



March 2010

# Report #13

Unique Habitats  
Unique Challenges



## Unique Habitats, Unique Challenges: IPCBC Public Forum and Annual General Meeting

January 19-20, 2010

Canada  
Invasive Alien Species Partnership Program



Fraser Salmon & Watersheds Program



*A special thanks to the Fraser Basin Council for their ongoing and continued support of the Council and its work.*

[www.invasiveplantcouncilbc.ca](http://www.invasiveplantcouncilbc.ca)

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## Acknowledgements

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## Overview

"Unique Habitats, Unique Challenges", the Invasive Plant Council of BC's (IPCBC) 5th anniversary celebration and Annual General Meeting, was held from January 19th to 21st, 2010 in Richmond, British Columbia. Presentation highlights included topics on bioenergy crops as a potential pathway of invasion, monitoring and management of aquatic invasive species, Australia's "Weed Spotter" program for increased surveillance, and collaborations to increase Aboriginal involvement in invasive species management and prevention. This forum set a new attendance record with a total of 169 participants – thank you for your interest and support!

## Forum Speaker Presentations

### A Regional Approach to Aquatic Weed Management in the Pacific Northwest

**Keynote Speaker: Mark Sytsma, Portland State University**

The Columbia Basin provides widespread ecological and economic connections for the Pacific Northwest region. However, freshwater resources are increasingly stressed, affecting many ecosystem services, and biodiversity and many fish species are affected by invasive species.

Aquatic ecosystems are worth an estimated \$3,274/ha/year and aquatic invasive plants are more expensive to manage than terrestrial species. Evaluating the economic impacts of invasive plants shows *Spartina* with the highest impacts at approximately \$1,665/ha. Invasive aquatic plants cost Florida \$1 billion, and Eurasian watermilfoil has impacts of \$84 million in BC.

Survey results showed that Oregonians are willing to pay \$189/year to delay high impacts for 10 years. Extrapolated for BC by numbers of households shows British Columbians would be willing to pay up to \$340 million CDN to prevent invasive plant problems.

Aquatic invasive plants create numerous impacts on aquatic ecosystems, such as shading of native plants, affecting habitat patchiness for fish, reducing recreation values, decreasing light penetration, which subsequently decreases prey opportunities for fish, and blocking heat penetration into the water. It's important to link fish populations and recreation opportunities with Eurasian watermilfoil management, to develop and maintain public support.

Some important vectors for invasive plants are overlooked, such as shipping ballast water discharge, and require more research. Four key aquatic invasive plants in Washington and Oregon have been spotted in British Columbia, proving the

*The purposes of the Invasive Plant Council of British Columbia are to: 1) educate the public and professionals about invasive plants and their risk to ecosystems and economies through activities such as workshops, seminars, and newsletters; 2) fund research relating to invasive plants and make this available to the public; and 3) undertake and support actions that improve the health of BC's natural ecosystems.*



**Keynote speaker, Mark Sytsma, spoke about managing aquatic invasive species in the Pacific Northwest.**

need for regional management programs, such as the West Coast Governors Agreement on Ocean Health, the Pacific Ballast Water Group, and the Pacific Northwest Economic Region. The Columbia River Basin Team of the 100th Meridian Initiative and the Western Regional Panel are additional addressing zebra mussels.

#### Recommendations are:

1. Think like a region and avoid parochialism.
2. Link organizations through a regional organization.
3. Prioritize species and develop effective management strategies.
4. Harmonize weed lists.
5. Continue studying invasive plant vectors of spread.
6. Engage policy makers (e.g., the Pacific Northwest Economic Region approach).



IPCBC Chair, Duncan Barnett, thanked Mark Sytsma for his presentation and lively question/answer session with participants.

## Aquatic Weed Monitoring and Management in Washington

Janifer Parsons, Washington State Department of Ecology



Janifer Parsons

### Questions and Comments

- Q:** I have aquatic ornamental plants in my yard pond and I live 10 km from a river. Are these ornamental invasive plants a threat?
- A:** Yes, they are a threat. Birds can pick up fragments and transport them. Replace with native species.
- Q:** How is ballast water managed?
- A:** It should be replaced mid-ocean, and managed both entering and leaving the ship.
- Q:** When invasive plants are for sale, have you worked to ban their sale?
- A:** Yes, invasive plants are on noxious weed lists for Oregon and Washington, and cannot be sold in most states. That part is easy; developing the weed list to prevent sale is the issue.
- Q:** Why is wildlife restoration an invasive plant vector?
- A:** An example is fish stocking where fish are transported from the hatchery to a lake and they bring in disease.
- Comment:** Regarding the 100th Meridian Zebra Mussel Plan, the Premier of British Columbia has signed onto this plan.
- Comment:** Invasive plants can be purchased on-line, which is the most difficult pathway to control.
- A:** Yes, this is a problem, and it needs more education.
- Comment:** BC has signed the Memorandum of Understanding with Washington State to manage Spartina.

Responsibilities for freshwater aquatic invasive plant management in Washington include the Aquatic Weed Management Fund under the State Department of Ecology, the State Department of Agriculture, counties, local jurisdictions, lake management districts, Corps of Engineers, and private landowners. State-level committees are the Aquatic Nuisance Species Committee, which fosters communication among agencies involved in aquatics, and the Washington Invasive Species Council which provides policy direction. The State Noxious Weed List is divided into five plant classes: eradication, control, no control, quarantine, and monitor.

Permits are necessary for aquatic invasive plant management, and herbicide use in water requires aquatic endorsement on the herbicide applicator license. Aquatic invasive plant management is funded from boat trailer taxes and license fees, which support staff, planning, and research. Grant money is used to fund education projects, research, Integrated Aquatic Vegetation Management Plans for lakes, and control.

Monitoring documents control effectiveness, looking for plant presence, tracking populations over time, and collecting data on anything unusual. Summer field visits inventory 70-80 lakes and those at high risk for invasion. Methods include circumnavigating the lake to map any plant infestations with GPS. Grids are set up for more research-oriented inventories to collect data on plant presence and biomass.



## Questions and Comments

**Q:** What is a quarantine list?

**A:** It lists plants that are illegal to sell or transport in states. It is established and regulated separately from the noxious weed list.

**Comment:** BC would like to have a quarantine list.

**Q:** How does the public respond to putting herbicide in lakes?

**A:** Lake residents' groups have their own personalities. The responses across the state vary from encouragement to treat, to strong opposition, with roughly east/west geographic trends, respectively.

**Q:** Can you discuss the milfoil weevil?

**A:** It is native to North America. Results are variable since the release program began in 2003, one reason being that certain fish like to eat the weevil.

**Q:** Are research results available on the impacts of herbicide to non-target species (plants and fish)?

**A:** Yes, available on our website, or contact Jenifer for more information. Different herbicides had different impacts on native plants – they often rebounded after invasive plants were controlled.

**Q:** What is the process to attain a licenced applicator endorsement?

**A:** It involves taking a fairly difficult test with lots of math calculations. Continuing education courses are required to keep the endorsement current, or the test must be rewritten, and the work itself needs specialized equipment. The endorsement is quite difficult to attain, so herbicides are therefore carefully applied in aquatic systems.



Vasiliki Karpouzi

using MS Access to show the number of aquatic invasive species, current locations, and watersheds currently at risk. It will be available to the public on the MOE website. Data are being extracted from government literature, other databases, E-Flora, and experts. The database currently has 1319 occurrence records that cover 30 species (more than plants) since 1906, and it will allow non-government experts to upload data. Database users can extract information from the database, e.g., location of species and plot on map using GIS, and from IMAP BC for analysis. BC Species and Ecosystems Explorer will allow searching for species occurrences.

### The outlook includes:

- Continue population database.
- Launch online version soon.
- Conduct research to understand introduction vectors.
- Habitat suitability modelling.

## Aquatic Invasive Species in BC: Work to Date and Future Steps

### Vasiliki Karpouzi, Ministry of Environment

The biological impacts of aquatic invasive species include being the second biggest threat to biodiversity, they degrade water quality and produce alternative aquatic habitats, and they introduce disease and pathogens. Additional socio-economic impacts occur to fisheries, navigation, and hydro-electric programs.

The aquatic invasive species public outreach program begins with raising public awareness in Year 1, followed by action, such as lakefront signs stating no dumping or movement of live fish. A school curriculum is being developed, and conservation officers address enforcement.

The Aquatic Invasive Species Database was created

## Questions and Comments

**Q:** Are you looking to correlate the database with the Conservation Data Centre?

**A:** The CDC is getting aquatic information from the aquatic invasive species program.

**Q:** How are boats intercepted and inspected for mussels?

**A:** At the BC/USA border, boats are inspected for mussels, cleaned and allowed to travel on.

**Comment:** These checkpoints shouldn't be only between countries but within countries as well.

**Q:** What are examples of reward and incentive programs?

**A:** Please talk to Matthias Herbourg (MOE).

**Q:** Did you consider linking with the Invasive Alien Plant Program?

**A:** Yes, conversation is happening with the Ministry of Forests and Range.

## The Development of A Rapid Response Framework for Aquatic Invaders: Implications for Aquatic Plants in British Columbia

Thomas Therriault, Fisheries and Oceans Canada



Thomas Therriault

Rapid Response is the ability to quickly respond to a new introduction. Prevention is the first line of defence for invasive plant incursions, but it is not 100 percent effective so we need a rapid response mechanism as the second line. In the past, our reactions have not been rapid and it has taken months or years to do anything. There are many valuable lessons from past failures.

The optimal outcome is to eliminate future risk. This is done by eradication, which is not a simple task. The outcome or goal is only feasible under limited circumstances (e.g., target species is confined, species detected early in invasion cycle). Rapid Response plans need to consider a range of management goals, including deciding to live with the invasive species.

To enable consistency for plans, a Rapid Response Framework should include consideration and input from science, management, and policy, as well as the availability of tools, capability, and resources to undertake a response. Include four elements: discovery, containment, risk assessment, and management options.

Although it is difficult to achieve, eradication should be the first choice. This will prevent the long-term risks of economic, ecological, and socio-economic impacts once a population establishes. Include all the agencies early on for all Rapid Response activities. Remember to publish the failed responses in scientific literature to share that information.

Implications for BC include a Rapid Response Framework's broad applicability to aquatic and terrestrial species, and it can be adopted for several programs. It is unlikely that a single agency will undertake Rapid Response activities. Therefore, have all the players early, and then the chances of success are better. Early detection provides the greatest probability for success and can arise from monitoring programs. Finally, reporting is a critical step.

## Questions and Comments

- Q:** Has DFO quarantined any lakes with invasive species in them?
- A:** Canada has no legislation regarding aquatic invasive species; the closest topic is shipping ballast. The *Fisheries Act* has not been tabled. This is clearly a gap.

## Invasive Aquatic Species Issues in Idaho

Tom Woolf, Idaho Department of Agriculture  
[www.aquatics.org](http://www.aquatics.org)



Tom Woolf

Invasive aquatic species produce many impacts: they degrade habitat, out-compete native species, degrade fisheries, and restrict water flow. As well, they produce economic impacts to irrigation, drinking water, recreation, fisheries, and endangered species. Natural resources are worth protecting but it is hard to be proactive when many waterbodies currently have no invasive species. However, water-based recreation is very economically important and people take potential impacts to heart.

Idaho Laws include the Noxious Weed Law and Rule (2006), the *Invasive Species Act* (2008), and the Invasive Species fund (2009) for surveys, prevention, and education.

Early Detection and Rapid Response (EDRR) is critical and requires having educated people on hand who know what to look for, and vigilance in conducting and addressing any new

infestations. Treatment options for invasive aquatic species include herbicide application, suction dredging, diver hand-removal, and benthic barriers (mats placed on top of the invasive plants).

Monitoring is critical for EDRR. Surveyors look for invasive plants, mussels, snails, and other organisms that seem out of the ordinary. Coordination is with state federal agencies, counties, non-profit groups, and the public. It's important to engage, educate, and empower: give people a sense of ownership and stewardship. Prevention is critical.

Twenty watercraft inspection stations were set up around the state to target the zebra mussel through 18,000 inspections. Inspections provided an educational opportunity where people learned about invasive species and asked to "Clean, drain, and dry your gear." Education also includes signs at boat launches, information in fishing regulations, and newspaper articles.

#### Keys to Success

- Educate the decision-makers—and everyone else, too
- Communicate and cooperate
- Find assistance at all levels
- Learn from others' experiences
- Have persistence
- Go with what you've got. Get something out on the ground!
- Be an advocate, get involved

### Questions and Comments

**Q:** Is there a method for washing cooling systems in boats?  
**A:** Use engine muffs and run 140-degree water through them for one minute.

**Q:** How much has Idaho spent on Eurasian watermilfoil?  
**A:** \$9 million since 2006.

**Q:** What is the #1 way of educating decision makers?  
**A:** If they have a vested interest that is being impacted it's not hard to get them on board. For example, show them a pipe clogged with zebra mussels. "Prevention is key." Educate them and show them the potential impacts.

**Q:** Did you employ the use of lobby groups?  
**A:** No, just concerned citizens who talked with legislators.



"Unique Habitats, Unique Challenges" during plenary sessions.

### Invasive Species: An Insidious Inevitability?

*Doug Konkin, Deputy Minister of Environment*



Doug Konkin

Areas like southern Florida have big problems due to the release of alien plants and animals. What is natural there now?

The big question is "Can we galvanize the public around invasive plant issues?" Invasive plant impacts can be virtually irreversible, or extremely costly to reverse. In BC's Capital Region, all parks have at least one invasive plant species, and at least one-third of parks have a problem developing. The Okanagan in the Southern Interior region of BC is semi-arid and very complex, with wide ecosystem diversity and high development. As a north/south corridor, it provides a natural migration route for invasive species. The region encompasses 30 percent of Species at Risk, and fire exclusion adds another dimension. It's our southern Florida.

Climate change is the big trump card, and especially with subsequent changes in land use and target values, along



with the need for water conservation. Species that cannot move are increasingly under pressure and more susceptible to invasive plants. Furthermore, clean energy production and export will provide more transport vectors for invasive plants. Our ability to bring back natural states is becoming more and more limited. Is it worth taking resources to maintain Species at Risk at the very fringe of their range or should we pour them into invasive plant battles? Maybe that's a better approach.

"Now is the time of the environment" for the Premier and Cabinet. There is high receptivity, and the economy and environment have become synonymous. Use the Conservation Framework in BC: it is a systematic approach around species and ecosystems used in day-to-day decision-making, and available on the MOE website.

Wide collaboration with partners is the best tool. Issues include Spartina, parks, IPCBC and weed committees, and Hot Spots. Market approaches and communication are critical to developing a good business case. It's hard to get people to listen, especially without an underlying understanding of issues. Biological invasion moves slowly, and most invasive plants are attractive. Make it understandable, urgent, and real to the individual.

We need to try. We need high-profile champions, a united approach, science, education, public support, and making changes in how we live, work, and travel. The mountain pine beetle impacts helped solidify the case for action on climate change and related issues. We need to flip issues on their heads and figure out related ways to grow the economy. The quickest to adapt will survive: that applies to invasive plants and also to how we anticipate and react to them.

## Questions and Comments

**Comment:** Investment in Species at Risk

**A:** The Conservation Framework is trying to capture. Ask questions. Government has fewer resources to do what it has done. Synergies are what it's all about. Dealing with SAR and invasive plants can happen concurrently and investments don't have to be mutually exclusive.

**Q:** Will invasive species ever be considered 'biological pollution'?

**A:** We have to get out of reacting, as much as possible. Prevent the problem in the first place. Don't accept the cost of prevention. Toxins are a #1 issue – go right to the source; it's the same for invasive species.

**Q:** Will BC ever have municipal cosmetic pesticide controls? Could it go to provincial?

**A:** We won't go to the Ontario model, as it's too costly. There are smarter things we can do with current practices, and there are many sides to this issue.

**Comment:** With a lack of budgets to manage Crown lands, as a neighbour to private landowners, the Crown's



Duncan Barnett thanked Doug Konkin for his engaging presentation.



Forum festivities included lively 'Nibble and Network' sessions.

## Questions and Comments (cont'd)

actions are critical. Crown land is not managed for invasive plants and ministries have no budget for this. Alberta, for example, has teams working on Crown land issuing tickets for improper ATV use and leaving a campfire unattended, and it rewards farmers and ranchers for invasive plant management.

**A:** Health and education dominate the provincial budget. It's a matter of galvanizing the public around the issue. Find the magic link that makes this real for the public. Government is taking a "one-land" approach. Groups like the IPCBC are key – he welcomes ideas.

**Q:** Could the Conservation Framework be moved to a stronger status and legislated?

**A:** The provincial government is aware, we are the only province without SAR legislation. We also need to extend it to private land. The task force will produce a report in June, and we should hear something by the end of the summer.

**Comment:** 'Supernatural BC' gives people an illusion that BC is fine. After the Olympics, we should tell the public that "it ain't natural no more."

**A:** Take advantage of the spiritual point of view. We're starting to trip some thresholds. Conservation can give us the capacity to absorb stresses, but we definitely cannot predict.



## The Weed Alert Program in Victoria: Using Weed Spotters for Surveillance

**Sarah Partington, Department of Primary Industries (Australia)**

Biosecurity is very important to the Australian government. A risk assessment is conducted for all new plants after entry. Biosecurity has a risk-return approach to protect the economy, environment, and human health from introduced species.

Individual states manage their invasive species using different approaches. Weed Alert is a state-wide program that strives for "no serious new weeds are introduced to Victoria, and the highest risk incursions are eradicated." Victoria state has 25 listed species, and potential weeds for the future are also examined. The goal is to eradicate them from the state.

Weed Alert team members collectively address all 40 roles in the program, including public contact, compliance, threat of new species, incursion control, on-the-ground delivery, and training Weed Spotters. A key activity is surveillance and early detection. Eradication is very cost-effective and requires good surveillance and early detection, and delimiting the species where it could establish.

Victoria has over 2400 registered Weed Spotters from the community, government, and industry. Their affiliations with target groups affect recruitment. Requests are received to spot insects as well, but they have to keep it to plants. It's important to have spotters in "peri-urban" areas where invasive plant migration can commence.

The Weed Spotters' work is helping the general public to become involved. Good quality training yields accurate reports, but only up to a maximum of 10 species to spot. Meter readers and postal workers are engaged where problem plants have been found. They are currently targeting Weed Spotters recruitment, training, engagement items, and follow-up time. Limited training and poor communication lead to false reports, or reports to the wrong agencies.

### Tools for Engagement:

- Powerpoint presentations developed by coordinator
- Live samples of species to enhance learning
- Hands-on activities during training
- Email link/hard copy of presentation
- Brochures/references with simple identification characteristics, reporting methods
- Calendar, and more
- WeeDeck (appears similar to IPCBC carabiner)

## Questions and Comments

**Q:** Do Weed Spotters contact politicians often?

**A:** Yes, politicians know about Weed Spotters and talk about them. There is high media attention, and this helps increase reports.



Sarah Partington

## The Washington State Program for the Control of Invasive Knotweeds

**Marshall Udo, Washington State Department of Agriculture**

Washington has four species of knotweed: Japanese, giant, Bohemian, and Himalayan. All species are Class B noxious weeds and on the quarantine list. Every one of Washington's 39 counties has at least one species of knotweed. Knotweed can grow from sea level to mountain passes but is most abundant along shorelines, and it has numerous negative impacts. Survey efforts are believed to be less than the actual distribution.



Marshall Udo

Under the Washington State noxious weed control framework, the state Department of Agriculture provides resources to groups to implement knotweed control. Over \$3 million has been spent since 2004, excluding partner contributions.

Some NGOs control knotweed as part of broader fisheries habitat work. Projects are selected based on whether they are already well underway, cost-effective, and have the potential to protect ecologically important areas. Cooperative Weed Management Areas bring groups together to discuss feasibility of projects, methods, and other key players.

Chemical treatment (foliar or stem injection) and manual (bending or cutting, then revisiting to apply herbicide to the lower canopy) showed no statistical difference in efficacy, although there were large differences in density, height,

and diameter of re-growth. Water monitoring at knotweed treatment sites showed no detection of herbicide in most samples. Treatment sites need native plants to prevent incursion of other invasive plant species, e.g., Scotch broom and thistle. Knotweed biomass has been successfully reduced, but persistent re-growth threatens long-term control success. The below-ground rhizome is still significant and supports re-growth. The University of Washington is developing a biocontrol program.

More information is available from [www.agr.wa.gov](http://www.agr.wa.gov) and [www.ecy.wa.gov](http://www.ecy.wa.gov) (Washington State Dept of Ecology).

## Questions and Comments

**Q:** What is the impact of knotweed on fisheries?

**A:** A U of W grad student (Lauren Ergenson) published a paper in 2009 about reduced juvenile tree species from knotweed competition. Other are seeing and documenting a link between knotweed and decreased ecosystem services.

**Q:** How do you manage public outcry over herbicide use in riparian areas?

**A:** Local groups are the best judges of reactions. The proposal addresses that. Landowners must approve (in writing) the use of herbicide on their property. It often means that licensed professionals are applying rather than private landowners.

## Increasing Aboriginal Participation in Invasive Plant Management throughout British Columbia

**Laurie Vaughan, Fraser Basin Council**

Aboriginals (Indian, Metis, and Inuit) comprise 4.4 percent of British Columbians, with half their population in northwest and northern BC. The largest population segment is 17-25 years of age. British Columbia's 1650 Indian Reserves total 0.36% of the province's land.

Potential losses from invasive plants include: medicinal plants (link to health), transfer of knowledge and practices, cultural practices (gathering), food sources (or increased cost of managing food crops), biodiversity – including small edible plants, habitat especially for game and fish, agricultural land, non-timber forest products (pine mushrooms, medicine plants), fewer trappers, tourism potential, and gravel pits due to infestation. Indian and Northern Affairs Canada and individual bands are



Laurie Vaughan

responsible to manage invasive plants on reserves, which are subject to federal environmental legislation. The Environmental Stewardship Steering Committee at the federal level through INAC produces the strategy.

The First Nation Land Management Act has a 1996 framework agreement originally signed by 14 communities and approved in 1999, and it has expanded to 29 signatories. Other groups that provide support to manage invasive plants on reserves include Natural Resources Canada, the First Nations Forestry Program, and the Job Opportunities Program.

Aboriginals have the highest involvement in the north through the Northwest Invasive Plant Council (NWIPC) and are working with nine communities. The high aboriginal population living in many remote areas can provide experienced crews for this large region. Aboriginals are also involved in invasive plant management throughout BC. The NWIPC encourages partnerships and oversees training, awareness activities, and data entry.

Impacts on medicine plants and other resources cause communities to regard invasive plants very seriously. For example, the Prophet River Band under Treaty 8 has a how-to manual for dealing with invasive plants.

Jurisdictional issues are a challenge because of different roles for all levels of government and different federal land. There is a complex of groups to deal with to get funding, permission to treat, and band elections can change priorities.

Solutions cannot include quick fixes. Long-term commitment is required with the will to move forward by all levels of government with the associated people and financial resources. Forest and Range Agreements with First Nations have no range component with invasive plant management.

The IPCBC is working to involve Aboriginals. For example, Hot Spots had 20 percent Aboriginal workers in 2009, and the Council has established an Invasive Plant Aboriginal Working Group.

## Weeds and Corridors

**Al Planiden, Ministry of Transportation and Infrastructure**

Although corridors are more than highways, the mandate of the Ministry of Transportation and Infrastructure includes maintaining the provincial economy. There is no direct mention of invasive plants, so invasive plant management is conducted from a functional perspective to provide safe transportation, since vegetation can affect sightlines. The Ministry has always had a noxious weed program, but when changed to



Al Planiden



AI Planiden entertained forum participants with a lively, humorous ensemble on invasive plants in BC—a highlight enjoyed by all!

invasive plants, it became difficult with no set lists. There are some common management issues with others on rights-of-way.

BC has a widespread network of roads, many of which travel along the edges of lakes and streams, and through agricultural areas. The potential for invasive plant spread is very high. BC also has a variety of terrain to deal with, along with the installation and maintenance of culverts, ditches, and bridge abutments, creating ongoing disturbance. There are numerous practical solutions to minimize ground disturbance and preserve existing vegetation. For example, exposed soils are re-vegetated as quickly as possible, compost is used from on-site wood waste, and contractors use weed-free grass seed and straw mulch.

It is important to plant native vegetation, especially for difficult growing conditions. Persistence with planting is working. Maintenance is coordinated with weed control. Invasive Species Management Plans are developed. Contractors use Environmental Best Practices for Highway Maintenance Activities.

The Inter-Ministry Invasive Species Working Group has expended from the former Invasive Plant title. New approaches are being taken, such as policy change to cover invasive plants instead of only legislated noxious weeds.

## What is a Weed?" A Look at the Biological and Sociological Definitions, and How They Often Conflict

Dr. Richard Old, XID Services Inc.



IPCBC Director, David Borth, presented Dr. Richard Old with a parting gift to thank him for his presentation and post-forum workshop.

Most people see plants as a few "good guys" (crops), a few "bad guys" (weeds), and then everything else. However, it's not that clear with all the overlapping relationships. It is difficult to define a weed – there are many definitions and some of them conflict.

For a biological definition, a weed is a species that displays most or all of the following characteristics:

1. Invasive
2. Aggressive/competitive
3. Highly reproductive
4. Displays rampant growth
5. Favoured by disturbance
6. Genotypically (at a genetic level they are variable and can survive long enough to adapt), phenotypically (variable in what they look like), and environmentally plastic (grows in large range of conditions and looks different in each)
7. Broad ecological amplitude
8. Mobile
9. Persistent
10. Non-native

A weed is not necessarily a plant! "Plant" is not in the biological definition since weedy also includes insects, animals, and ... people.

## Questions and Comments

**Q:** What does this worst weed, burr chervil, look like?

**A:** It is like a miniature poison hemlock with burrs that detach and stick.

**Note:** Lynda Wilson agreed to provide a photo of burr chervil for the IPCBC website.





## Cross Canada Check-Up: Spread the Word, Not the Weed

**Todd Boland, Memorial University of Newfoundland Botanical Garden**

Newfoundland-Labrador does not have an invasive species council; instead, this type of work is done through the Memorial University of Newfoundland Botanical Garden, which has a policy on invasive alien plants.



The progression of invasive plants and "come from aways" has now reached 35 percent of all flowers. Many species are from soil and gravel brought in European fishing boats, which were dumped on shore to replace with fish before returning. Problem invasive plant species include purple loosestrife, black knapweed, pink clover, hawkweeds, and yellow flag iris (new).

Early funding supported education, outreach to schools, and conferences. The Internet is a powerful tool to spread the word. The MUNBG website has a link to biodiversity and then to invasive plant information, such as stopping spread, the Dirty Dozen, and best practices. "Unwanted" posters were provided to schools with handout materials.

There is a hurdle to make people aware that some plants are not good to grow. "Eyes Across the Province" was developed for reporting of early detections. Student reporting of invasive alien species is part of course curriculum. Speaking on CBC Crosstalk reached all of Newfoundland-Labrador, including rural and coastal communities. One nursery ending sales of an invasive species may help end all sales, through word of mouth and peer pressure among nurseries.

Giant hogweed found along the grand concourse in St. John's led to an article on the front page the Evening Telegram newspaper, and the next day phone calls came in asking for information on how to remove hogweed.

## Cross Canada Check-Up: Natives Gone Wild: Climate Change and a History of Yukon Invasion

**Bruce Bennett, Yukon Invasive Species Council**

Despite low populations, the north does have invasive plant problems. For example, sweet clover is a roadside attractant for elk, which increases collisions with vehicles. The first introduced species was reported in 1883, and almost all



early introductions were through agriculture. Then a second wave of invasive plant incursions was enabled by pipeline construction and building of the Alaska Highway.

In 1979/80, a significant change in stream management involved re-vegetation of streambanks, which led to the introduction of many invasive species. Invasive plant establishment has been further augmented through mine reclamation, horticulture, road development and maintenance, and surveyors' horse paddocks.

Only two-thirds of Yukon's 154 non-native species are persistent. Yukon only has 20 species, and some have already been removed.

Research has shown the number of invasive plant introductions increasing since 1995, possibly associated with climate change. There is a small field of leafy spurge in Yukon; Alaska is very concerned about this species. We need to examine why some species decrease without management and what species are truly invasive. For example, narrow-leaf hawkweed was rare but has expanded up to 400 km away in a few years. Wetter and warmer winters are allowing this plant to survive.

Work on the coast to check all ports showed no introduced plants along the coastline except where sites were seeded. Roadside inventory of invasive plants in 2007 has provided good coverage of invasive plant species and their locations.

## Cross Canada Check-Up: Protecting Saskatchewan's Native Prairie

**Chef Neufeld, Saskatchewan Invasive Species Council**

The *Weed Control Act* is being updated with comments on the revisions from the Saskatchewan Invasive Species Council. All



SASKATCHEWAN  
INVASIVE SPECIES  
COUNCIL

species used to be treated similarly, but have recommended moving to a 3-tier system with prioritizations: Prohibited Noxious (illegal to transport, sell, or purchase), Noxious, and Nuisance (downgraded some species that are not a high concern). Instituted stiffer penalties. SISC helped with adding species to the list. Will add horticulture and aquatic invasive species to the list in Fall 2010. Firsts for the Act – species not yet escaped, and aquatic species, can be included.

The Saskatchewan Invasive Plant Council (SISC) collaborated with Alberta and Manitoba for the first time this year on their invasive species calendar, which was a better use of resources.

One population of flowering rush was located south of Saskatoon on private land. The landowner did not know about it, but was concerned about being reported to the weed officer. He clipped flowering heads with the

landowner's permission, collected information on the site and characteristics, took pictures, and GPSd the perimeter. Removing all flowers and seedheads prevented movement into other wetlands and a pitchfork was used to pop up roots. A plan was developed for permanent control, which is expected to be a 10-year program.

SISC partners with the City of Saskatoon, e.g., gypsy moth monitoring program. The Canadian Wildlife Service is advising federal managers to control existing crested wheatgrass stands, and also smooth brome control, but neither species will be put on the noxious list due to the species' economic values. SISC has assisted the Nature Conservancy with monitoring of their properties. SISC also chairs the 30-member "Caring for the Prairie" program, and regularly provides articles to Gardener for the Prairies magazine.

## Cross Canada Check-up Questions and Comments

- Q. for Bruce:** When looking at climate change and invasive plant spread, did you look at seedbank analysis in relation to climate change?
- A:** There are no real studies since there are no Canadian universities north of 60° latitude. Most work is observation work, so we have to base on local knowledge. Sweet clover pulling showed declines to eradication after four years; it seems most seed germinates in the first year, making control an option. Alaskan partners are doing some good work.
- Q:** Alberta is proclaiming its new Weed Control Act later this year, which will entail moving from 3-tier to 2-tier (prohibited and noxious), and adding 39 species to the list. A significant invader is caraway, which is a contract crop in Saskatchewan. How can it be controlled?
- A. by Chet:** Was unable to get all species proposed onto the list. Saskatchewan is cultivating caraway for the spice trade to India. Has not found caraway invasive probably because where it is growing is surrounded by more agriculture, and the climate and soils prevent spread.
- Q:** Why was herbicide (picloram) not used on the flowering rush instead of manual treatment?
- A:** The landowner did not want herbicide, and we are not allowed to use herbicide in water. Only a small portion could have been treated along the edge, but the landowner did not allow.

## Bioenergy Crops: A New Pathway of Invasion?

**Dr. Ann Eastman, Ministry of Agriculture and Lands**

Biofuels include ethanol, biodiesel, and biogas. They matter to the invasive plant management world because important issues such as climate change, peak oil, and energy security, are affecting policies designed to reduce greenhouse gas emissions and support renewable fuel production.



**Dr. Ann Eastman**

BC and the federal government have targets for renewable (biofuels) content in gasoline and diesel. The federal biofuels content requirements could require 5 percent of Canadian cropland. A recent UN report indicates that 7-30 percent of total arable land would be needed to meet 10 percent of the global fuel demand predicted for 2030.

The sustainability of biofuels is focused on evaluations of productivity and energy consumption. For example, energy balance – amount of energy used to grow, transport and convert corn to ethanol compared to the energy content/yield of the ethanol produced. First-generation biofuels are made using well-known technologies such as fermentation, using food crops, such as corn and sugarcane. Consequently, there are increasing questions around efficiency and the food or fuel dilemma. There are concerns around the fact that currently one-third of the US corn crop was used to produce ethanol to provide 10% content in half the fuel supply. And, with global use of biofuels expected to double from 2009 to 2015, it is clear that the growing demand cannot be met by these first generation biofuels.

Second-generation biofuels are made from feedstocks such as waste, biomass residues or dedicated energy crops and use improved conversion methods. These biofuels have smaller carbon footprints and improved energy balances; to what extent is dictated by the feedstock and the process.

Issues with dedicated biomass crops include social impact from changing land use, deforestation, decreased biodiversity, and invasiveness potential. "Non-invasive" is included as an important biomass crop characteristic, but it is not a priority. Simply put, the ideal characteristics of good bioenergy crops are the same characteristics used to describe invasive plants.

Examples of species of concern include giant reed grass and its environmental impact, especially as large plantations

are under consideration. *Miscanthus*, a perennial grass from Asia, is being planted in small trials in the Lower Mainland. It requires a few years to get established, then grows quickly and produces biomass for up to 15 years that can be used for direct burning in biomass boilers or used to produce ethanol or fibre pellets.

*Camelina sativa* is another new bioenergy crop in development for biodiesel production. It can fit in existing crop rotations, has high oil yield and is a key oilseed candidate for biofuels and aviation fuel. *Thlaspi arvense* is another species being considered for biodiesel production, as it contains 35 percent oil. There are concerns from farmers on the invasiveness problems it will create, however, if used in rotations with other winter annuals.

In spite of these growing concerns, few attempts have been made to quantify the potential invasiveness of biofuel species. Recent work (2009) in Hawaii using a weed risk assessment of potential biofuel crops revealed that 70 percent of biofuel crops pose a high risk of being invasive, compared to only 25 percent of non-biofuel species.

Some suggested actions include weed risk assessments, evaluating biofuels at a regionally appropriate scale, for environmental tolerance; conduct climate matching analysis; consider the potential for cross hybridization; and quantify the risk of escape.

## Questions and Comments

- Q:** What do we know about the behaviour of biofuel species in BC?
- A:** Only work done at coast, some varieties being tested are sterile, others are not. Once established *Miscanthus*, forms a dense stand with dense rhizomes - not much else can get in.
- Q:** What regulations are in place and how much time is there to do research on invasiveness?
- A:** Very little work has been done, not a lot of time to do it. Only the one study in 2009 involved a comprehensive, regionally specific assessment. Now is the time to it.
- Q:** University of Northern BC research on poplar trees - are these being considered?
- A:** Poplars have been tested for potential for bioenergy; however, good growth requires use of more inputs such as fertilizers and use of arable land.
- Q:** Biofuels are harming older vehicles, so why are we not utilizing more of the abundant natural gas which is cleaner?
- A:** There are not a lot of natural gas or propane vehicles out there to use natural gas. Another driver for biofuels use is to reduce greenhouse gas emissions. Gas and diesel have carbon impact, add to the problem, whereas biofuels are considered low or

## Questions and Comments (cont'd)

lean carbon and when they displace fossil fuels result in a net reduction of carbon added.

- Q:** Has any work been done on burning invasive plants for fuel?
- A:** Not aware of any specific work; there has been some work using invasive plants for energy. The challenge is energy density of the material and the energy and infrastructure needed to bring to a processing facility. It's a idea to incorporate invasive plant waste into bioenergy production where possible.
- Q:** What happens to a stand of biofuel crops after the 15 years?
- A:** With respect to *Miscanthus*, some stands are still being harvested after 20 years. But the impacts on future cropping, on biodiversity and soil health, have not been well-studied.

## Invasive Species, A National Perspective

**Robert McLean, Executive Director, Habitat and Ecosystem Conservation, Environment Canada**



IPCBC Vice-Chair, Kristy Palmantier, thanked Robert McLean for his presentation with a parting gift.

National program managers for Environment Canada protected areas and migratory bird sanctuaries manage with only \$4 million, which is a challenge. A lot of projects are very site-specific. Provincially, the MOE has a much larger scale of activities.

Climate change is a huge concern. One study showed that



80 percent of protected areas will have a 20 50 percent change in species in the next 90 years. Systems are undergoing change and we are making decisions on small pieces of land. Instead, we need to be looking at broader landscape-level management for longer time periods to protect biodiversity. For example, boreal caribou need management of habitat at a large scale and over a long period of time.

#### Solutions include:

- Systems that can adapt themselves.
- The Invasive Alien Species Strategy for Canada is an \$85 million investment for four departments. The strategy was intentionally kept simple, and it emphasizes prevention, with a focus on pathways rather than species. Partnerships are built on the roles of all players.
- There socio-economic case for the IAS program continues to be strong.
- We are working on a second national forum in March to develop a national governance method.
- Invasive Plants need more as the strategy is not enough. Under the Canadian Food Inspection Agency (CFIA), the Canadian Invasive Plant Framework needs to be taken to the next level and be action-oriented so they understand what they are buying into to get funding support.

The CFIA is preparing to consult an invasive plant policy. Phase 1 will include a least-wanted pest list, and Phase 2 will be on commercial and aquatic plants. More work is also being done to respond to the Auditor General's recommendations. The Canadian Invasive Plant Framework needs to progress.

Funding for the Invasive Alien Species Pilot Project was to end in 2009. It is currently unknown if IASPP will be included in the federal budget, although invasive species continues as a priority area. If it is approved, then a call for proposals will probably be in March, with funding announced in May or June.

## Collaborating to Combat Invasive Plants in BC: Successes, Lessons Learned, and Moving Forward

### *Duncan Barnett, Invasive Plant Council of BC Chair*

Invasive plants were first brought in by explorers, then the Gold Rush brought farmers. Fur traders had gardens, grew vegetables, and used spices from the old country.

Invasive plants impact us all. It's a tricky issue and it's complicated, with coastal and Interior plants, and issues around horticulture and aquatic species. The threats are huge. Invasive plants are like slow-moving wildfire, and they produce significant social and economic impacts. Climate change will increase the impacts. Everyone has a stake in this. Mixing of plants is insidious, and the problem is huge. Iona Campagnolo, the former BC Lieutenant Governor,



IPCBC Vice-Chair, Kristy Palmantier, thanked parting Chair, Duncan Barnett, for his dedication and hard work that helped the Council in its first five years of development.

talked to us a few years ago about explorers. We have done a poor job of managing the people, but hopefully can do a better job of managing the plants.

There are so many perspectives on First Nations and medicinal plants and how to fit into the context. Invasive plants can be good, bad wanted, unwanted, desirable, and undesirable.

We know it is a billion-dollar problem, but what is the answer? It is a people problem. People have different perspectives, and do what they are doing. We know we need people going in the same direction to get the political will in place.

In the urban environment, some things are going on that most people think are unacceptable situations – we feel we need to do something. But why do we ignore the issue of knapweed, hogweed growing up a house, or a field of orange hawkweed? There are laws for unsightly premises, but society has not made invasive plants a priority.



The Nibble and Network area had many displays, including one by N.A.T.S. Nursery.

N.A.T.S. Nursery and GardenWorks were recipients of "Leading the Way" awards for voluntarily committing to stop growing and selling invasive plants.

The IPCBC has been working on this for the past few years, focusing on collaboration. The profile of invasive plants increased with the Chutter Panel, then Canada's worst weed across the country on CBC Radio, and the UN Report #6 on invasive plants with things to protect biodiversity. As well, there has been Auditor General work. Mike McCardell of BCTV was interviewed at our forum in 2009.

We need to make it understandable and readable, and keep on trying.

Healthy ecosystems require finding a balance for invasive plants to be in a state of equilibrium. We also need to do more research so we can make better decisions on risk, and restore and reclaim, not just treat. Remember: "The right plant in the right place." We want healthy functioning ecosystems.

#### Take-home messages:

1. Collaborate with others to produce more results.
2. Find the balance of invasive plants in ecosystems, with the associated tolerance levels.
3. Establish a long-term fund as it is critical to the future of invasive plant management.

## Thursday January 21 OPTIONAL WORKSHOP

### Beyond "Green Leaves and Pretty Flowers": A hands-on class in plant morphology

**Dr. Richard Old, XID Services Ltd.**

This fun, hands-on workshop taught participants to identify key distinguishing features of any plant they encounter, regardless of whether they can identify the species. Participants learned to look closely at the characteristics of the plants, including flowering and fruiting parts, leaves, root systems, stems, and general size and shape, and select the most important distinguishing characteristics. Participants were familiarized with the XID Weed Database to use these characteristics to identify species.

**XIDservices**  
weed identification



During his presentation, Tom Woolf addressed the issue of aquatic invasive species in Idaho.



The 'Nibble and Network' display area.