GLANSIS Enhancements

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ICAIS

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Acknowledgements

GOALS

Improve access to science-based information on nonindigenous species in the Great Lakes region.

- MAPPING - Support early detection efforts by providing a central database of known locations for each species (avoid reinventing the wheel) and a central framework for reporting new occurrences

- IDENTIFICATION - Support early detection by providing access to information on identification of nonindigenous species (especially those still expanding their ranges and <u>watchlist</u> species)

- MANAGEMENT - Support rapid response by providing one-stop access to information on basic ecology and management options for species (especially those still expanding their ranges and watchlist species)

- **RISK - Support management decision-making by providing access to comparable information on relative risk**

GLRI Enhancements

- **Enhanced bibliographic information** – bibliographic contents of the Sea Grant SGNIS database (including grey literature) have been ingested and are available through the USGS NAS Reference Database interface. http://nas.er.usgs.gov/queries/references/default.aspx

- **51 non-technical fact sheets** for priority species of public interest were developed by IL-IN Sea Grant and are now available through GLANSIS (click on the common name).

- 53 high priority **watchlist species** have been added to the database – those which have been identified in the literature as high risk for invading and becoming established in the Great Lakes. 12 completed fact sheets are in review, the remainder are being worked on by student teams. **See the poster by Dahlstrom et al for details!**

- 11 species have been added as **range expansion species** – those native to one portion of the Great Lakes but which are considered invasive to other portions of the basin. The complete fact sheet for *Ictiobus cyprinellus* is posted. Fact sheets for 5 additional species are in review. The remaining 5 are in progress.

- We've added updated and **consistent impact information** better able to support risk assessment. Information for 145 established species now available online. 35 plants still pending.

- Addition of **management information** — regulations, best management practices and control methodologies – for all the species in the database. 79 management profiles completed, including all established parasites & diseases. Remainder scheduled for summer 2013.

Organism Impact Assessments

- 3 assessments –
  - Environmental,
  - Socioeconomic,
  - Beneficial
- Each assessment has 6 questions.
  - Each question scored 0-6 (or unknown)
  - Each assessment therefore has a possible score ranging 0 (no impact) to 36 (highest impact) and an 'uncertainty factor' ranging 0-6.

OIA Qualitative Scoring

Scoring		
Score	# U	Impact
>5	Any	High
2-5	Any	Moderate
0	0-1	Low
1	0	
0	≥2	Unknown
1	≥1	

Impact Assessment

- Environmental
  - Does the species pose some hazard or threat to the health of native species (e.g., it magnifies toxin levels, is poisonous, a virus, bacteria, parasite, or a vector of one)?
  - Does it out-compete native species for available resources (e.g., habitat, food, nutrients, light)?
  - Does it alter predator-prey relationships?
  - Has it affected any native populations genetically (e.g., through hybridization, selective pressure, introgression)?
  - Does it negatively affect water quality (e.g., increased turbidity or clarity, altered nutrient, oxygen, or other chemical levels/cycles)?
  - Does it alter the physical ecosystem in some way (e.g., facilitated erosion/siltation, altered hydrology, altered macrophyte/phytoplankton communities, changes to substrate (physical or chemical))?

Impact Assessment

- Socio-Economic
  - Does the species pose some hazard or threat to human health (e.g., it magnifies toxin levels, is poisonous, a virus, bacteria, parasite, or a vector of one)?
  - Does it cause damage to infrastructure (such as water intakes, pipes, or any other industrial or recreational infrastructure)?
  - Does it negatively affect water quality?
  - Does it harm any markets or economic sectors (e.g., commercial fisheries, aquaculture, agriculture)?
  - Does it inhibit recreational activities and/or associated tourism (e.g., through frequent water closures, equipment damage, decline of recreational species)?
  - Does it diminish the perceived aesthetic or natural value of the areas it inhabits?

Impact Assessment

- Beneficial
  - Does it act as a biological control agent for aquatic weeds or other harmful nonindigenous organisms?
  - Is it commercially valuable (e.g., for fisheries, aquaculture, agriculture, bait, ornamental trade)?
  - Is it recreationally valuable (e.g., for sport or leisurely fishing, as a pet, or for any other personal activity)?
  - Does the species have some medicinal or research value (outside of research geared towards its control)?
  - Does the species remove toxins or pollutants from the water or otherwise increase water quality?
  - Does the species have a positive ecological impact outside of biological control (e.g., increases the growth or reproduction rates of other species, fills an important gap in the food web, supports the survival of a species which is threatened, endangered species, or commercially valuable)?

Analysis Based On
154 Established, Nonindigenous Species

- 28 Fish
- 18 Mollusks
- 21 Crustaceans
- 6 Annelids
- 2 Arthropods
- 1 Bryozoan
- 2 Coelenterates
- 23 Diseases/Parasites
- 27 Algae
- 26 Plants*

* 28 plants remain to be completed for the full analysis....

Of 462 completed assessments...

97 (21%) received an overall qualitative scores of unknown – "current research is inadequate to support proper assessment".
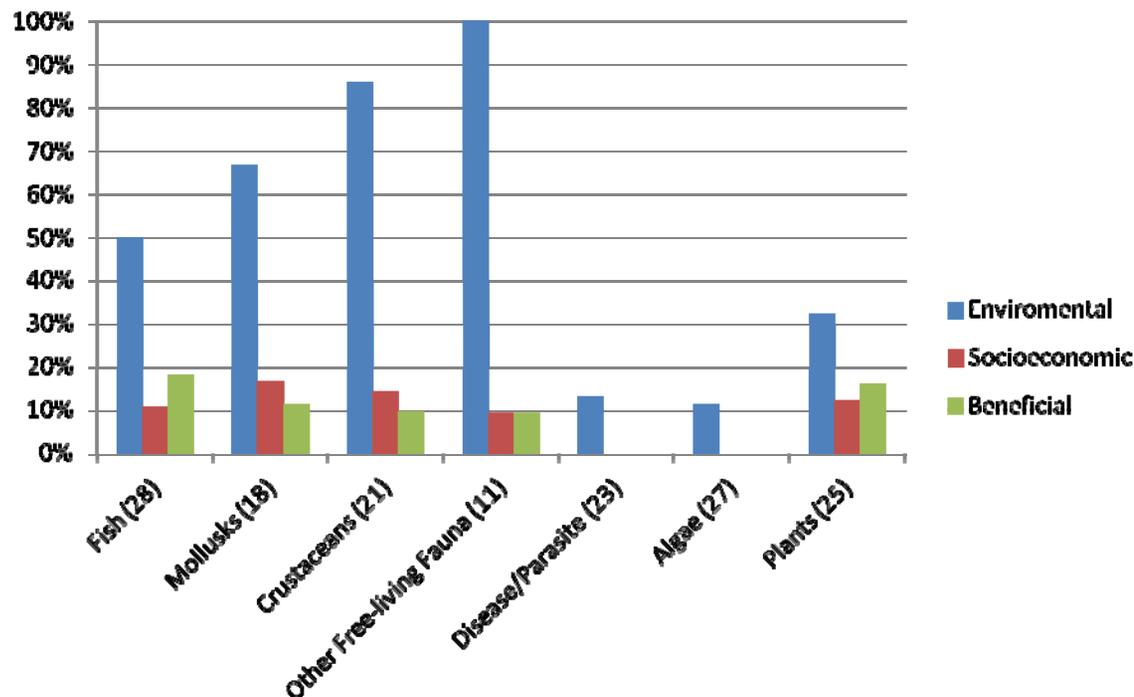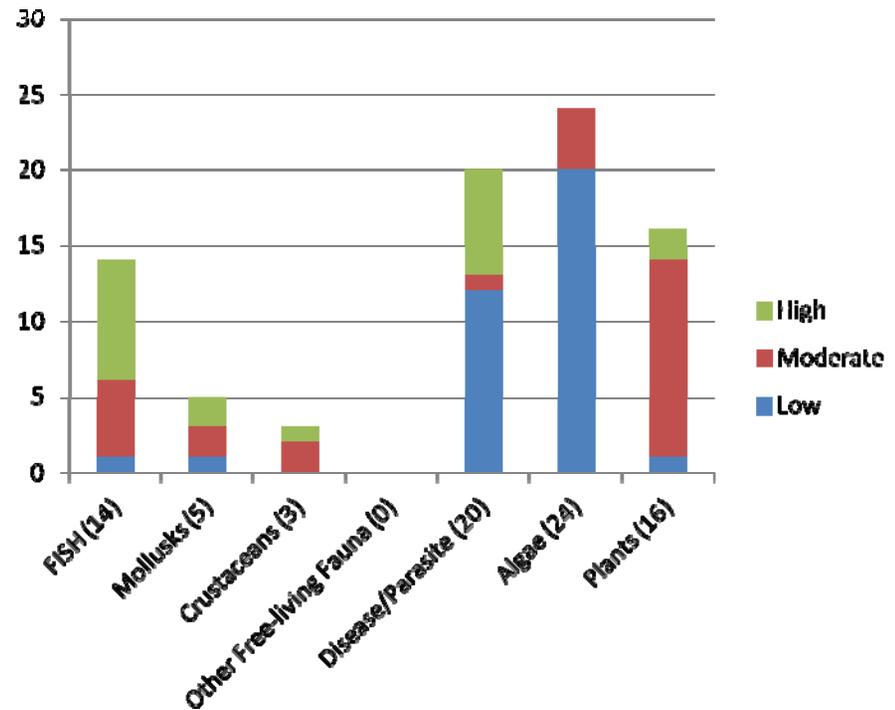
Of 82 established nonindigenous species for which we were able to adequately assess environmental impact…

- 20 species were considered 'high impact' – mostly fish & fish diseases

Top 10
1. Zebra mussel
2. Quagga mussel
3. White perch
4. Alewife
5. Round goby
6. Glossy buckthorn
7. Sea lamprey
8. Common carp
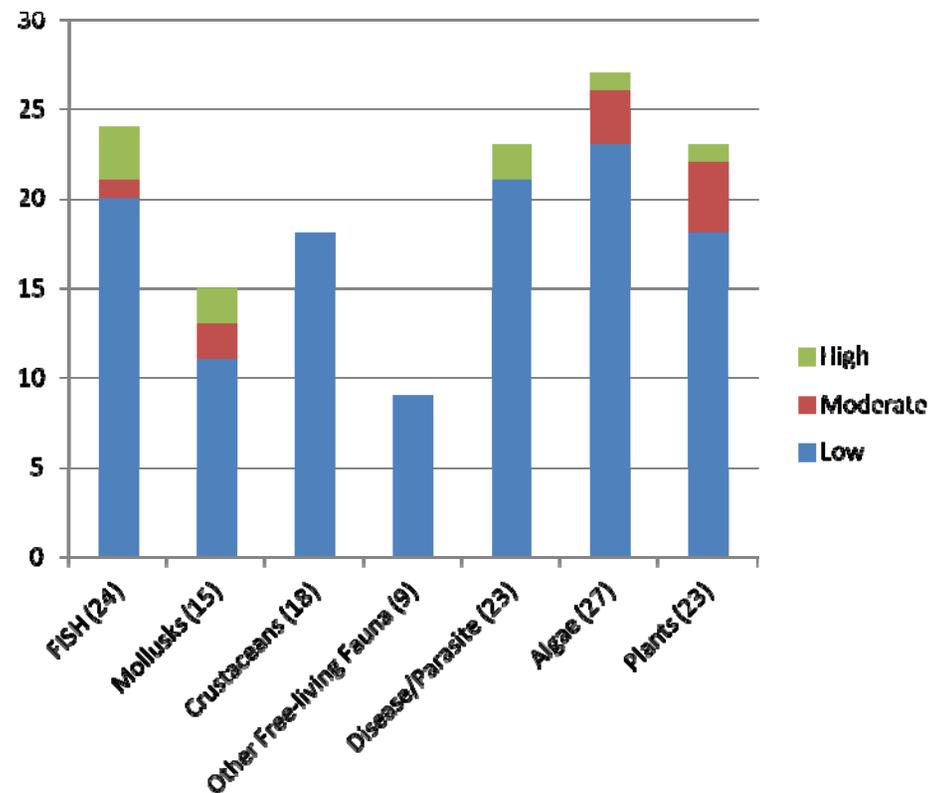9. Rainbow smelt
10. Purple loosestrife

Of the 139 established nonindigenous species for which we were able to adequately assess socioeconomic impact…

- Only 6% were considered high impact

High Impact Species
1. Zebra Mussel
2. Quagga Mussel
3. Sea lamprey
4. Round Goby
5. Bacterial kidney disease
6. Alewife
7. VHS
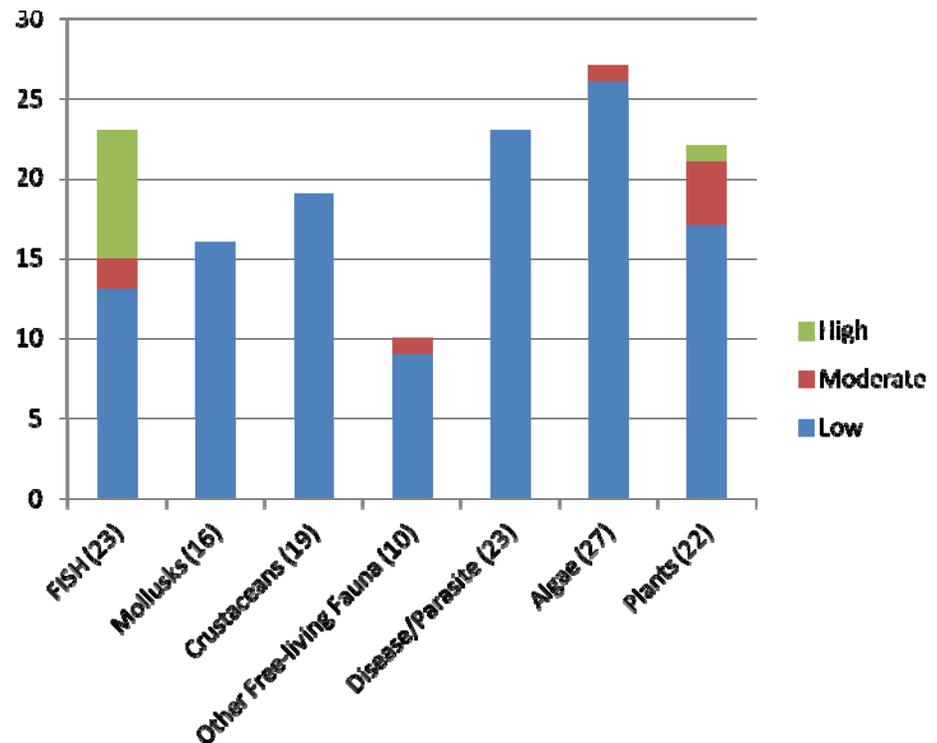8. Nitellopsis
9. Barnyard grass

Of 140 established nonindigenous species for which we were able to adequately assess benefits...

- Only 6% were considered 'highly beneficial'

Beneficial nonindigenous species
1. Rainbow smelt*
2. Chinook salmon
3. Coho salmon
4. Rainbow trout
5. Common carp*
6. White perch*
7. Narrow-leaf cattail
8. Brown trout
9. Alewife**

http://www.glerl.noaa.gov/res/Programs/glansis/glansis.html