

## **Minutes from IN Aquatic Plants in Trade Working Group Meeting April 25, 2007**

### **Scope**

Invasive aquatic plants pose a serious threat to the ecologic and economic health of the state of Indiana and the broader Great Lakes region. In an effort to address this issue and implement certain objectives of the 2003 Indiana Aquatic Nuisance Species Management Plan, the Indiana Department of Natural Resources (IDNR) is considering a combination of prevention strategies including regulation, voluntary best management practices, and outreach activities. In partnership with Illinois-Indiana Sea Grant (IISG), the IDNR held the first meeting of the working group formed to address Indiana's invasive aquatic plants in trade. Through presentations and discussion, the groundwork was laid for engaging Indiana's plant industries in the development and implementation of these strategies to prevent the introduction and spread of harmful invasive aquatic organisms.

### **Meeting Proceedings**

#### **Welcome and Housekeeping**

The workshop began with Charlebois welcoming guests and introducing them to the working group's purpose. She then addressed various house-keeping issues, and had each participant introduce themselves, and concluded by introducing the first presenter of the morning.

#### **Invasive Species and the Trade in Ornamental Plants – Reuben Keller**

Keller introduced himself and his presentation explaining that he had just finished his Ph.D. work in September, working with David Lodge at the University of Notre Dame. He said that his presentation that morning would focus particularly on work he has done to look at the role of trade industries in aquatic invasive species (AIS) prevention and spread. He provided an outline of his presentation which would include a definition of invasive species; his Notre Dame research; the role of trades in moving AIS; preventing future invaders; and a brief summary and recommendations. Keller's definition of invasive species outlined the criteria a species must exhibit to be considered "invasive" as the following: movement from native area to non-native area; introduction; establishment; spread; and finally, invasive. Keller indicated that many species pass through some of the steps but may not make it through all of them. In fact, he said that generally less than 15% of introduced aquatic plants become invasive. Keller said that freshwater AIS are rarely eradicated due to a lack of effective methods that will not impact all other living organisms in an infested lake. He also pointed out, however, that aquatic ecosystems can be discontinuous, meaning it is possible to protect systems that are not invaded by isolating them from invaded water bodies. He said the key to reducing the impacts of invasive species is preventing their arrival.

Keller then spoke about the various pathways through which invasive species may be introduced. He explained that many are transportation related, but the focus of today's workshop is the pathway created by commerce in living organisms (live plants). He emphasized that trade was a large part of the problem of invasive species introduction and spread but not the whole problem. He said there were roughly 27 established non-native aquatic plants in the Midwest with 14 considered invasive and having large negative impacts. Species such as Eurasian water milfoil (*Myriophyllum spicatum*) and Brazilian waterweed (*Egeria densa*) are costing a significant amount of money in impacts and control. Keller discussed the work he has been a part of at the University of Notre Dame regarding the live organism trade's role in invasive plant introduction and spread. The researchers first tried to determine which

species were being sold in the trade industries and determine if they were species of concern. To do this, the research team went out to stores selling aquatic plants to get a clearer picture of what plants are being sold, and also, what kinds of invertebrate organisms are being transported on these plants. The research team found there is a massive diversity of species available, all live, and they purchased ones they thought would be a risk to the Great Lakes (i.e., species that are native to regions with similar climates to the Great Lakes region). Keller displayed a chart that listed the 27 established non-native aquatic plants and showed that 18 of them are available in trade, 10 of which are known invaders. In addition, six species are available that are not established, but have been identified as potential invaders due to their invasiveness in other regions similar to the Great Lakes. The research team also examined how accurately the species were being identified in the stores. They found that those involved in the plant trade are much better at using the binomial scientific name than those involved in animal trades. Keller said that roughly 50% of the species are correctly identified at the appropriate level and that the other 50% were identified by the common name or incorrectly identified. Next the research team looked at the presence of contaminant organisms (i.e., hitchhikers) on plants in trade. The researchers focused on animal organisms and identified species by taxa; they could not identify organisms down to the species level because they did not know the geographic origin of the species. They found that when plants are purchased, it is possible to get up to 60 live macroinvertebrates per gram of plant and that almost all plants arrived with hitchhiking organisms.

Keller provided a summary of the risks associated with the trade industries, including the spreading of known invaders and the introduction of new invaders as 13% of the species sampled were already invasive and 8% were potential invaders. As a result of unreliable identifications, he indicated that regulation would be difficult and said that contaminants were ubiquitous on purchased plants, posing an unknown but possibly large risk of impacts. Keller then identified some potential ways to respond to each from an ecological standpoint. He suggested known invaders could be removed from trade and awareness of them increased through public education; potential invaders could undergo a risk assessment and restrictions could be placed on the high risk species; improvement of identifications; and mechanical or chemical treatment of plants before sale to reduce contaminant organisms.

Keller next spoke about reducing the risk of new invasive species. He indicated that many ecologists have been trying to predict which species might become invasive by looking at patterns in species that have become invasive and those that have not. Keller said that if patterns are found and applied to other species, ecologists can estimate risk with about 80-90% accuracy. He provided the example of Australia, which has mandated risk assessments for all new plant introductions since 1997 and said that following Australia's example and apparent good results, New Zealand now requires the same process and the U.S. Department of Agriculture is considering the adoption of a similar program. Keller then addressed the question of whether a risk assessment program can produce economic benefits. He explained if 100 species are proposed for introduction and we make the assumptions that 10% will become invasive and ecologists can predict invasions with 80% accuracy, then in this example, 8 invasions are prevented and 2 occur. He pointed out a problem, however, which is that 20% of the predictions made for non-invasive species will be wrong, which results in a total of 26 species being prohibited of which a large percentage would have been beneficial. Keller then presented the results of an economic model for assessing risk assessment programs. This model shows that, for the Australian trade in ornamental plants, risk assessment becomes economically beneficial after only 10 years. He predicted that over 50 years the program would lead to economic benefits of \$1.8 billion compared to a policy of no risk assessment. Keller also indicated that the benefits of such a program in the U.S. might be greater because the country has a much bigger industry, and it also has much higher costs associated with the impacts of invasive plants. That is, the U.S. has more agriculture resulting in higher costs of control which would increase the benefits of a risk assessment program. In addition, he said that more aquatic plants become invasive than terrestrial, which also increases the benefits of risk assessment. In summary, Keller reminded participants that trades in live aquatic organisms sell many species known to cause large negative impacts and other

species that may become invasive in the future; there is a high occurrence of incorrect identification; contaminant organisms pose an unknown, but possibly large, risk; and removing high-risk species from trade leads to environmental and economic benefits.

### **Regional Invasive Species Initiatives – Pat Charlebois**

Charlebois' presentation was intended to provide a broad overview of aquatic invasive species (AIS) issues in the region. She first explained that her presentation was a condensed version of one originally prepared by Kathe Glassner-Shwayder of the Great Lakes Commission (GLC), who was unable to attend the meeting. Charlebois explained that state management plans (SMPs) have their roots in federal legislation – the National Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA), and that the legislation provides federal funding for implementation of approved AIS prevention and control plans. Many of the Great Lakes states have approved plans and the Indiana SMP was approved in 2003, with several goals:

- Coordinate efforts among agencies and organizations
- Prevent new AIS introductions
- Conduct monitoring to enhance early detection of new invasions
- Institute rapid response planning
- Limit the spread of established AIS populations
- Mitigate harmful AIS impacts
- Evaluate plan effectiveness using adaptive management strategies to update the plan

After describing various state management planning efforts, Charlebois provided examples of other programs for AIS prevention and control, including plant listing and outreach programs. She introduced outreach programs such as

- Clean boats, Clean waters – a program of watercraft inspections for recreational boaters;
- Do Not Release – a program identifying plants to consumers and retailers in trade industries;
- Hydrilla Hunt – a proactive Michigan program to prevent hydrilla in the state; and
- Habitattitude™ – a program focused on providing a consistent message for different private industries such as the pet and nursery industry

Charlebois discussed plant listing programs and indicated that Indiana is not the only state considering a listing process as several other states already have them in place. Examples she gave were Wisconsin, Illinois and Minnesota. Minnesota was the most complex of the listing programs she presented and involved a 4-tier listing of plants. Based on the success of these listing programs as defined in a report by the Environmental Law Institute (*Making a List*; available online ([http://www.elistore.org/reports\\_detail.asp?ID=10990](http://www.elistore.org/reports_detail.asp?ID=10990))), there are recommended components of a listing program including definitions; the burden of proof; the ability to identify species; systematic science; transparency of the process; flexibility and responsiveness; de-listing; and enforcement. In addition, Charlebois relayed that their advice is that stringent requirements might be reserved for the most problematic species and that there needs to be considerable outreach and education, as well as a voluntary approach to management. In conclusion, Charlebois emphasized that aquatic invasions are a challenging environmental problem demanding multifaceted.

### **An ounce of prevention is better than \$2 million in control: Indiana's Aquatic Invasive Species Strategy – Doug Keller**

Keller began his presentation by explaining that the working group was formed at his instigation, with the help of Illinois-Indiana Sea Grant. He gave an overview of his presentation which would include what

actions are currently be taken in Indiana, Indiana's current problems and a proposal for future actions. He provided a framework for his presentation with a recommendation from Indiana's state management plan:

*Establish a systematic risk identification, assessment and management process to identify and modify pathways by which nonindigenous aquatic nuisance species spread.*

Keller emphasized that this effort would not be limited to specific species, but would be taking into consideration pathways through which major invaders are coming in to the state. He described two primary pathway groups, as follows:

1. *Foreign introductions*: ballast water; aquaculture; organisms in trade
2. *Movement once here*: fish transfer and bait release; recreational activities; canals and waterways

With regards to preventing introductions via these pathways, Keller acknowledged that state influence lacks in two of these areas: ballast water and canals and waterways. He indicated that the state would not be effective in attempting to regulate ballast water and would prefer federal legislation. As a regulatory agency, Keller explained that IDNR has started to address or made plans to address all the pathways the state can have influence over. He gave the following examples of these efforts:

- *Fishery rules* – a mostly reactive, but in some cases proactive (snakehead, walking catfish, black carp), list of species that are illegal to possess live in the state
- *Fish stocking permits* – regulations which make it illegal to stock fish without a permit in the hopes of controlling what species go into Indiana waters
- *Aquaculture species list* – a “clean” list of 33 species which can be brought into the state, any species not on the list requires a permit; and a “black” list of species which are prohibited and for which a permit will not be approved
- *Bait regulations* – limited regulations which need to be improved and that IDNR is working to develop so that it will address the fish transfer and bait industry pathway

Keller also indicated that IDNR is considering regulations that some other states have adopted to slow invasive plant spread via aquatic equipment. He said that the organisms-in-trade pathway has not received a lot of attention from the agency and that it would be the focus of the rest of his presentation.

Keller explained the few regulations in place for plants. He indicated that the regulations have primarily been reactive and very cautious in favor of the plant trade because the agency realizes it is a money-making business. He also said that this caution has caused much of the regulation to be ineffective. The regulations cover only a couple of the current problem species present in the state, including curlyleaf pondweed, purple loosestrife, Eurasian water milfoil, Brazilian elodea, and hydrilla. He qualified this list explaining that Brazilian elodea has been found in one lake and several private ponds, is very aggressive, and is displacing even the Eurasian watermilfoil. He also explained that hydrilla was only recently found in August of 2006, also only in one lake. He provided a description of the regulations, as follows:

- *Purple loosestrife Rule* – any species of *Lythrum* (purple loosestrife) is prohibited and the native *Lythrum* species requires a permit in Indiana.
- *Brazilian elodea Rule* – elodea is illegal to possess, sell, offer for sale, etc., as an outdoor water plant. Elodea can only be used in indoor aquariums and anyone in possession of the plant not in an indoor aquarium must make lawful efforts to eliminate the species. The rule was implemented about a year ago as a temporary rule that IDNR is working to make permanent over the next few months. Keller described this rule as a good example of caution in favor of the industry as this plant has proven very problematic in many areas of the U.S., yet the rule only goes so far as to regulate the plant outdoors.
- *Hydrilla Rule* – a rule similar to the Brazilian elodea rule, with one addition: the state has the ability to quarantine (i.e., shut down) a body of water if hydrilla is found to be present. Hydrilla

is listed as a federal noxious aquatic plant along with 1-2 dozen others and is the only federally noxious aquatic weed regulated by the state. The federal regulation prohibits transfer across state lines, but allows for species movement within a state if they do not have their own regulation. Keller indicated that this is another temporary rule and IDNR is proceeding toward permanent rule status.

Keller next moved into describing the costs associated with aquatic plant invasions in the state of Indiana. He noted the important difference between eradication and control: eradication implies completely eliminated throughout the state whereas control is implemented under conditions when the plant already exists throughout the state and eradication is unlikely, thus leading to strategic removal of the species in areas where feasible. The first example Keller provided was Griffy Lake in which Brazilian elodea is found. The lake is approximately 109 acres, and it costs approximately \$1,240/acre to eradicate. Lake Manitou, the lake in which hydrilla is found will cost an estimated \$2 million over 5-6 years (\$2,290/ per acre per year) to eradicate. Keller explained that the Lake and River Enhancement Program in Indiana has been funding \$0.5million/year for Eurasian watermilfoil control in 70 lakes across the state, but he said, the state could easily spend four times that amount per year (\$2 million/year) and still only be controlling the species. He described that the costs of aquatic plant invasions include not just the price of herbicides but other economic figures such as:

- Reduced recreation spending, which amounts to about \$1.5 billion/year in the state and is money that goes not only to the state but to local economies as well;
- Reduced property values as a result of weedy lakes;
- Equipment damage such as tangled boat motors and clogged irrigation systems;
- Ecological damage; invasive species can create a monoculture in an ecosystem, reducing the number of plants which in turn will reduce the number of animal species and create unattractive ecosystems.

Keller concluded his presentation with a proposal for action to control and prevent the spread of aquatic invasive organisms. His proposal included a “white list” of plants that pose little threat and a “black list” of plants that are known to have extremely negative effects. He emphasized that the “black” list would not be longer than the “white” list and that it should focus on plants that are known to be able to live in Indiana. He also indicated that there would be a grey area consisting of everything that is not on either list and for which careful consideration should be made before bringing that plant into the state. In conclusion, he explained that regulation will be combined with other actions such as implementing BMPs, education directed at consumers and retailers, and establishing alternatives for prohibited plants will also contribute greatly to this effort.

### **Group Work – Kristin TePas**

TePas stepped the working group through a series of questions that essentially laid the groundwork for the group’s operation and process. These questions (in italics) and the group discussion and/or decisions were:

*Why has the group been pulled together? What is the overall purpose?*

Serve in an advisory capacity to resolve Indiana’s problem with invasive aquatic plants via regulations, outreach and voluntary guidelines. Regulatory authority lies with the Division of Entomology and Plant Pathology; however, D. Keller with the Division of Fish and Wildlife will be writing the rules.

*What do we need to have when we are done? What are our deliverables?*

Plant listings/regulations – how to classify plants, and what regulations or rules apply to the plants in each classification. There was discussion as to whether economic or environmental considerations would prevail. It was suggested that the group could consider both via a

cost/benefit analysis. Also, it was pointed out that determining the invasiveness of an individual plant will be based on science, but what the group does with the information can be weighted by economics.

Outreach tools – ideas for product and implementation

Voluntary guidelines – ideas and implementation plan

*How are we going to go about doing our work? What is our process?*

Regulations - decide on number and types of tiers (Mindjet could help with decision)  
- decide on process for assigning plants to each tier (Mindjet might help)  
- need a comprehensive list of plants in trade  
- need a plan to communicate listings to trade  
- Mindjet is a decision making tool available on the Internet

Outreach and Voluntary Practices – detailed process will be discussed at future meetings  
- products and plans  
- implementation

*Who is responsible for doing what?*

The working group will develop the process. The DNR/DPP will implement the regulations. Outreach will be conducted by Sea Grant, industry (stores, associations, web sites), DNR (including enforcement). Recreational water users can help identify infested waters, and can educate others.

*What are our resources and constraints?*

There essentially is no money for operation of the working group. Time given by the working group is greatest resource. No timetable was identified. One constraint is that mid-March through mid-June is the busy season for the industry. Scheduling may be difficult. (One suggestion to deal with lack of funds was that we take turns bringing snacks.)

*Who needs to know about our progress? How will we communicate our activities?*

Within the working group - e-mail is the preferred mode of communication. Participants agree that they are willing to do “homework” in preparation for the subsequent meetings.

External to the working group - individuals will go back to associations and customers to keep them informed and bring their comments back to the group. Also, it would help if individuals got a mandate from their associations that he/she can be a representative of the associations’ opinions. D. Keller is willing to handle any media inquiries. Executive summaries should be posted on-line wherever possible including IISG, IDNR, INLA.

TePas then inquired about operation logistics. It was decided that the group would meet approximately monthly, at Ft. Benjamin Harrison. The group requested a longer format (e.g., 10am – 3/4 pm) to hopefully reduce the total number of meetings. The group decided on consensus as the decision-making mode, and that the meetings would be documented via summaries 1) compiled by Charlebois/TePas/D. Keller, 2) distributed via e-mail for comments, and 3) approved by the group at the following meeting. TePas and D. Keller then asked that each member compile their own list of plants in trade for homework, with details coming via e-mail. It was also decided that R. Keller would present possible risk analyses at the next meeting. Date and time for the next meeting would be arranged by e-mail. TePas thanked everyone for coming and adjourned the meeting at 3:50.