the listserv traffic. In the past, you had no choice but to receive all or none of the email from RMS. Now you have a choice. As a current member, you will receive news digests, organizational announcements and press releases: you don't need to do anything to receive these.

If you would like to participate in the listserv and receive messages as they are distributed:

- Go to www.river-management.org, and log in with your username and password
- Go to Member Profile from the drop down menu or My Profile from the 'Welcome' page, and click on 'My Features'
- Click on the '+ Subscribe' link and in the window that pops up enter the email address at which you'd like to receive listserv messages (even if it is the same

as your username email). You are set, and can unsubscribe at any time. You can visit the listserv archive at the 'RMS Listserv' link under the 'Subscribed E-Lists Name.' You'll see recent posts and can search for posts of interest by typing your topic of interest into the 'Search' window.

As you receive listserv messages in your Inbox, they will appear online. Since this is a moderated listserv, there may be a lag time between when you post a message or a reply to a message and when it is posted - we'll try our best to keep the lag time low! If you have troubles, contact RMS at rmsmoderator@river-management.org or (301) 585-4677.

Job Board: As an RMS member, you are always welcome to send position announcements via the listserv! There's a limit to the life of an email position description, however...like only a few days. While we provided an option to post positions for the duration of the acceptance period, we found that most announcements were not posted to our job board, minimizing the value of the service as a resource.

RMS has entered a partnership with a service that will bring a wide variety of pertinent job postings to us, increasing the value of this service to you and your colleagues. The RMS Job Board is open to all members, and we think you will enjoy seeing what's out there from time to time, whether or not you are seeking professional change!

Employers who would like to post jobs for both members and a variety of external audiences can do so for a fee. These are explained and offered through a variety of packages. If you are seeking new opportunities you can also post your resume (we won't tell our supervisor!). Let us hear from you.

Please visit the site, get your profile up to date, and subscribe to the listserv to remain connected with your River Management Society colleagues. Feel free to let us know how the site can serve members like you more fully, and alert us to articles you feel need attention or improvement. ♦

Thank you for moving into the future with RMS!

(Tamarisk, page 21)

Data are also collected through our continued involvement in the long-standing effort to clean up and restore the Watson Island Complex, a former junkyard site located near downtown Grand Junction that was dominated by tamarisk, Russian olive and other riparian invasive species. We were asked to partner with the city of Grand Junction and other community partners to address these invasive plant issues and enhance wildlife habitat. In 2009, a Restoration Plan for the Watson Island Complex was developed by TC and consisted of general restoration guidelines using a wide variety of techniques including mechanical, hand-cut, and biological control methods. Since then, we have been fortunate to partner with additional stakeholders, including community volunteers, Western Colorado Conservation Corps, Colorado National Guard, and many others to help realize the original vision for the site, which included clean-up, invasive plant mitigation and wildlife enhancement. TC has also played an important role in community education efforts at Watson Island which serves as an outdoor classroom for the John McConnell Math and Science Center, local grade schools, and Colorado Mesa University.

As TC moves into its second decade, we are excited to be forming new relationships with organizations and individuals in an effort to bring the most up-to-date science to practitioners and land managers in the riparian restoration community. We encourage you to visit us at www.tamariskcoalition.org to learn more about the exciting programs and services TC provides to support riparian restoration in the West! ♦

(Japanese Invasive, page 20)

at the landfill site.

Our crew of five plus one RiverLink volunteer placed four large piles of dead vegetation into a container along with 50 bags that were previously allowed to sit in the sun for a few days, then we pulled, dug and bagged 31 new bags of Japanese knotweed all the time being very careful not to allow any of the weed's body parts to end up in the river. We left our bags to bake in the sun for others to place in the container on another day.

At Sculpture Park, RiverLink plans to continue this intensive and expensive cycle of spraying and removal of plants three or four times during a spring/summer season for up to three years. It is their hope that by the third year they will only have to clip a few remaining plants to the ground then let them grow to approximately one meter and apply the herbicide to kill them back on approximately 150 feet of riparian land. By the fourth year they hope to only apply herbicide to a few plants as needed. If RiverLink were to fall on hard times or abandon this management regime, the riparian bank of the river would once again be covered up with Japanese knotweed. Without a broader regional watershed eradication plan this weed will continue to thrive and spread. However, with continued vigilance, care, and a yearly management budget commitment, RiverLink will succeed in having 150-200 feet of riparian area along the north side of the French Broad River back in native vegetation for the visiting public to admire. ♦

(This article used information from RiverLink, written by Corinne Duncan as supplied by Dave Russell.)

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Mary Crockett and a Riverlink volunteer digging up weeds along the French Broad River. Photo: Jenna Gatto

(From the President, page 3)

younger and better looking people. There was also a suggestion about chapters having a River Steward position in each state to help with outreach and media. There was also discussion about making better use of social media. We heard those messages and are beginning action on a number of fronts. Expect to see a link to Facebook and Twitter show up on our website. Membership and media are both on the agenda for the next board meeting. I hope that if you get a call to work on one of these projects you will jump in with the enthusiasm that is characteristic of RMS members. ♦

(Canada, page 12)

Instead model might be something RMS might explore.

On the final day I attended the “facilitated” workshop on Building National Collaboration, which had to decide between a “Council-of-councils” of the provincial organizations, and a Canada-wide membership or stakeholder organization. After a few hours of angst, we came up with a bicameral combination of these two ideas, which we agreed will attempt to do a vast range of activities though having no assurance of funding. One of the things that was agreed to was my 2001 call for a dedicated and...

“...dispersed corps of observers, perhaps 10,000 in number. These dedicated ‘boogie-rangers’ would learn to recognize many potential and actual invaders, regularly report their absence from areas they haven’t reached, sample, identify and strive to eliminate or control invasives when found, answer public inquiries, and promote the issue of invasives to the public and the news media. Such observers would include volunteers, agency employees, academics, and students, and they should work with the enthusiasm of a volunteer fire department or Breeding Bird Atlasers to deal with whatever comes up. They would be supported by a wide range of good publications about invaders and their native relatives, a national communication network, a well-managed and accessible database of monitoring sites, support for museum collections, and a social structure that rewards and encourages dedication, enthusiasm, and accuracy.” (Schueler 2002). ♦

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(Youth Corps, page 14)

- Dolores River Restoration Partnership- <http://ocs.fortlewis.edu/drrp/> Daniel Oppenheimer doppenheimer@tamariskcoalition.org Youtube.com- Search “Dolores River Restoration 2010”
- Escalante River Watershed Partnership- <https://www.facebook.com/EscalanteRiverWatershedPartnership>
- Verde Watershed Restoration Coalition- Anna Schrenk anna.schrenk@verdewrc.org
- Virgin River Southwest Willow Flycatcher Collaborative- Deborah Campbell, Coordinator & Facilitator www.deborahcampbellandassociates.com
- Southwest Conservation Corps: <http://www.sccorps.org>
- Canyon Country Youth Corps: <http://www.fourcornersschool.org/canyon-country-youth-corps>
- Western Colorado Conservation Corps: <http://wcccpartners.org/>
- Utah Conservation Corps: <http://www.usu.edu/ucc/>
- Coconino Rural Environment Corps: <http://www.crecweb.org/home.php>
- Nevada Conservation Corps: <http://www.thegreatbasininstitute.org/programs/nevada-conservation-corps/>
- Rocky Mountain Youth Corps (Colorado): <http://www.rockymountainyouthcorps.org/> ♦

(Southeast - Applesnail, page 25)

genera. Worm parasites enter an organism through ingestion of contaminated water, or in this case an under cooked or raw snail “host,” and can eventually affect the central nervous system. These infections are potentially serious events leading to death, and diagnosis currently depends on limited molecular methods. Snails can also cause skin irritations, since they are also intermediate hosts to other associated trematodes (flukes). If you find or see one of these species, please do not handle specimens without gloves and never eat undercooked or raw snails.

In SC, we think the island applesnail did not get here naturally but was most likely a release of aquarium pets. Thus the take home message for us as river managers is to be constantly preaching and advertising the prevention message of the following:

- 1) Fishermen should never throw excess bait back in waterways and should always wash their catch at home.
- 2) Boaters who are moving from one waterbody to another should also carefully inspect their hulls and propellers for hitchhiking plants and animals.
- 3) Water-garden and aquarium enthusiasts should return unwanted specimens, like the island applesnail, to pet stores instead of turning them loose.

My agency, the SCDNR, has a web site devoted to this issue: www.dnr.sc.gov/water/aquatic ♦

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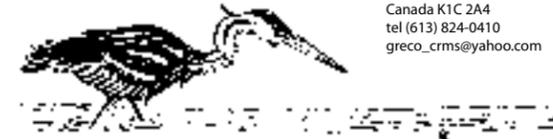
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Rivers you manage _____

Membership Category (please check one)

- Professional \$50/yr (\$200 for 5 years)
- Associate \$30/yr
- Organization \$120/yr (government/corporate)
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Next RMS Journal Deadline - SOUTHEAST FOCUS: Submissions due Aug 1, 2012.



Chet Crowser

June 18-19 – Swiftwater Rescue Training Course

June 20-22 – River Ranger Rendezvous Event

RRR Coordinator, Chet Crowser, and the Northwest Chapter of RMS invite you!
(See page 24 for details.)

