



**ISAN**  
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## **Gear cleaning, does it really make a difference?**

by Leah C. Elwell

That is a question that many people ask when they learn that they are being asked to carefully clean their gear after each use. After all, many people reason, ‘I really don’t do anything that makes me especially different and, I am in a hurry to get home after fishing and after all, I really don’t see why cleaning is so important’. The truth is that any one of us could be the one to transport a devastating new species to our favorite water. Proof that we need to clean is well documented and cleaning is something we all should do every time.

It has long been suspected that anglers are able to transport invasive species with dirty equipment. By their very nature, many aquatic invasive species have qualities that allow them to survive adverse conditions. Also they tend to be small and can come in contact with different types of river users (anglers, boaters etc). For example, the larval form of zebra mussels is transparent, microscopic, and can survive out of water for 7 days. These kinds of traits in a species (which are common among many other invasives) are reason for concern. These traits make it likely for us to be transporting mud that contains invasive species on our fishing gear.

In this article, we summarize a few scientific studies that looked at dirty gear and its ability to transport aquatic invasive species. The first study took a detailed look at anglers and their ability to move soil between angling access sites and across the country (Myxospore detection in soil and angler movement in southwest Montana: Implications for Whirling Disease Transport by K. Gates). As well as collecting mud stuck to wading gear, the study also surveyed anglers about their invasive species knowledge and their cleaning practices. There are a number of interesting facts that emerged from her analysis. Some of the most relevant details are highlighted here.

Mud on Boots: One hundred and six mud collections were taken from boots of both resident and non-resident anglers. The mean amount of mud per boot was 8.39 grams. Let’s translate this into a number that mean something to us. If we convert this amount of mud to pounds and then determine the number of anglers it would take to generate a significant amount of mud. It would only take 27 anglers to move one pound of mud on their boots. To put this into the context of a possible real-life scenario, let’s consider an average season for a fishing guide. The average fishing guide in Montana might have around 100 guide days with 2 clients per day. That is a

**Fact: One pound of mud is brought to the stream on boots with every 27 anglers who fish.**

total of 200 clients with boots coming from outside the region or the state. If we use our 1 pound of mud for every 27 anglers, then those 200 clients are bringing in over 7 pounds of mud from their home river. If we

consider that this 7 pounds of mud came from only one guide’s clients for the season, then we

are really talking about hundreds of pounds of mud being moved around by the huge number of clients in a fishing season. These hundreds of pounds are likely moving invasive species from spot to spot.

A couple of interesting points from the study related to mud on boots to consider. When the resident and non-resident boot mud quantities were compared there was no difference between the two. Also, mud was collected both from angler boots that were arriving and departing from a fishing access site were compared and found there was no difference in the amount of mud collected from boots that were arriving or leaving a site. This tells us that regardless of where you live, anglers tend to have similar habits and all anglers have dirty boots.

**Fact: Anglers show up at the river with mud on their gear.**

**Angler Movement:** When anglers were asked about their fishing activities seventy-four percent of Montana residents and 72% of non-residents planned to fish again in the next 7 days. Three percent of Montana residents and 14% of non-residents planned to fish out of state in the next 7 days. These survey numbers tell us that anglers are highly mobile and are people that tend to visit new waters fairly regularly.

**Cleaning Practices of Anglers:** When anglers were asked in the survey about their cleaning practices, it was clear that cleaning was not an overwhelming priority. Fifty one percent of Montana residents and 49% of non-residents said they occasionally, rarely or never clean their

**Fact: About half of anglers typically never clean their gear.**

boots and waders in between uses. Twenty-five percent of Montana residents and 21% non-residents reported they only occasionally, rarely or never completely dried their boots and waders between uses. With less than

half of the anglers out there doing any cleaning or drying of their boots means that a lot of anglers are moving mud and potential aquatic invasive species around.

Overall this study gives us clear reason to clean our gear. Anglers are proven to be moving significant amounts of mud on their waders and nothing good can come from moving mud between waters. When we add the fact that anglers are highly mobile and lack a commitment to cleaning, we have substantial motivation to get more anglers cleaning their gear.

In an interesting related study, Oregon State University researchers donned felt soled wading boots and then stomped in mud that was known to contain invasive species, *Myxobolus cerebralis* the parasite that caused whirling disease. With boots covered in mud and the parasite, researchers then waded through tanks that had healthy trout. Months later the trout were found to be infected with whirling disease. This study shows a direct link between dirty gear and its ability to move viable invasive species (report to the Whirling Disease Initiative).

Both of these studies make plain that boots can move sediment and potential invasive species. We can address this problem by taking clear action and commit to cleaning our gear. It is hard to

deny the idea that dirt and invasive species are sticking to our boots, particularly following these studies. For that reason, it's time for us all to take the simple actions needed to clean our gear.

Removing dirt from our gear is a logical step to take in our angling day. The commitment is as simple as are the methods to clean gear. The basic principles of the Clean Angling philosophy are *Inspect, Clean & Dry*. These steps really help to minimize the spread of invasive species and also allow us to be active participants in preventing spread. Everyone who fishes needs to be a Clean Angler, one who makes *Inspect, Clean & Dry* an automatic part of every trip. Many fishermen understand how important this is and are taking these simple actions. The three steps of *Inspect, Clean & Dry* are self-descriptive. Just from these three words, people understand what they are to do and the actions they produce are what we need. Below are recommendations for how to properly clean your equipment. Please refer to our *Tips for Careful Cleaning* for full instructions on how to clean.

**Waders** must be cleaned very carefully!

- Separate all individual components such as insoles, socks, booties, ankle guards, and laces. Then wash everything - inside and out with water.
- Make sure you remove all dirt, plants and other visible substances. Be sure the treads, seams and any creases or crevasses are completely clean. Use a small brush if needed.
- If possible, thoroughly dry everything before you reassemble the waders.

**Other Equipment-** Reels, nets, lines, gear bags etc.

- Thoroughly wash them to remove dirt, plants and other visible substances. Completely dry them, ideally in the sun on a hot day.

**Heat and cold** can kill many invasives that might be hitchhiking on your equipment. These treatments can be used to supplement careful inspection and cleaning. However, these methods do not kill all invaders. So realize that they help but are not perfect.

- Heat - Soak in a bucket or tub of the hottest water available. Be aware that many hot water heaters do not produce water hot enough to kill AIS. Available research studies suggest minimum of 140° F is necessary. Remove and dry.
- Cold – Store your gear in a freezer to kill many invasives. After overnight freezing remove, thaw and dry. Freezing might be the only good option if you are on a traveling fishing trip with no time to dry between waters. Some motels have freezer space if you ask nicely. Remember, freezing will kill many but not all of the aquatic invasive species (AIS) we are concerned about.

**Drying** kills most invasives. High temperatures and low humidity are deadly to most AIS. Do everything possible to expose your equipment to hot and dry conditions for as long as possible. It's best to dry gear in the sun. If possible, after cleaning, allow the gear to air-dry for at least 7 days. Longer is better.

**Where to Clean** is just as important as how you clean. It's important to clean in the right location. If possible, clean your gear on-site at the end of your trip. If you wash off any invasives at the water you have been fishing on that day, you will just be leaving them where you got them. Don't let them hitchhike away from the site.

Statement of rationale: This article is a summary of research that looked at the potential for anglers to transport soil and aquatic invasive species on wading boots. Please refer to the full articles if you have any interest in the scientific data collected to make their conclusions. Though some of these studies are not peer-reviewed science they have still been subjected to rigor of scientific panels and advisory committees. Further, their results give us a way to rationally discuss the risks that may be associated with not cleaning gear versus cleaning gear regardless of the specific type of gear we are concerned about (i.e. felt, rubber or other materials).

Baldwin T. J. et al. 1998. Distribution of *Myxobolus cerebralis* in Salmonid Fishes in Montana. Journal of Aquatic Animal Health.

Bergersen E.P. and D. E. Anderson. 1997. The Distribution and Spread on *Myxobolus cerebralis* in the United States. Fisheries.

Gates, K. 2007. Myxospore detection in soil and angler movement in southwest Montana: Implications for Whirling Disease Transport. Montana State University Master's Thesis in Biological Sciences.

Reno, Paul. 2005. The potential of vehicles and fomites to transfer the agent of whirling disease. Final Report to the Whirling Disease Initiative.