Invasive Species River Steward
Tri-Rivers Region, Champlain Basin, New York

NEI Job Code: 989-003-001 Project Code: LS-2010-010
Project Manager: Carol Treadwell-Steitz
River Steward: Kevin Chlad

Final Report

By

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October, 2010

This is the final report for work done by the Ausable River Association (AsRA) to fulfill the responsibilities of the grant " Aquatic Invasive Species River Steward for Tri-Rivers Region of NY," NEI Job Code: 989-003-001 and Project Code: LS-2010-010. The report outlines all work performed between April 22nd, 2010 and September 5th, 2010.

Introduction

Aquatic invasive species that affect rivers are fast encroaching on the Champlain Basin. Didymo, for example, was first detected in a Vermont river in the summer of 2007 and by mid-summer 2008 it was discovered in a river within the Champlain Basin. In Vermont the Battenkill, Connecticut, White, Mad and Lamoille Rivers have know infestations of Didymo. In New York State, Didymo has been found in the Battenkill, Delaware, Esopus Rivers, and most recently Kayderosserras Creek; all within a day's drive of the Champlain Basin.

Didymosphenia geminata, Didymo, or "*Rock Snot*," is an invasive algae; biege to white in color with a wooly texture. Originally known to prefer colder, nutrient poor rivers, it seems to be gaining tolerance for various environmental factors and has become invasive. While not harmful to human health, Didymo can form unsightly mats in rivers which may become barriers to native organisms (caddis, mayflies and stoneflies). As a result, fish populations decline, and fishing becomes difficult. Didymo can travel as a single cell and survive in a drop of water for 40 days. Once established there is no eradication method for Didymo.

While Didymo has received the most media attention there are other invasive species lurking in waters not far from the Champlain Basin. **New Zealand Mud Snail**, for example, infests tributaries to Lake Ontario in New York State. This snail is a tiny (1/8 inch or 2-3 mm) with brown or black cone shaped shells. They reproduce rapidly, reaching populations of half a million per square meter! There is a strong concern that New Zealand Mud Snail will have an impact on aquatic food chains as well as negatively affecting the physical environment (sharp edges could keep fish away). The snails can withstand desiccation and are small enough to hitch a ride on an angler's gear unnoticed.

Rusty Crayfish also warrants a warning as it displaces native crayfish without replacing natives 'place in the food chain. This could have a devastating effect on angling by decreasing the health of fish populations and the aquatic ecosystem. The cray fish's robust pointy claws and aggressive nature make them an annoyance to swimmers and anglers.

Spread Prevention:

Anglers are the major vector for transporting river based invasive species. Because they are invisible or small and illusive to the naked eye, Didymo and NZ Mud Snail are difficult to detect and remove from gear. Fishermen can prevent the spread of these invaders by following the "Check, Clean, Dry" protocol outlined in the "Clean Gear, Clear Water" rack card produced as part of this project (see Appendix A). An angler has a number of choices for eliminating invasive organisms from gear when moving between waterbodies. Drying for 48 hours will kill Didymo. Gear can be soaked in a bleach, soap, or salt solution for one minute. Hot water above 140 degrees can also be used as a soaking solution. Felt soled waders require longer soaking and drying times although they can be frozen solid to eliminate Didymo.

Gear choice has a tremendous influence on spread prevention. Felt is difficult to dry or clean. For this reason alternatives to felt soled waders are being promoted by gear companies and state regulators. Felt waders will be outlawed in the State of Vermont starting in 2011. Most gear companies have developed a "clean stream" boot that has rubber tread instead of felt, and is constructed with minimal stitching, cloth, laces, or other absorbent fibers.

While the fishing industry has worked diligently to improve their products it is still up to the angler to understand the threat, buy the gear, and implement the cleaning instructions. The Ausable River, known worldwide for its trout fishery and spectacular scenery, cannot afford to be impacted by unsightly or ecosystem changing invasives. The West Branch of the Ausable attracts $3.8 million dollars[1] in fishing tourism annually and supports four fly shops and numerous private guides[2]. For this reason the Ausable River Association employed a "River Steward" to educate anglers in the Ausable and encircling watersheds in order to spread the "Check-Clean-Dry" message.

Methods

The River Steward was employed from May 17 to September 5, 2010. The steward's responsibilities included:

1. Riverside education of anglers and other river users within the Tri-Rivers Area.
2. Present workshops to area Visitors Bureaus in order to prepare their staff to become educated informers. Provide bureaus with "Check-Clean-

[1] NYS DEC Staff, 2003, New York Statewide Angler Survey, Estimated Angler Effort and Expenditures: New York State Dept. of Environmental Conservation, Bureau of Fisheries, 625 Broadway, Albany, NY.

[2] Ausable River Association, 2009, Economic Impact Survey mailing to fly and outdoor gear shops in the Ausable watershed.

Dry" tip strips to be sent to visitors making inquiries about river related recreation.

3. Support efforts of fly fishing shops in the Tri Rivers Region to develop cleaning stations and provide them with "Check-Clean-Dry" tip strips.
4. Attend Events, festivals, and farmer's markets to educate the passing public.
5. Maintain streamside boxes and keep them filled with Clean Gear tip strips.

The steward position was held by Kevin Chlad, a 2008 graduate of SUNY Potsdam with a major in Adirondack Environmental Studies and a minor in Wilderness Education. He was previously the "Clarence Petty" Intern at the Adirondack Council and a Steward on Poke-O-Moonshine Mountain. Kevin began May 18 with training at the AsRA office and at the Lake Champlain Basin Program and Paul Smith's College as part of boat launch steward training. Kevin also participated with other Lake Champlain Basin Program Steward activities.

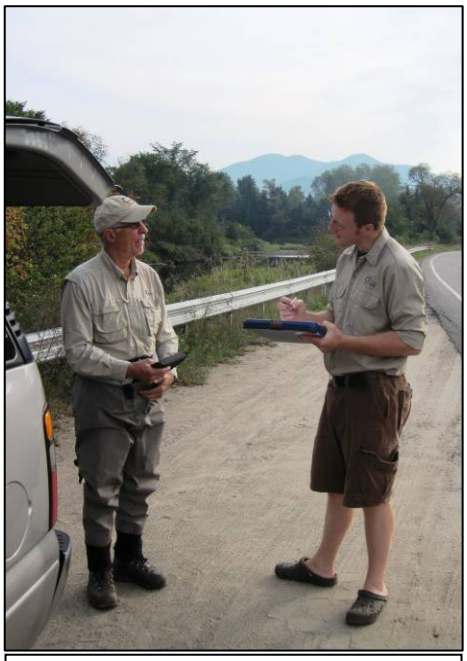

Figure 1.: Kevin speaks to a fly fishermen at the riverside and records survey information.

The River Steward was present on the river for three days a week between May 28th to September 5th. The steward met anglers (and other water recreationalists) and took a survey of their use patterns and cleaning efforts (**Figure 1**). The survey collected information on angler awareness of river invasive species, cleaning effort, spread prevention steps taken, and gear type used (see Appendix B). As part of the survey each user was asked if he/she had cleaned their gear. Responses were recorded on the survey form (Y/N) followed by an explanation of the cleaning options as outlined on the "Clean Gear" Rack Card. Lastly, each user was offered a rack card to take with them. Results of this survey are discussed below.

Two days out of the week the steward worked on outreach to visitor bureaus, fly shops, and events. The steward developed a presentation and guide packet and distributed "Clean Gear" tip strips to these venues. The steward also worked to refurbished and maintain stream side invasive species information boxes.

Central to the outreach effort was the "Clean Gear-Clear Water" tip strip. This brochure was developed in coordination with the Adirondack Park Invasive Plant Program (APIPP), the Lake George Association (LGA) and NYS DEC Invasive Species Coordinator.

It was designed to be a sister card to "Clean Boats-Clean Water" tip strip produced by the same partners. The card presents cleaning options for fishing gear and information on species of concern to rivers, i.e. Didymo, New Zealand Mud Snail, Rusty Crayfish, and pathogens.

The River Steward distributed Clean Gear tip strips on the riverside while conducting the river user survey. The steward also distributed rack cards at outreach events, to fly shops, visitor bureaus, other NGO's and state agencies. The cards are also available from invasive species information boxes at seven spots along the Ausable River (**Figure 2**).

Figure 2.: River Steward, Kevin Chlad, stands next to the "invasive species information distribution" box.

A total of 40,000 cards were printed and distributed as follows:

10,000 cards – NYS Trout Unlimited chapters
7,500 cards – NYS DEC, Invasive Species State Coordinator
7,432 cards – ASRA River Steward
2,500 cards – APIPP
2,500 cards – Lake Champlain Ferries
2,000 cards - LCBP
2,000 cards – NYS DEC, Div. of Fisheries, Region 5
1,000 cards – NYS Sea Grant
1,000 cards – Ausable Club
1,000 cards – Clinton County Clerk – fishing license sales
250 cards – LCBP CAC
100 cards – Town of Keene
100 cards – Town of Jay
Total: 37,382
Retained by AsRA for future distribution: 2,500

Below is a complete list of the River Steward's public outreach efforts:

- River users educated: 315
- Hours spent on the river: 187
- Rack cards delivered: 7,432
- Events and Outreach conducted: 13
    - Adirondack Invasive Species Forum, Paul Smiths, NY
    - Adirondack Habitat Awareness Day, Wilmington, NY

Figure 3. River Steward, Kevin Chlad, hosts a "cleaning station" at the Wilmington Two Fly Contest, May 19, 2010

- Adirondack Farmers Market, Keene Valley, NY
- Ausable Club Field, report to the Forest, Stream committee meeting
- Ausable Two-Fly Fishing Contest, Wilmington, NY (**Figure 3**)
- Boquet River Association Board Meeting, Waddams, NY
- Essex County Fair, Westport, NY
- Festival of Colors, Wilmington, NY (ASRA ED)
- Great Adirondack Trail Run, Keene Valley, NY
- High Peaks Welcome Center on I-87, installed a display for "Clean Gear - Clear Water (**Figure 4**).
- Jay Days, Jay NY
- New York State Council of Trout Unlimited (Annual Meeting)
- Orvis event days, Manchester, VT (ASRA ED)

- Hours of public interface (events, interaction with fly shop merchants and VB staff): 57
- Guides trained: 5
  - Ausable Two-fly shop, Wilmington, NY
  - Hungry Trout, Wilmington, NY
  - Wiley's Flies, Rainbow Lake, NY
  - Jones Outfitters, Lake Placid NY
- Guide Shops visited but not trained:
  - Fran Betters Sports Shop
  - Blue Line Outfitters
- Visitors Bureaus visited: (5) Staff trained: 4
  - Lake Champlain Visitors Center at Crown Point, NY (training not completed)
  - Lake Placid Visitors Bureau
  - Saranac Lake Visitors Center
  - Ticonderoga Chamber of Commerce
  - Whiteface regional Visitors Bureau

Figure 4. The "Clean Gear – Clear Water" display installed in a display case at the "High Peaks Welcome Center" on NY Interstate 87 northbound.

The River Steward's main objective was to reach fishermen of all types and to reinforce the "Check, Clean, Dry" message to the fishing community. Riverside outreach was the largest portion of the steward's duties. The Steward identified outreach points at busy access points along the Ausable River (Table 1). **Figure 5** (below) shows the location of these points.

Table 1. *Fishing Access Points Patrolled by River Steward (listed in order from upstream to downstream):*

1) Iron Bridge
2) Coty Flats
3) Holocomb Brook
4) Rt. 86 Flats
5) Quarry Hole
6) Monument Falls
7) Island Run
8) Shadow Rock Pool
9) Basset Flats
10) Bergmand Run
11) Pump House Pool @ Whiteface
12) Whiteface 1
13) Whiteface 2
14) Flume Pool
15) Lake Everest
16) Lake Everest Dam
17) Au Sable Forks – Gazebo
18) Au Sable Forks Black Brook Town Park
19) Alice Falls Hydro-Electric plant
20) Carpenters Flats (Route 9 Bridge)
21) Ausable Point Campground

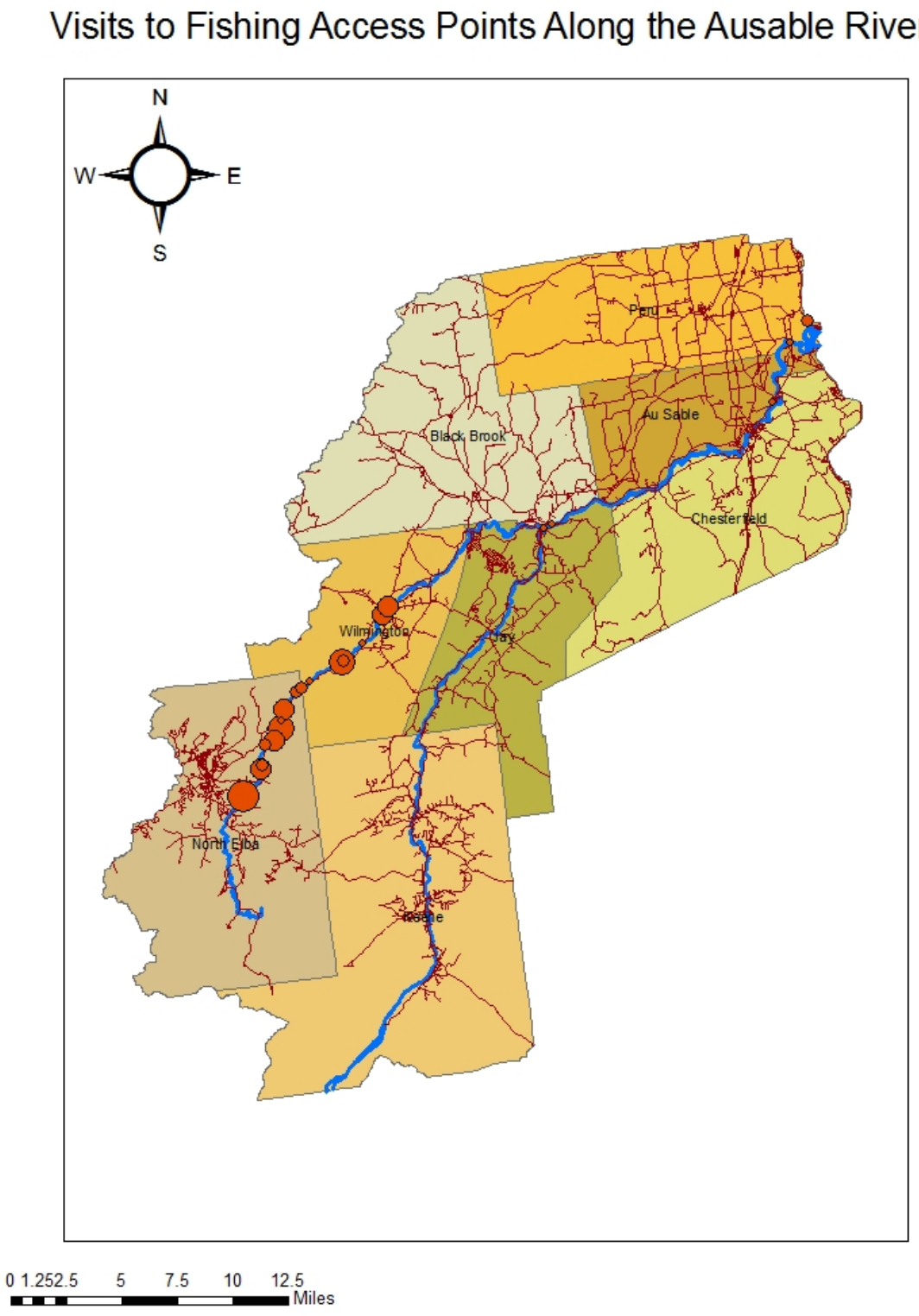

Figure 5. Location of the fishing access points frequented by the River Steward. The diameter of each circle represents the number of fishermen educated at the access point between May 28 and September 5, 2010.

Results

The survey conducted while interacting with fishermen at these access points yielded four key pieces of information: awareness of invasive species, cleaning effort, prevention steps taken, and preferred gear.

Angler Awareness:

When surveyed, roughly 72% of all users said that they had heard of *Didymosphenia geminata* (a.k.a. "Rock Snot"). When asked if they knew of other aquatic invasive species only 16% could name anything other than Didymo (10% of other responses were whirling disease) (**Figure 6**).

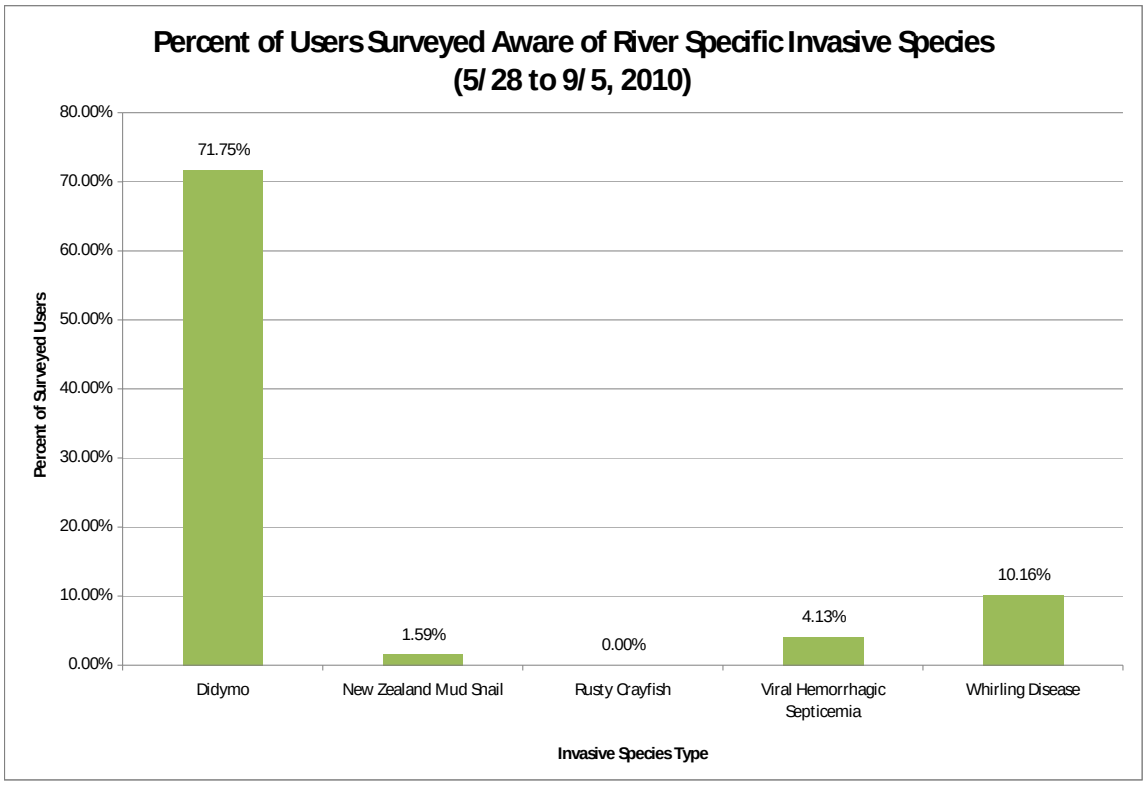

Figure 6. River user's knowledge of invasive species specific to rivers.

Cleaning and Spread Prevention Steps Taken:

Of the 315 anglers surveyed, 37% said they had cleaned their gear. Fly fishermen where the most likely to have cleaned their gear with 50% reporting having cleaned previous to coming to the Ausable (**Figure 7**). Of these, 21% fished only the Ausable with the gear they were wearing. Since the Ausable is an uninfected stream, using gear unique to the Ausable is an acceptable spread prevention method. A quarter of the fly fishermen interviewed had taken no spread prevention steps (27%).

Spin and bait fishermen were the least likely to have practiced spread prevention. In both categories 90% of all users had not cleaned any gear. Furthermore, those that had practiced spread prevention only counted as such because they had fished the only the Ausable.

When inquiring about cleaning, the Steward asked first if users had cleaned their gear and how. Only after recording this response did the Steward educate anglers about other possible spread prevention steps. Many anglers reported drying their gear but few specified that they had dried completely for 48 hours as required to reach 100% cell mortality.

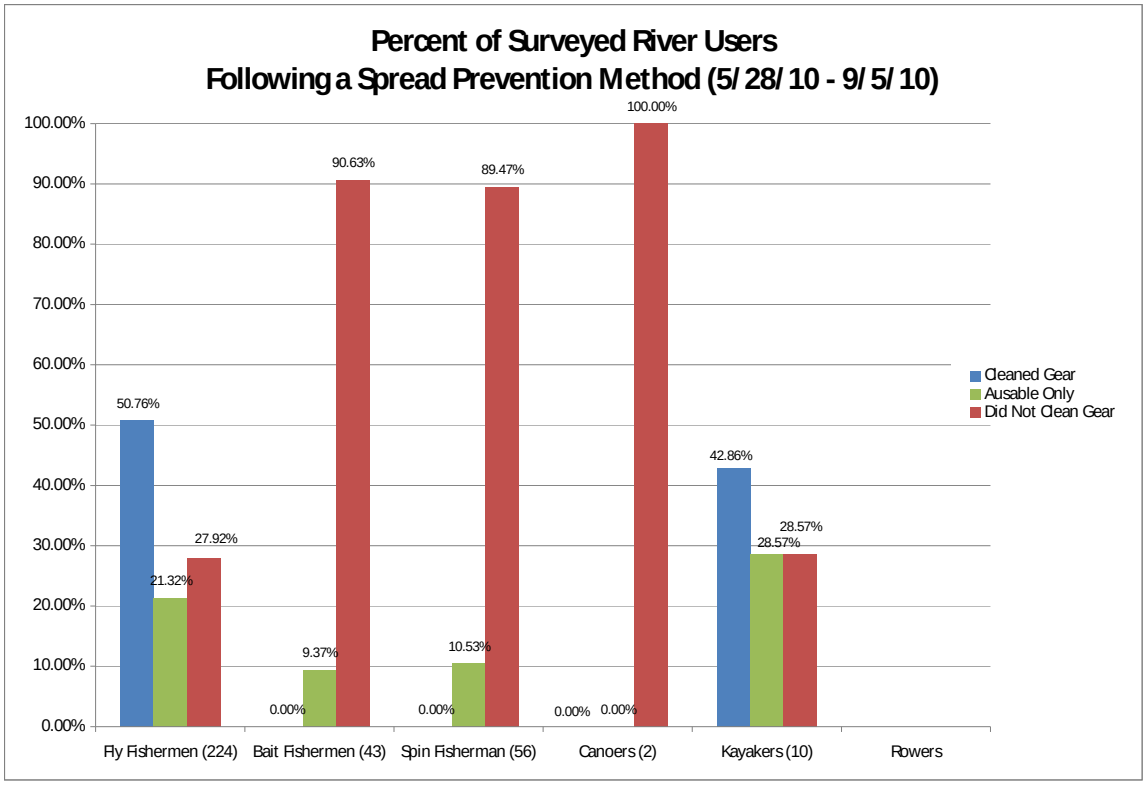

Figure 7. Percent of each user type reporting that they had cleaned their gear.

Spread Prevention Method:

Of the anglers that had cleaned, several methods had been used **(Figure 8)**. Drying was the preferred method; 40% of fishermen had dried their gear previous to coming to the Ausable (this increases to 55% if Ausable Only (AO) is not counted). Using a chemical such as bleach, soap, or salt was slightly less popular with a chemical being

used 30% of the time as a cleaning method (40% less AO). Bleach was the most commonly used chemical cleaning method **(Figure 8)**.

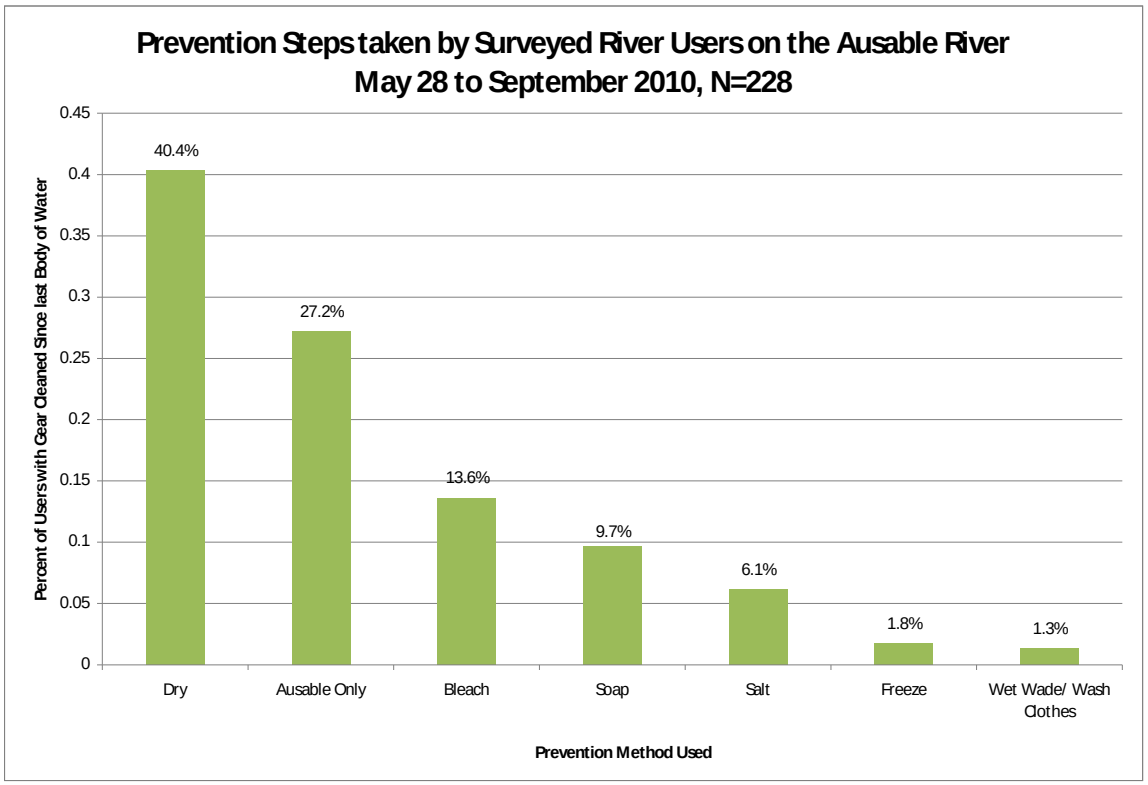

Figure 8. Cleaning methods used by users of the Ausable River.

Gear Choice:

The type of gear that anglers choose to use has a tremendous influence on the spread of invasive species. Felt soled waders are suspected of playing a large roll in the spread of aquatic invasives. Unfortunately, the survey reveals that felt soled boots are the favored foot gear of anglers. A whopping 80% of fly fishermen used felts as their foot gear when entering the river during the angler survey period **(Figure 9)**. Only 17% of anglers used a "clean gear" or alternative type of boot. Spin and bait fishermen frequently wet waded or stood on shore and did not get counted as a gear type (Not applicable).

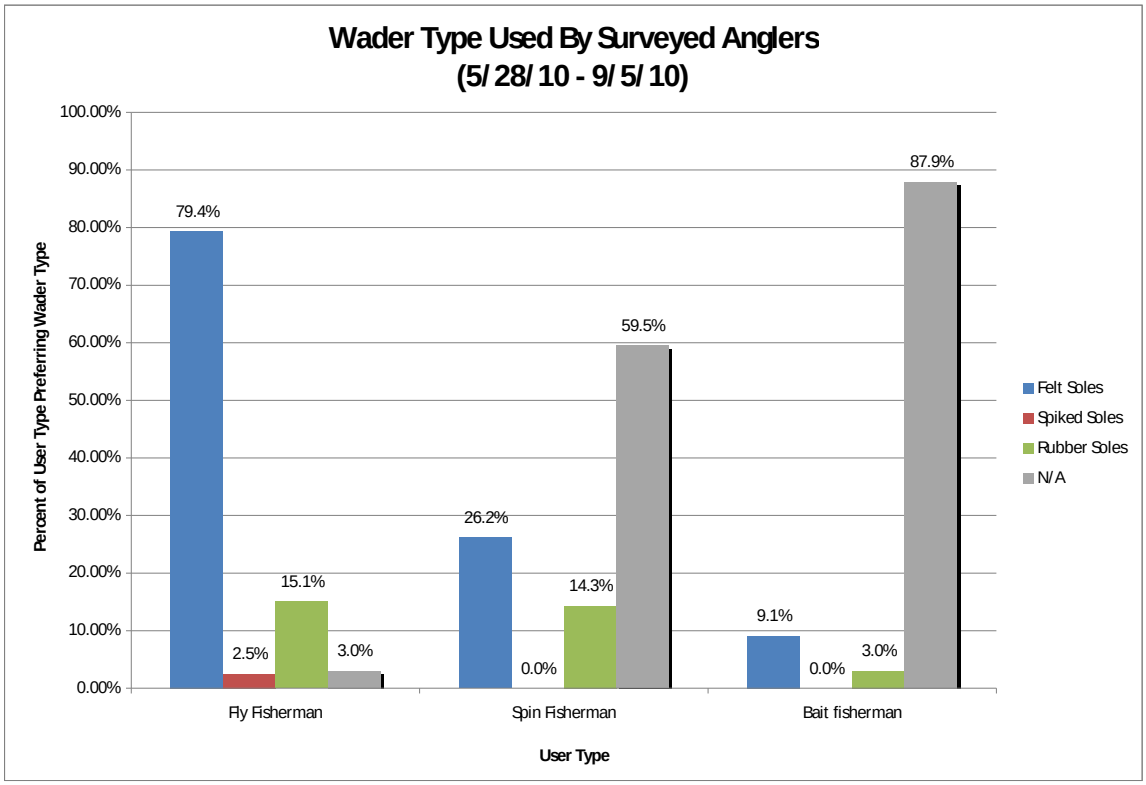

Figure 9. Wader type in use at time of survey 2010.

Other Waters Fished Prior to Visiting the Ausable

Changing anglers' habits and attitudes toward cleaning is key to spread prevention. Moreover, intercepting anglers who are moving from an infected waterway is paramount to minimizing the risk of spread. As part of the use survey the River Steward asked anglers what water bodies they had fished in the past month. The time period of a month was chosen as an inquiry point because a single cell of Didymo can survive for 40 days in a droplet of water.

A number of rivers mostly in the New York, Hew Hampshire, Vermont, New Jersey, Pennsylvania and Quebec had been fished prior to coming to the Ausable River (Fifty-six (56) in total) (Table2). Of the prior visits, nine had been to a stream infested with Didymo (Table 2).

Table 2. Angler visits to other rivers in the month prior to being surveyed on the banks of the Ausable River. *Indicates a river infested with Didymo.

Other Water Bodies, State	Count	Infected*
Atisco Lake Syracuse, NY	1	
Bald Eagle River	1	
Battenkill, VT	2	*
Black Lake, Ogdensburg, NY	1	
Black River, Watertown, NY	3	
Boreas, Minerva, NY	1	
Carmans River, Long Island, NY	1	
Cavendish, VT	1	

Cayuga Inlet, Schuyler County, NY	1	
Cedar River, Indian Lake, NY	1	
Cedar Run, PA	1	
Chazy River, NY	1	
Connecticut River, NH, VT, MA, CT	1	*
Daggett Lake, Weaverville, NY	1	
Delaware River, NY, PA, MD	5	*
Farmington River, CT	1	
Grass River, NY	1	
Grout Brook, Cortland County, NY	1	
Hudson River, NY	1	
Husatonic, CT	1	
Indian River, NY	3	
Johns Brook, NY	1	
Kayaderosseras, NY	1	*
Kinderhook, NY	1	
Lake Placid, North Elba, NY	3	
Latort River, Carlisle, PA	1	
Lehigh, Poconos, PA	1	
Limestone River, Syracuse, NY	1	
Manasquan, NJ	1	
Moose Pond, Wilmington, NY	1	
Negro River, Brazil	1	
Neversink, NY	1	
Ontario, NY	2	
Oswegatchie river, NY	1	
Otter River, Ludlow, VT	1	
Owatka, Rochester, NY	2	
Peaquest, NJ	1	
Pine Creek, PA	1	
Ramapo, NJ	2	
Redeau river, Ottawa	1	
Read Lake, Greenwich, NY	1	
Salmon River, Malone, NY	4	
Saranac River, NY	10	
Schroon River	1	
Spring Creek, PA	1	
Spring Creek, Rochester, NY	1	
St Lawrence River	1	
St. Regis River, St. Regis, NY	2	
The Atlantic Ocean, North America	1	
Two Brook, NY	1	
Wanaquoi, NJ	1	
West Canada Creek, Hamilton County, NY	3	
Westfield River, Chesterfield, MA	1	
White River, IN	1	
Wiscoy, Alleghany, NY	3	
Withewey, QC	1	

Summary

Overall the River Steward program was tremendously successful; 315 fishermen were surveyed and educated streamside, 9 anglers coming from infected streams were intercepted, 13 public events were attended, 5 fly shops and 4 visitor bureaus participated in the educational program, and 37,500 "Clean Gear" tip strips were distributed across New York State and Vermont.

In addition, the summer yielded many valuable lessons: Fly fishermen are generally aware of the Didymo threat but other cursory threats are unknown. The favored boot sole of fly fishermen is felt. Anglers prefer to use drying as a cleaning method. However, anecdotal evidence (conversation with steward) indicates that fishermen dry gear out of habit rather than as a spread prevention method.

Spin and bait fishermen seem to be less well educated about invasive threats and are not likely to clean their gear. This user group was encountered at lakes (Lake Everest on the West Branch Ausable, and Lake Champlain).

These observations support the need for a continued streamside stewarding and education of fly fishermen to reinforce the cleaning message. In addition, spin and bait fishermen need to become a larger portion of the targeted outreach group. Lastly, fly fishing "high season" was discovered to be late April, May, September and early October. These months need to be incorporated into the stewarding calendar.

(Appendix A)

When you move from one waterway to another CHECK, CLEAN, DRY to avoid transporting unwanted aquatic hitchhikers!

CHECK for and remove all mud, plants, and animals from gear, clothing, and pets.

CLEAN everything that came in contact with water. Soak for ***at least*** one minute in:

HOT water: heated above 140° F; OR
Bleach: 1/3 cup to 1 gallon water; OR
Detergent or Salt : 3/4 cup to 1 gallon water.

Household cleaners containing Quaternary Ammonium (e.g. 409® or Fantastic®) sprayed on items, wiped and rinsed off.

Freezing items solid will kill Didymo.

Absorbent items (Felt-soled waders, life jackets) require soaking times of 40 minutes.

DRY gear completely then leave for 48 hours if cleaning is not practical.

STOP AQUATIC HITCHHIKERS!™

Prevent the transport of nuisance species.
Clean all recreational equipment.
Particularly waders boots.
www.ProtectYourWaters.net

Aquatic invasive species (AIS) are non-native plants, animals, and microscopic organisms that threaten native plants, wildlife, and their habitat. They degrade fishing and boating areas and detract from the natural scenic beauty. Once established, AIS are impossible to remove from a river system!

River Invaders to Look Out for:

Vermont Department of Environmental Conservation

Didymo (*AKA Rock Snot*)

- A light brown to beige algae with a rough cottony feel
- Forms mats on river bottoms that become barriers to native invertebrates
- A single Didymo cell can survive for months in a single drop of water!

U.S. Geological Survey

New Zealand Mud Snail

- Tiny snails (1/8 inch or 2-3 mm) with brown or black cone shaped shells;
- Reproduces rapidly and depletes trout food supply
- Populations can reach half a million per square meter!

J. Gunderson & D. Jude, Bugwood.org

Live Bait

- Non-native crayfish and minnows
- Can carry pathogens like Viral hemorrhagic septicemia (VHS) that kill fish
- Displace native crayfish; reduces fish survival

For more information go to protectyourwaters.net or www.dec.ny.gov/animals/50267.html

New York State Council TROUT UNLIMITED

Ausable River Association

Lake Champlain Basin Program

Adirondack Park Invasive Plant Program APIPP

(Appendix B)

Aquatic Invasive Species River Survey

May to September, 2010

River Fishing Access Survey Form 2010 River:_____ Steward Name:_____ Date

Total # of Groups:_____ Weather AM:_____ PM:_____ (sunny, partly s rain)

	Time	Access Point	Group size	Equipment type	Boot Type	Waterbody Name, State	Cleaned? (Y/N)	Prevention Method	Hear of Didymo?	Other River AIS?	Br
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											

Time - military time **Access Point** = Name of fishing access as listed on the Ausable Brochure

Equipment Type: *FF=Fly Fishing; Ba=Bait;SP=spinner; C= canoe; K = kayak; R = rowboat **Boot Type:** Felt=Felt Boots; Sp=Spikes; R=Rubber "clean river"; N/A=not appl

Prior Waterbody (Y/N): Other waters fished in the last month **Water Body Name:** Name of other river(s) fished in the last month and the state they are located in

Cleaned? (Y/N): **Cleaning Method:** S=Soap; B=Bleach; Sa=Salt; H=HOT water (140F); D=Dry for 48 hrs.; Fr = Freeze; SW=separate waders; WW=wet wade. **Hear of Didymo?** Have you heard of Didymo, AKA "R

Hear of River AIS? Have you heard of any other river invasive species? NZ=NZ Mud Snail, RCF=Rusty Cray Fish, VHS, WD = Whirling Disease