Harmonizing Great Lakes Regulated Species: Progress towards reconciling a regional patchwork

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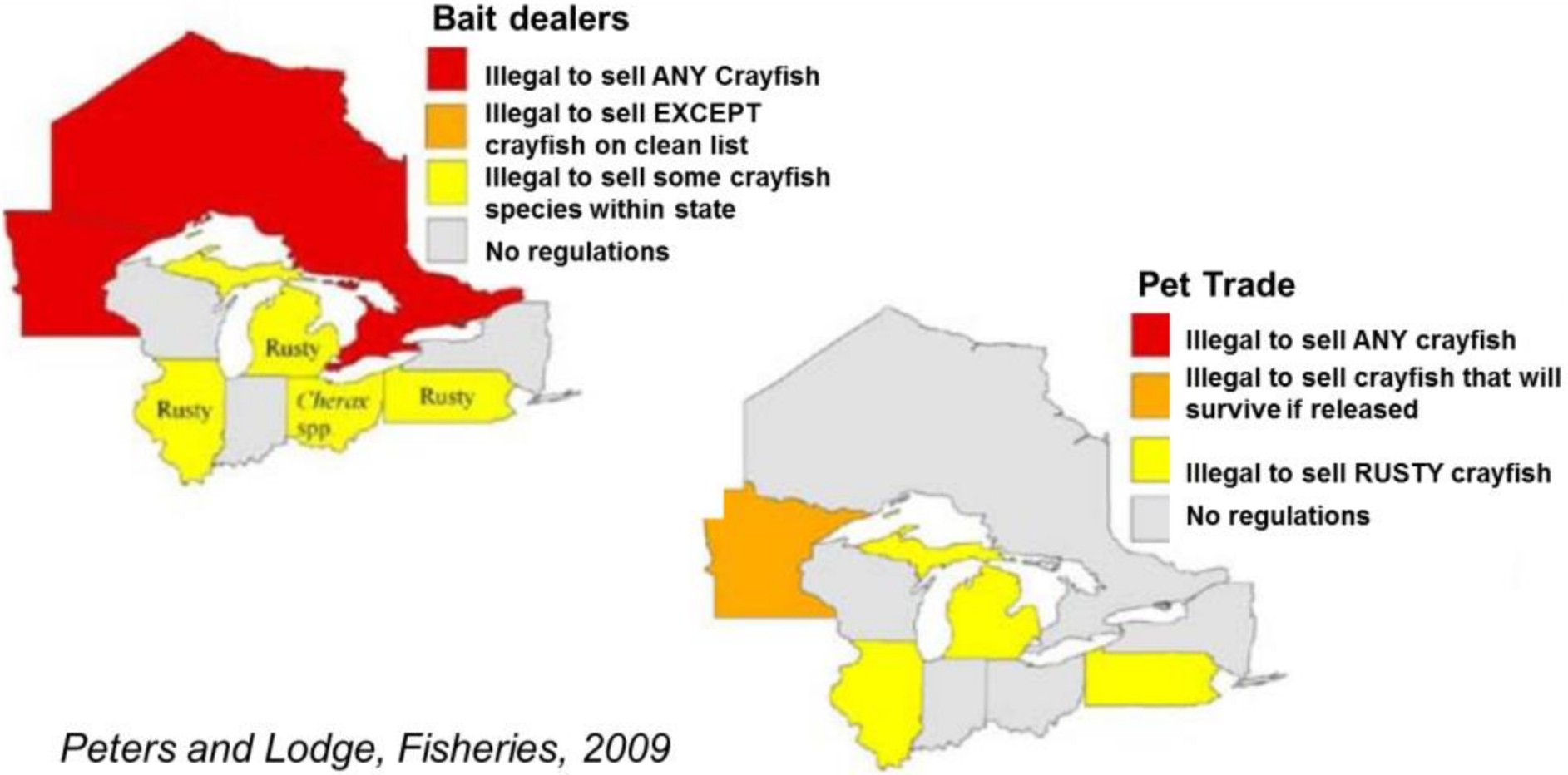
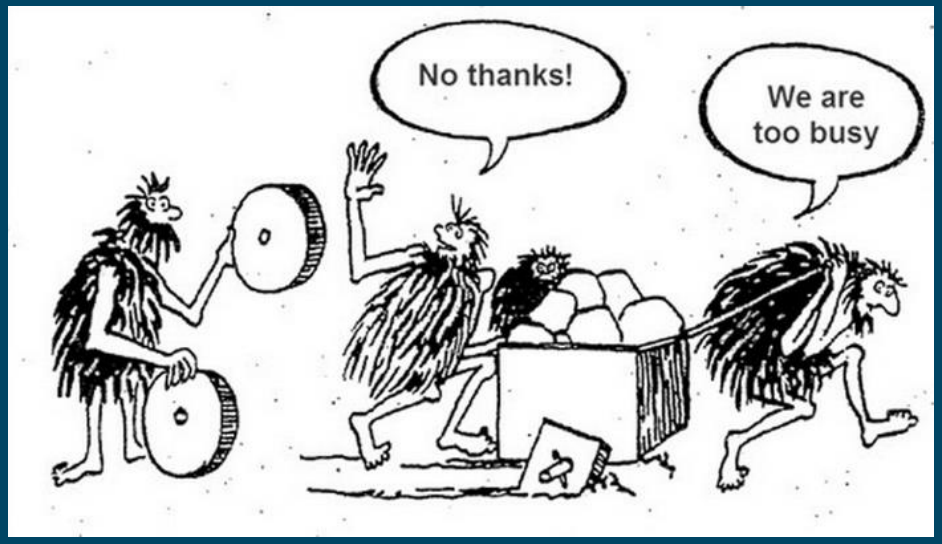
The "weakest link" problem



Peters and Lodge, Fisheries, 2009

Objectives

- To assess and compare current regulated species lists across GL basin and demonstrate progress towards harmonization (since 2008).
- To assess whether there is a group of species for which there is enough evidence to justify regulations across the basin.



Methods

- Collated all regulated species lists across state, provincial and US Federal jurisdictions (2015*)
- Built on work undertaken by Erika Jensen and Great Lakes ANS Panel research committee (in 2008)
- Reviewed different risk assessment approaches being used across basin

**Data presented was updated pre-Canadian legislation and also does not reflect pending regulations for the 11 species proposed for listing as injurious on Lacey Act per recent USFWS rule change (to take effect Oct 31)*

Existing risk assessment information within GLB

- ***Expert panel approach*** (e.g. MN, OH)
- ***Detailed literature reviews*** (e.g. WI DNR, DFO Canada, GLANSIS, USFWS ERSS for Lacey Act Listed Injurious sp. & USDA noxious species listing)
- ***Questionnaire -score based risk assessment tools*** (e.g. USAWRA [*Gordon et al 2012, Gantz et al 2015*], GLANSIS, NY Plant risk assessment method)
- ***Statistical tools/trait-based models*** (Kolar and Lodge 2002, Keller et al. 2007, Howeth 2016, USFWS Bayes Net)

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Common criteria used to assess risk

- Probability of introduction
- Environmental suitability – can species establish, reproduce and spread (climate, and habitat suitability)
- Evidence of impacts
  - history of invasiveness elsewhere
  - competition
  - predation
  - disease
  - economic impacts
  - or human health

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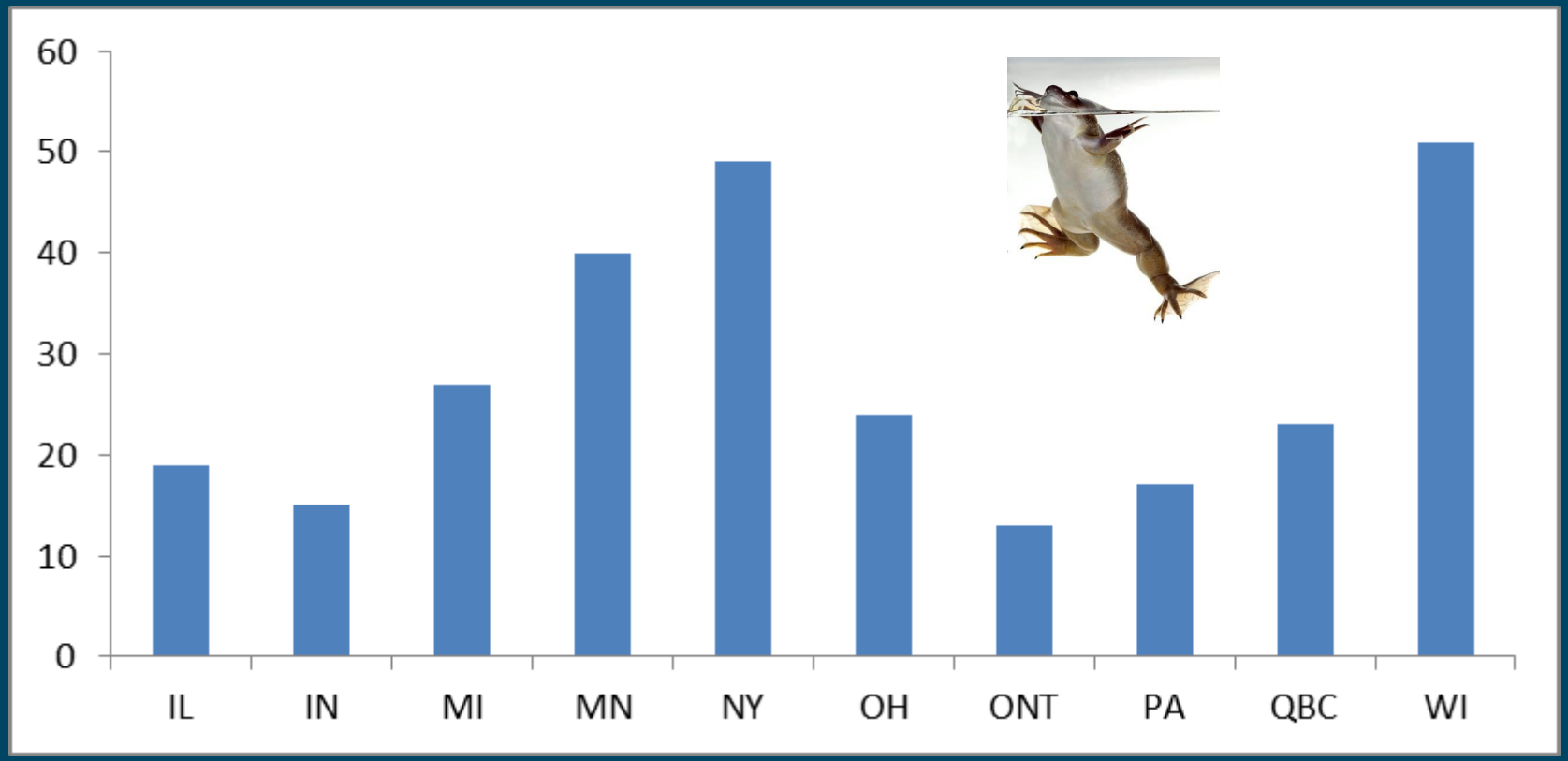
Frequency of listing (state or province) (Animals: 2015)



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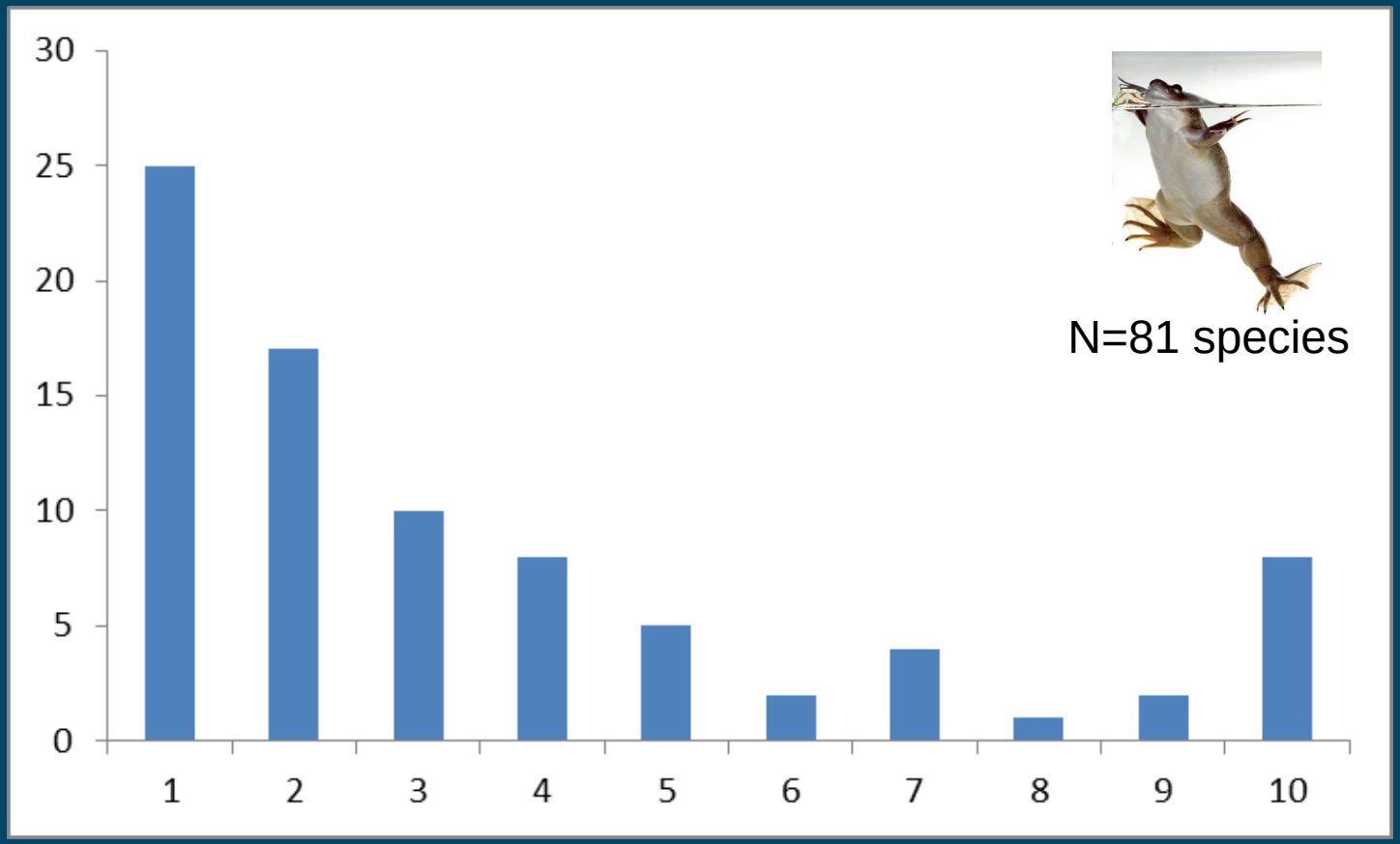
Frequency of listing of each species (animals)



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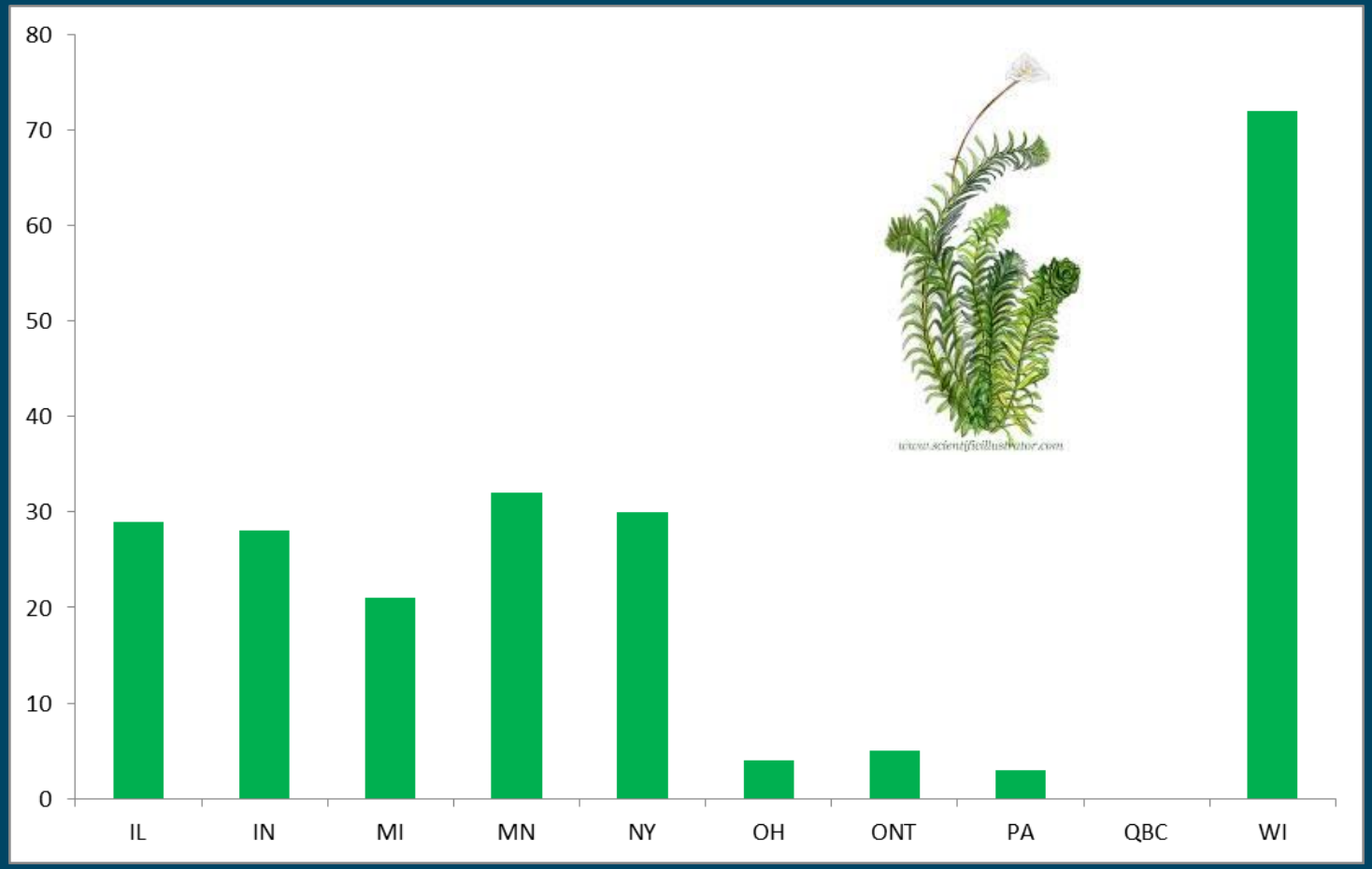
Number of species listed by state or province (Plants: 2015)



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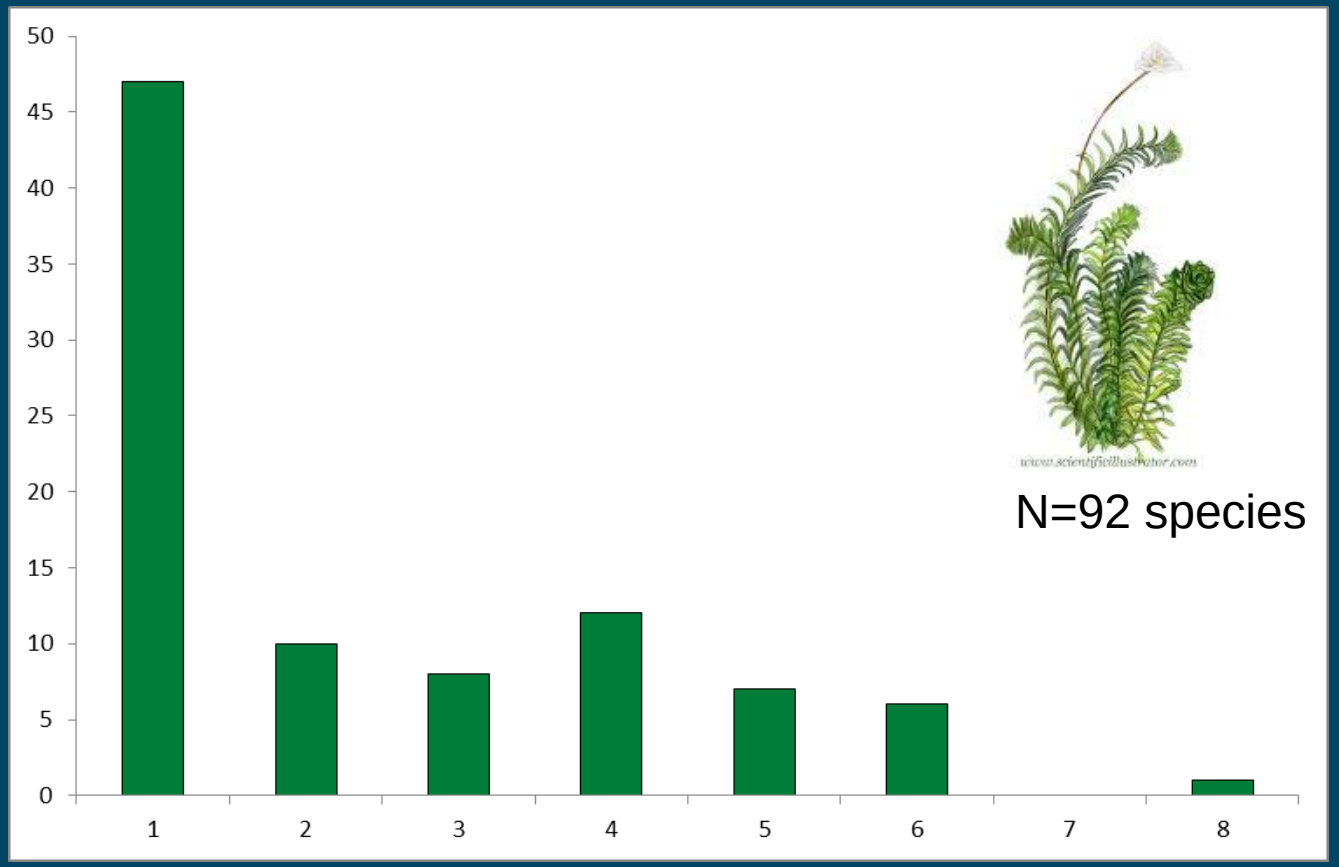
Frequency of listing (state or province) (Plants)



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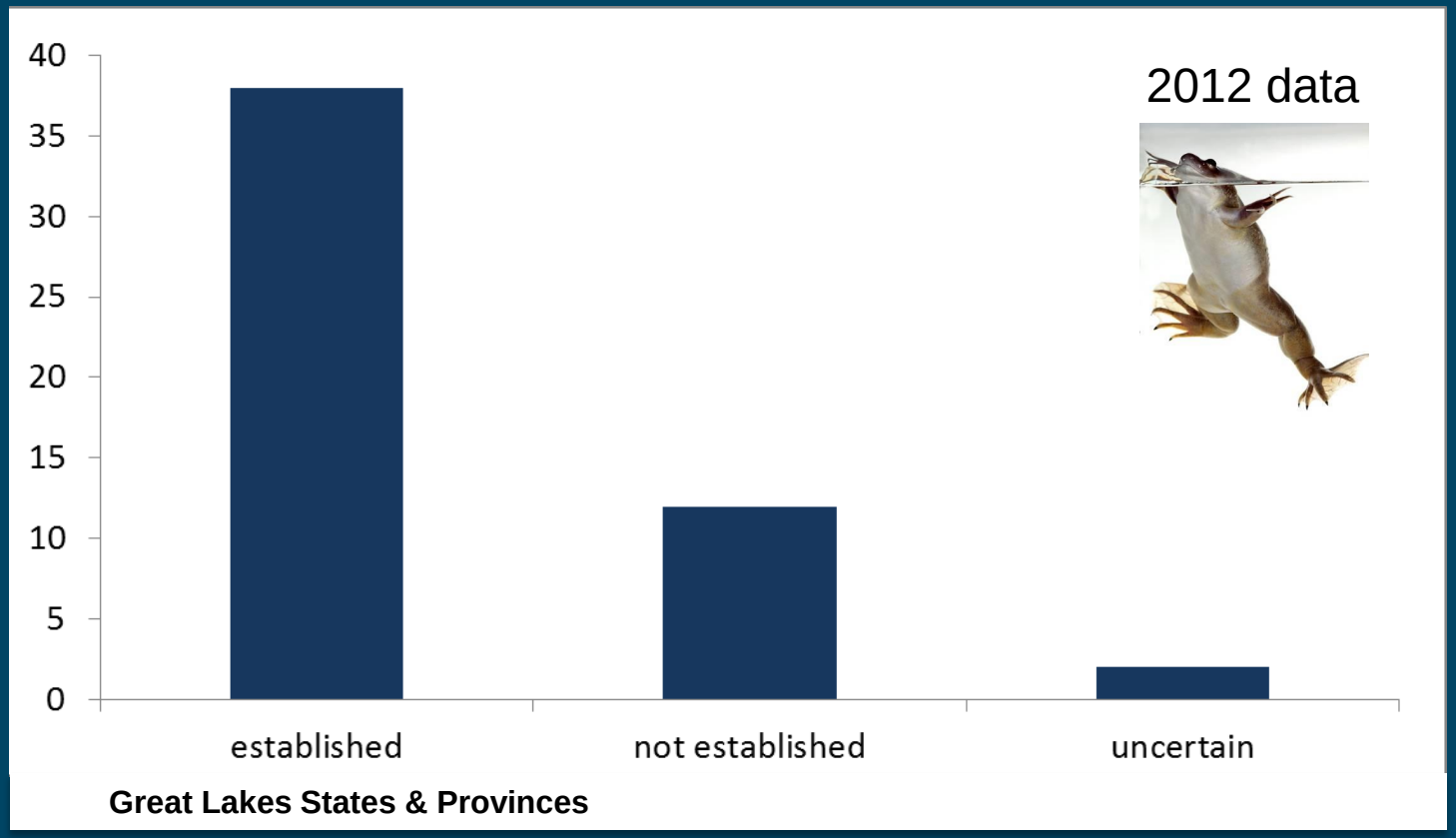
Species Distribution / Status (animals)



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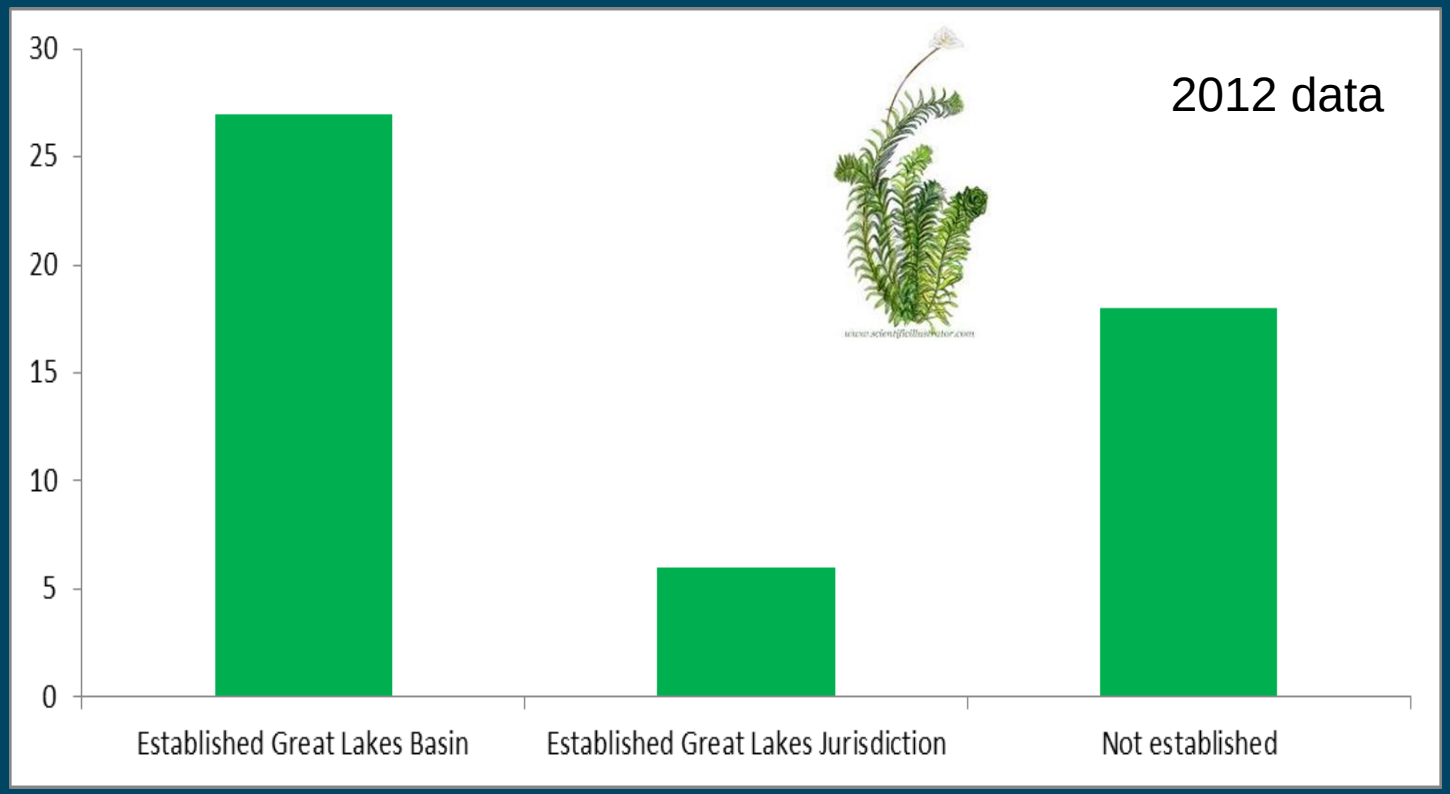
Species Distribution / Status (Plants)



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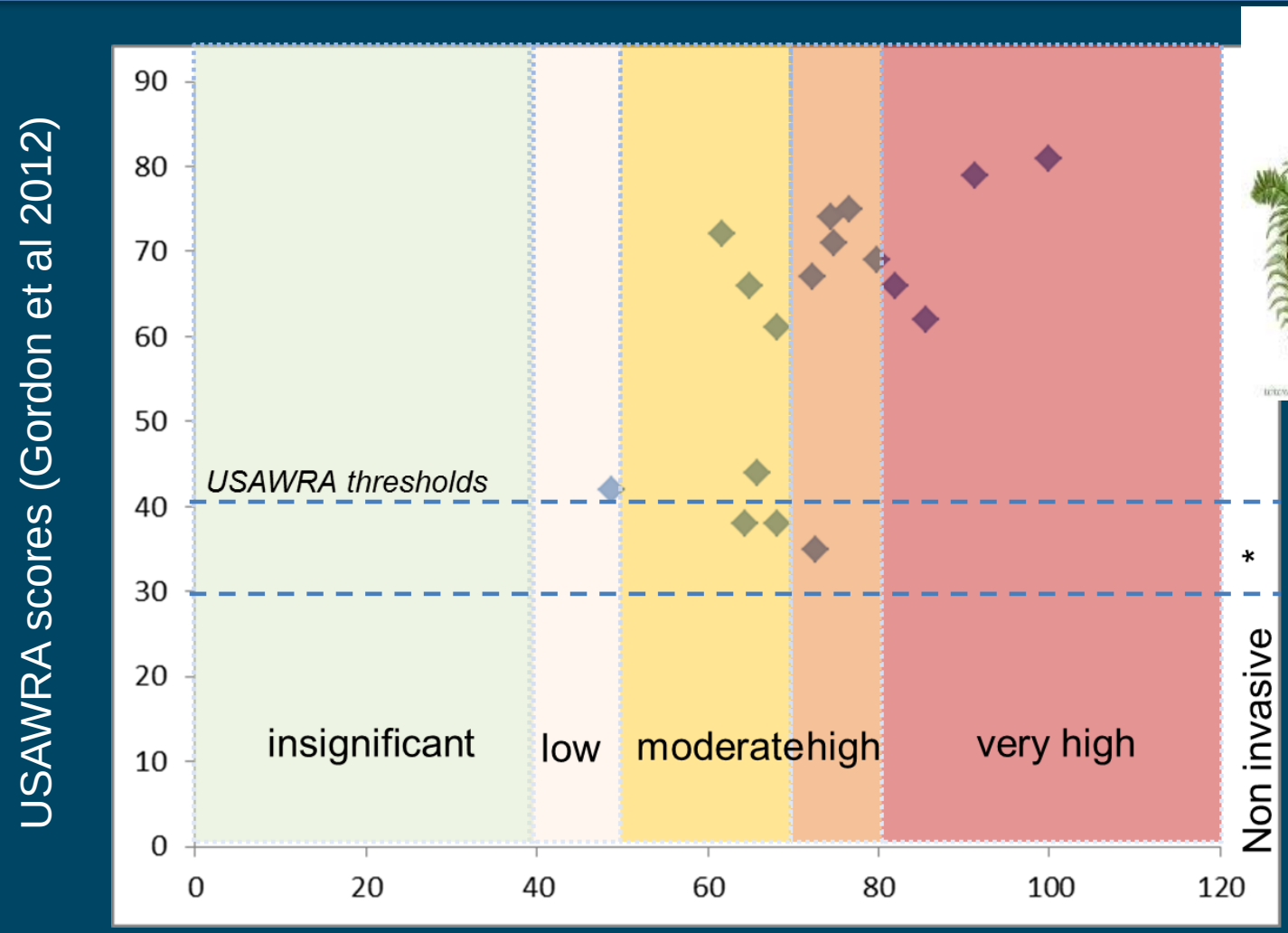
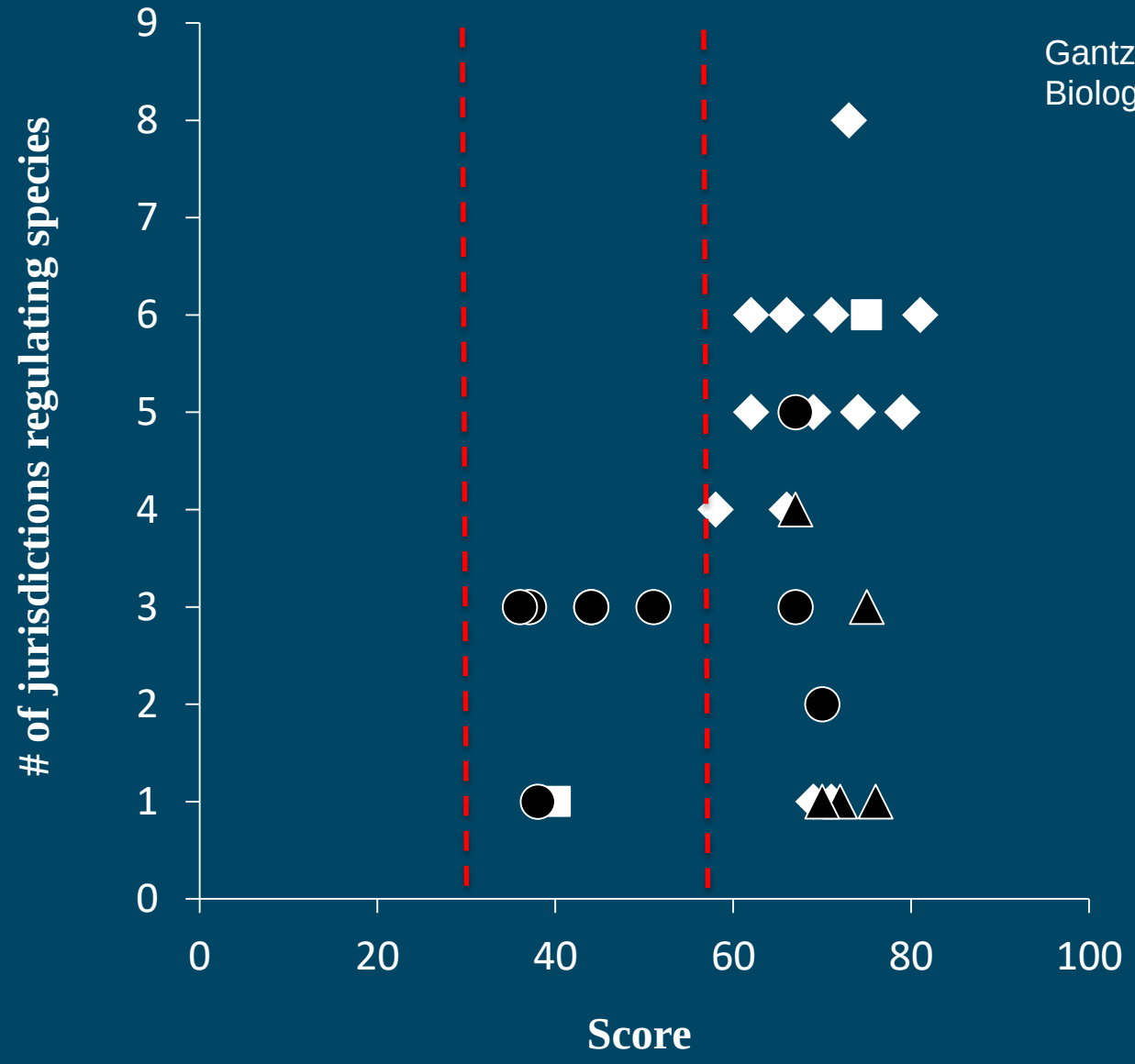
Opportunity for adoption of common risk assessment data



NY invasiveness ranks

(* - requires further evaluation)

GL AWRA score by frequency of listing



Gantz et al. 2015. Management of Biological Invasions.

- Established, invasive
- Established, not invasive
- Native + invasive
- Not established

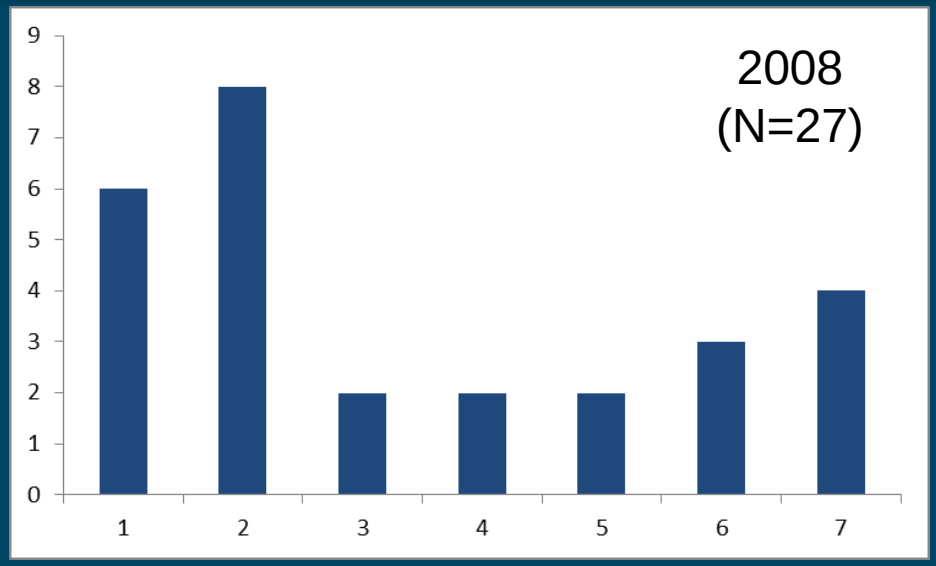
Assessing strength of evidence

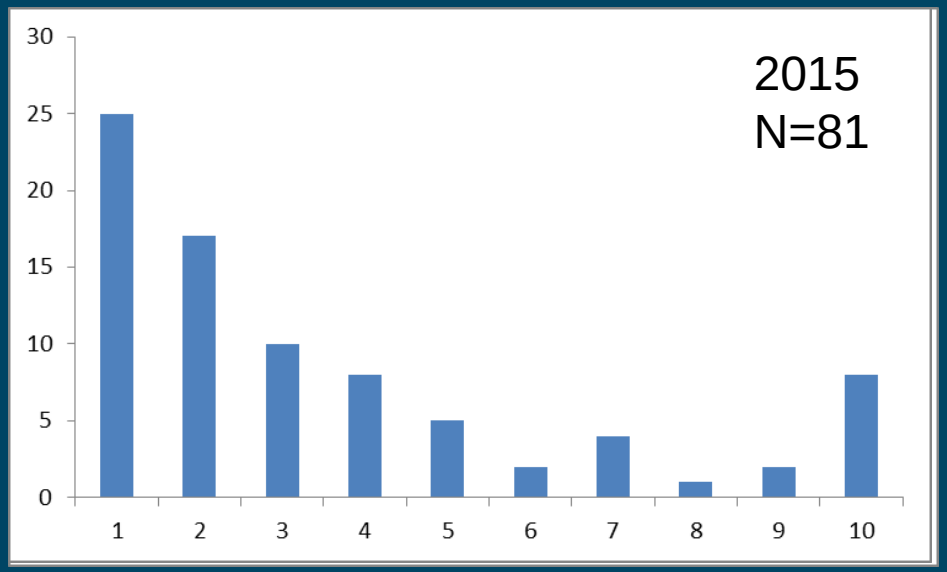
Strength of evidence	Risk Assessments
stronger	Identified by multiple peer reviewed risk assessments & expert panels
	Identified by a peer reviewed assessment and expert panel(s)
	Identified by a peer reviewed risk assessment
	Identified by multiple expert panels
weaker	Identified by one expert panel

Animals – progress

Reasons for progress

- Adoption of risk assessment methods (NY 2013,
- CGLGP “least wanted list”

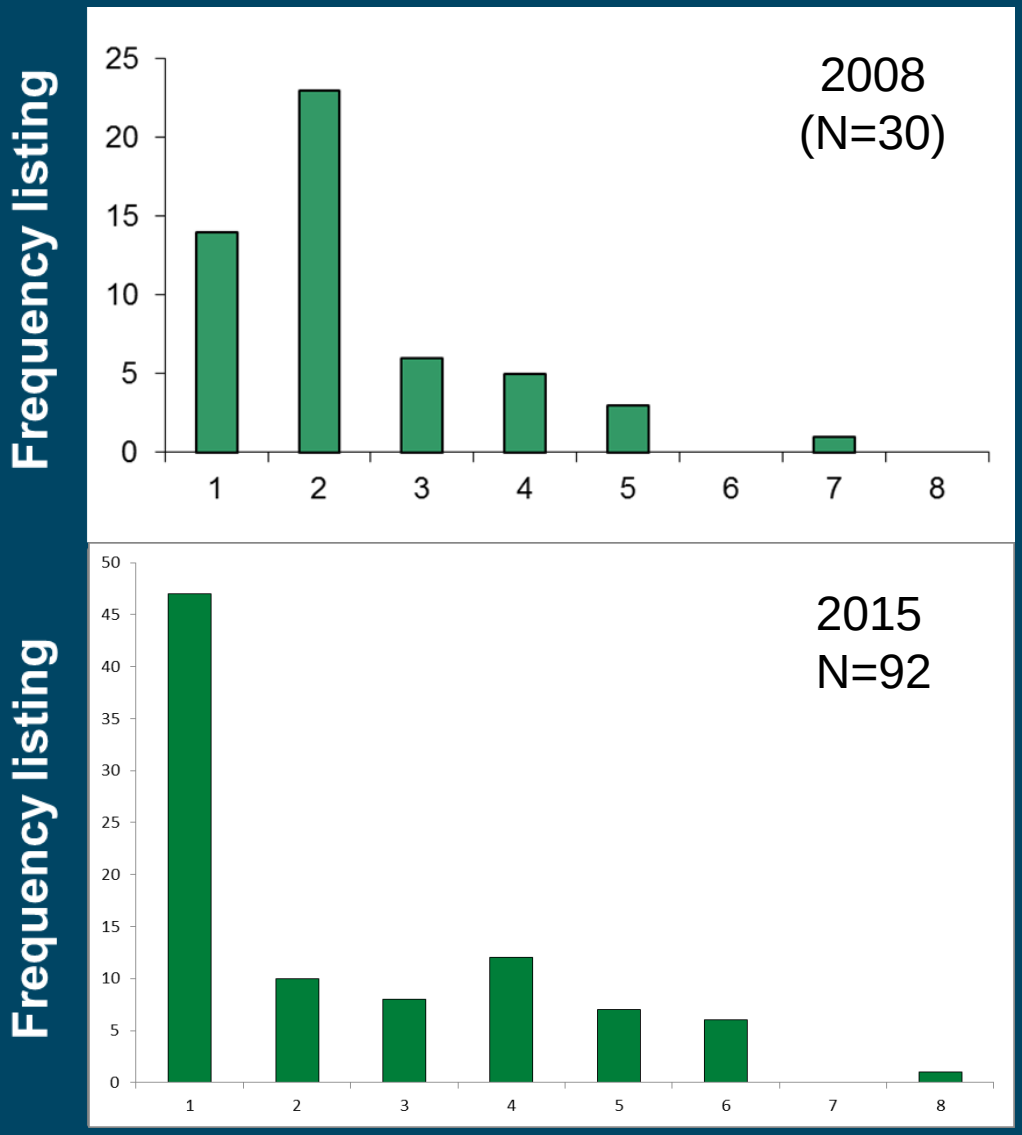




Plants –progress

Reasons for progress

- Adoption of risk assessment methods
- Indiana and Illinois – (GL) AWRA
- New York – Plant Risk assessment method
- Wisconsin extensive assessment processes



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Conclusions

- A wide range of regulatory measures for AIS exist across GL jurisdictions
  - Variety of RA methods & range of management considerations
- … but progress towards harmonization is evident
- Some prohibited species lists appear to be reactive, but models for more proactive risk assessment are emerging
- Adoption of existing approaches or a “strength of evidence” approach could advance progress towards harmonization

Top listed Animals (after least wanted list)

Genus species	Total state and provinces
Cherax destructor	5
Procambarus clarkii	5
Siluris glanis	5
Eriocheir sinensis	4
Limnoperna fortunei	4
Misgurnus anguillicaudatus	4
Morone americana	4
Petromyzon marinus	4
Potamopyrgus antipodarum	4
Pseudorasbora parva	4
Tinca tinca	4
Bellamya chinensis	3
Bithynia tentaculata	3
Bythotrephes cederstroemi	3
Carassius auratus	3
Clarias batrachus	3
Corbicula fluminea	3
Cyprinus carpio	3
Dikerogammarus villosus	3
Gambusia affinis	3
Hypophthalmichthys harmandi	3

Top listed plants

common name	Number of states or provinces
Purple loosestrife	8
Brazilian waterweed	6
Hydrilla	6
European Frogbit	6
Parrot feather	6
Eurasian water milfoil	6
Curly–leaf pondweed	6
Water chestnut	6
Flowering rush	5
Giant hogweed	5
Yellow flag iris or tall yellow iris	5
Oxygen–weed, African elodea	5
Yellow floating heart	5
Mosquito fern	4
Fanwort	4
Anchored water hyacinth	4
Indian swampweed	4
Chinese waterspinach or swamp morning-glory	4
Asian marshweed or ambulia	4
Brittle naiad	4
Duck lettuce	4
Mile–a–minute vine	4
Arrowhead	4
Poison hemlock	3
Cylindro	3
Arrowleaf or false pickerelweed	3
Heartshape or false pickerelweed	3
Phragmites or Common reed	3
Common Buckthorn	3
Exotic bur-reed	3
Water soldier	3