

Battling the invaders

PUBLISHER TOM WOODMAN talks with community leaders around the Adirondack Park.

An interview with
Hilary Smith
Director of the Adirondack Park
Invasive Plant Program

As director of the Adirondack Park Invasive Plant Program, Hilary Smith heads a cooperative effort to prevent invasive species from damaging ecosystems in the Park. With academic degrees in biology and biodiversity, conservation and policy, she has led the program since 2002.

The partnership of nonprofit groups and state agencies began in 1998 as a seasonal effort to prevent the spread of invasive plant species. It has since expanded into a year-round mission that includes campaigns against forest pests and other nonplant invasives as well as plants. The program works to inform the public about the threats of invasive species. Among other activities, staff and volunteers harvest invasive plants from lands and waterways and try to prevent their spread.

Why did you specialize in invasives?

Well, I've had an interest in the natural world since I was a child, so when I went to Hamilton College I knew I want-



Hilary Smith examines phragmites (common reed grass) near Saranac Lake.

Photo by Pat Hendrick

What makes it dangerous?

When I've had an interest in the natural world since I was a child, so when I went to Hamilton College I knew I wanted to study biology. I enjoyed studying at the community and ecosystem levels, rather than at the microscopic level. For my senior thesis, I went to my faculty adviser and said I'm looking for a project that has to do with human impact on the environment. He said, "Well what about invasive species?" That was back in the early nineties, and I really didn't know much about invasives. And when I was doing literature searches, not a lot was coming up on the radar. I think that was the foundation of my interest in invasive species, wanting to protect native biodiversity and realizing that there's this looming threat.

A friend of mine sent me this job description for the Adirondack Park, working on invasive species. It involved community education and ecological monitoring. To have those two responsibilities fit into one job description that was focused on invasives was just very appealing to me.

You said you were interested in the natural world from when you were a child. Where did you grow up?

I grew up in western Pennsylvania outside of Pittsburgh in a little town called Ligonier. It was a rural area, and we had about two acres and a lot of that was wooded, so I'd play in the backyard in the woods and the stream. And we'd take family vacations to different natural areas and national parks. It was Acadia National Park where I kind of attribute my first feeling of discovery—of critters and cool things that live in the ocean.

Had you been to the Adirondacks before you took this position?

When I was at Hamilton, we used to come up here and hike, and that was also really interesting to me. When I started this job it was focused on aquatics and wetland invasives, but I had associated my time here with the mountains and more terrestrial ecosystems. And it was

"It isn't about good plants and bad plants. It's about the natural balance that's disrupted"

exciting to learn about all of the lakes and ponds that we have here and the tremendous wetlands.

It sounds like a big part of your focus is to try to get people to understand why they should care about invasive species. Why should we?

As many people know, our existence is very intricately linked to natural resources, and when we look globally at some of the threats that these resources face, we see climate change and invasive species. Scientists have viewed invasive species as one of the top two threats to biodiversity. The first being habitat destruction. Some forest ecologists say invasive forest pests pose the greatest threat, even beyond climate change. It's more immediate. Particularly in the Adirondacks, where we have a six million-acre landscape that has unequalled bioresources, we have a lot to lose.

So I'm driving along the road and I see purple loosestrife and I think, Oh that's pretty. You would say pretty but dangerous?

Absolutely dangerous.

What makes it dangerous?

Generally invasive plants form monotypic stands. They will come into a system, and over time they can wipe out a lot of other native plants. We often talk about wetlands providing all these ecosystem services to us like water purification, filtration, absorbing flood waters, helping to prevent erosion, providing habitat for fauna. Those kinds of things are supported by vegetation that's growing there. So if you have one plant coming in and pushing out ten or more different species you're going to lose that wetland's ability to function as well as provide habitat for wildlife.

So that particular plant by itself may not be evil, but the problem is it becomes so dominant that you lose the diversity?

It's the plant out of place. The species we're dealing with are often not from the United States. They're from other geographic areas. They haven't evolved here over time. They were introduced accidentally or intentionally by people, and there are any number of different traits and conditions that allow them to become aggressive here. The definition of an invasive is it's not historically found here and it causes measurable economic, ecological, or societal harm.

If you were to take milfoil or loosestrife and see it in its own natural environment that would be fine? You wouldn't have anything against it?

Right. And I think that's an important point to make. It isn't about good plants and bad plants. It's about the natural balance that's disrupted. There are U.S. species that are invading European natural areas. So it's a two-way street.



HILARY SMITH, 50



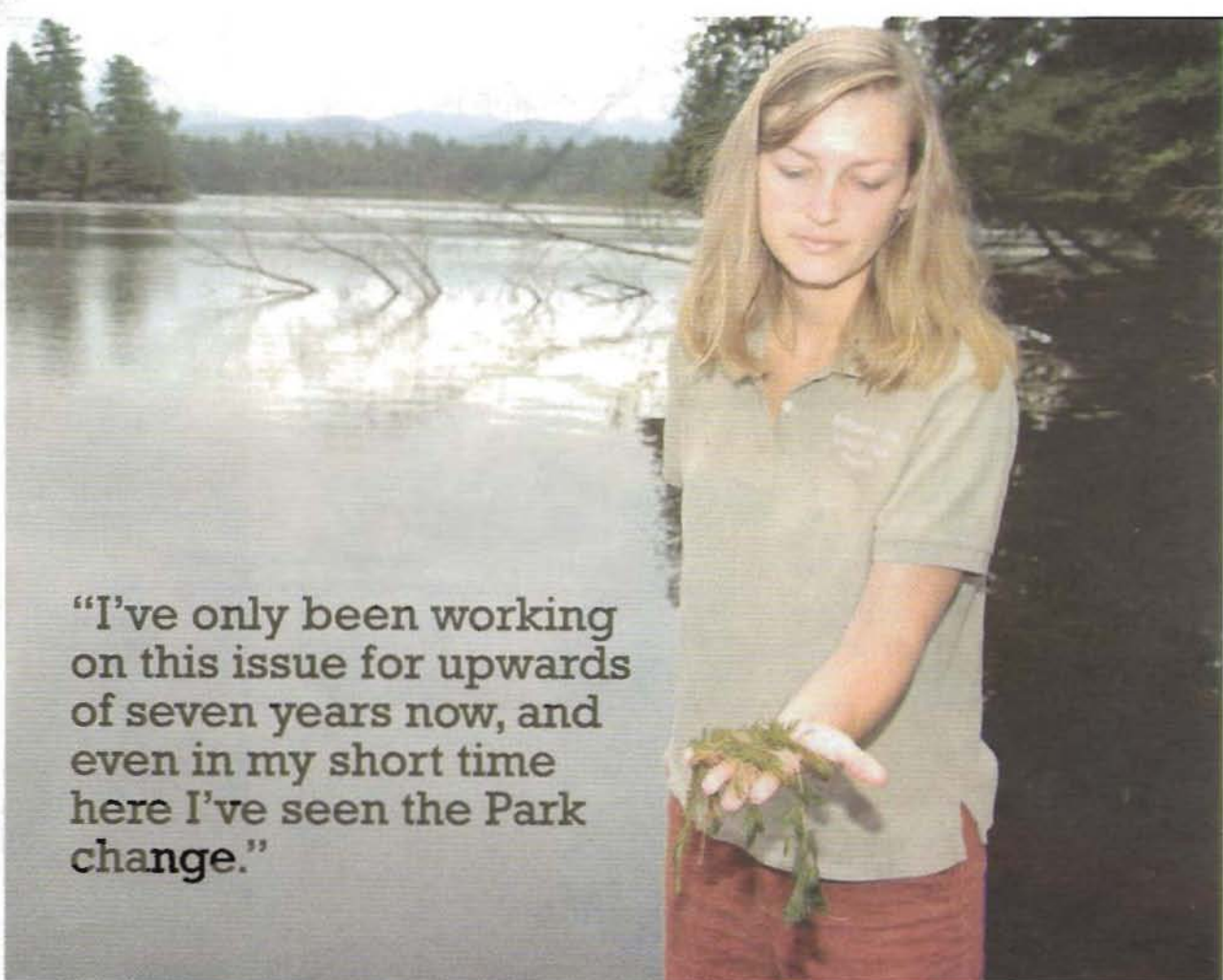
Purple loosestrife: pretty but destructive.

From Page 27 HILARY SMITH

This is not a natural development where some species just migrate and become dominant?

It's artificial, and the key problem is that the rate at which species are being introduced is accelerating. And the number of species that are being introduced is accelerating far greater than any natural expansion.

How? Why?



"I've only been working on this issue for upwards of seven years now, and even in my short time here I've seen the Park change."

Eurasian watermilfoil is a major threat to Adirondack Lake ecosystems.

And in fighting invasives, you also have to set priorities if there aren't enough resources to...

How? Why?

Because of people. Global trade. Global movement. We can ship anything anywhere. We travel everywhere. We can go on the Internet and purchase anything with very little regulation.

What's the scale of the problem? Is it really scary or more of an ongoing effort that's not an immediate crisis?

The scale of the problem is global. It *is* scary, and it's getting scarier. I've only been working on this issue for upwards of seven years now, and even in my short time here I've seen the Park change. We're doing a lot, but we need to be doing more. I think that it is an emergency.

How has the Park changed?

I think just in the numbers of infestations we're contending with. As we monitor terrestrial and aquatic invasive plants we have seen the exponential spread of terrestrial invasives species on roadsides and in hamlet areas encroaching onto Forest Preserve. We've seen an increasing number of lakes becoming infected with aquatic invasive plants. And certainly with forest pests there's been a lot in the news in this last year about emerald ash borer and Asian longhorned beetle. (See story on Page 22). And aquatic invasives like spiny water flea in Great Sacandaga Lake. It's very scary when you think there are thousands of boaters leaving that waterway, unknowingly taking spiny water fleas with them to any number of other waterways in New York State and beyond.

What do spiny water fleas do?

That is an invasive zooplankton [from Europe]. It's in the Great Lakes and is a voracious predator on other zooplankton and phytoplankton, which are at the bottom of the food web so that if you change that level it has cascading effects up the food chain. By nature of the exoskeleton being so spiny, fish can't readily feed on them and they provide little to no nutrients to the fish. It will make them feel full, but really it's just exoskeleton.

In a large lake like the Sacandaga how long does it take before it's a serious problem?

Courtesy of Invasives.org



Zebra mussels

I think it's a little too early for us to know. It was just detected in the fall of 2008.

Are invasives a threat now or to future generations?

It's different with each species. You know, purple loosestrife was introduced in the 1800s, and we're still battling the species and its impacts are still being recognized. Often, some of these species will be in the environment, seemingly not causing any impacts, and then that population will reach a point where you have exponential spread and you start to see it. And its impacts will be realized. Others, like emerald ash borer, you realize more immediately. Trees die within two to three years. The Midwest has lost millions of trees since it was first introduced in 2002.

Is the response adequate to the threat?

No. The response is not adequate to the threat at this point. But it's getting better. There are a lot of issues that the state has to contend with, and prioritizing those threats and their allocation of resources can be a struggle, and certainly in these economic times it's even more difficult. Luckily with invasive species we do have a few champions in the legislature that have been able to keep this issue on the radar despite cutbacks.

And in fighting invasives, you also have to set priorities if there are not enough resources to go around? You have to decide what the most serious issue is?

Absolutely. The way that we prioritize where we work and what we work on is really dependent upon how widespread the species is, what management techniques are available to us, and what the ecological attributes of an area are. Then we go from there. The plant species we're working on are still relatively isolated, small enough infestations that we can go in and control successfully. Others might be too far gone or they're contained to right of ways and they don't pose a threat to natural areas. We don't really focus on those. We'll focus on those that might spread down a stream bank or invade a wetland or move through the forest understory, preventing tree regeneration and things like that.

Do you also take into account financial impact?

At this point it's more ecosystem based. One of our partners, though, is the Department of Transportation, so they're involved because of the safety issues of having invasives in ditches or around signs and things like that. It's more safety and maintenance issues that bring them to the table. So we do balance both threats to infrastructure as well as threats to ecosystems.

If there's a threat that looks bad to tourists but doesn't have a real widespread ecological impact as opposed to something that does have that ecological impact but is off in areas where tourists aren't seeing it, how do you balance those things?

Again, our focus would be driven by ecological impacts, so we absolutely would be working in those areas even if they're unseen. Right now, a lot of these invasives are showing up where there is human activity or disturbance and so they are in public places. It could be a lake with public access or a roadside or a trailhead. That's often where invasives will get a toehold.

So is there an element not only of humans introducing a species but of human activity weakening the natural ecosystem and making it more prone to invasives?

Yes. That's a secondary question that does defi- ▶▶

nitely need to be evaluated. Certainly we know that lakes that have a lot of nutrient input through fertilizers or things like that see accelerated plant growth, and that applies to invasives also. Disturbance through a roadside project creates habitat that can be more readily invaded. That's why the Department of Transportation is working with us. They recognize that they've contributed to some of these challenges and they're working with us to try to come up with solutions.

What would you list as the biggest threats?

I'd group that in terms of the different categories of species we work on. For terrestrial plants, the ones we've been focusing on most are Japanese knotweed, purple loosestrife, garlic mustard, and phragmites. The ones that are just starting to get a toehold here are the swallow-wort vines, Oriental bittersweet, and giant hogweed. For aquatic invasive plants, we're working mostly on Eurasian watermilfoil. A new milfoil species, the variable-leaf milfoil, is making inroads as well.

That's the one they discovered in Lake Placid?

Right. Aquatic invasive species that we're concerned about that aren't plants include zebra mussels, the spiny water flea, and invasive fish. And with forest pests, the Asian longhorned beetle. The emerald ash borer is in the state, and it's probably just a matter of time before it works its way here.

It sounds like the Asian longhorned beetle could be more devastating than the emerald ash borer, but it may be not quite as imminent a threat right now.

No. I would say it's as imminent. The reason why we project it would have greater impact is because it affects more host species, and the reason why it's as imminent a threat is because there are infestations in Long Island and Worcester, Mass. Landowners come to the Adirondacks from those locations and visit campgrounds. Firewood is one of the main pathways for that species. It's hard to know whether or not they brought infested firewood with them, but the risk is there.

You hear talk about the emerald ash borer potentially wiping out ashes and the longhorned beetle devastating all hardwoods. How long would it take for us to see these effects if the pests were to make it to the Park?

Another good question with not a great answer. There aren't that many cases in natural areas where these pests have taken hold. Mostly they've been in urban and suburban areas, so we haven't been able to really estimate what

very strict, multiyear testing process in advance of releasing anything into the environment. I think purple loosestrife has had one of the best-studied and most effective biocontrols.

What would be the best thing to happen in response to invasives?

Better federal and state policies to stop invasives at our national and state borders. Focus on prevention. The next step would be to have an early-detection and rapid-response network at a national level and the New York State level. We already have an early-detection network here in the Adirondacks, but we're lacking a true rapid-response capacity. What we've been advocating for in the Adirondacks are spread-prevention programs at boat launches, using boat-launch stewards, and also funding for an aquatic response team and a terrestrial response team that would be able to work across the Adirondack landscape and respond to new infestations.

Who would be responsible for the response?

It depends on the species. Our program is equipped to do response for aquatic and terrestrial plants, and we would work with [the state Department of Environmental Conservation] and Agriculture and Markets for forest pests and DEC for aquatic invasive organisms that aren't plants.

It almost sounds like putting a protective ring around the Park. How visible would that be? Would it be like going through an agricultural check at an airport if you were on the Northway for instance?

No. There have been all kinds of suggestions, but what we have been working with partners on is having stewards at boat launches to interact with the boating public about



Japanese knotweed

invasive species and helping to check their boats upon entering and leaving. That could also be done at campgrounds that have lake access. There could also be interactions with campers at campgrounds about firewood, ensuring they aren't bringing anything in that hasn't been treated. Just doing a full-out education campaign with landowners and visitors about practicing spread prevention for invasives is an important step to take.

Even as you're talking about ramping up the effort you're really talking more about education and prevention than you are about the law enforcement approach to things?

Right. At the federal level what I'm hearing is yes, we do need more inspectors looking at what's coming in at the borders and the ports, and ballast water regulations so you reduce the risk of introducing organisms to the Great Lakes. If we can have better inspections at the federal and state levels then that dramatically reduces the number of species that we would possibly be getting in the Adirondacks. So we can have fewer numbers of invading species that we need to manage and then work on prevention more at an educational level.

The big global question that I guess is part of this discussion is climate change. Is that encouraging invasive species?

Yes. Some of the species that have been limited by our cold weather in winter we expect will be able to survive in the future when winters aren't as cold. For instance, hemlock woolly adelgid is an aphid-like pest of hemlock trees. It was detected in central and western New York, and it's moving up the Hudson. It hasn't made its way here yet because our winters are too cold. When you see the projections of the distribution of this pest in a warming climate you see that almost all of the Adirondacks is at risk.

And that would be true of other pests as well?

Absolutely.

Do you get to feeling sometimes that it's overwhelming, that it's really too much all at once to be able to head off?

I feel lucky to be working in the Adirondack Park because it is a landscape where I think we have an opportunity unlike any other at this scale. We have a lot of partners in communities that recognize the seriousness of the threat. And they've been working for many years now to try to arm this region against future devastation. ■

have taken hold. Mostly they've been in urban and suburban areas, so we haven't been able to really estimate what they would do if they were introduced into the Adirondacks.

It sounds like in some cases the cure is pretty harsh, for instance cutting down thousands of trees around an infestation.

Right. The best cure is prevention. For forest pests, these two in particular, cutting trees depends on how many trees or acres are infested. That really will determine what the next steps are.

Isn't it possible to plan your response in advance?

The state is doing mock scenarios so that they at least know who the players are, what resources would be needed, and what the obstacles might be. They are trying to align themselves for quick action. But in terms of what actually happens, you never know. Some species are harder than others. For plants, we know exactly what we need to be doing, and we have a lot of the pieces in place for early detection and rapid response. With forest pests it's more difficult.

We had a story recently about the galerucella beetle that's used to combat purple loosestrife. People seemed excited about it. It raised a question to me about unintended consequences. Are biological controls better understood now than when they introduced the mongoose to Hawaii [in an attempt to control rats that backfired disastrously]?

Yes. Absolutely they are better understood. I think scientists and resource managers learned from some of the less-than-ideal scenarios that were played out. There's a

Japanese knotwood

try to arm this region against future devastation. ■



Volunteers prepare to raise an emerald ash borer trap.

Courtesy of Adirondack Park Invasive Plant Program