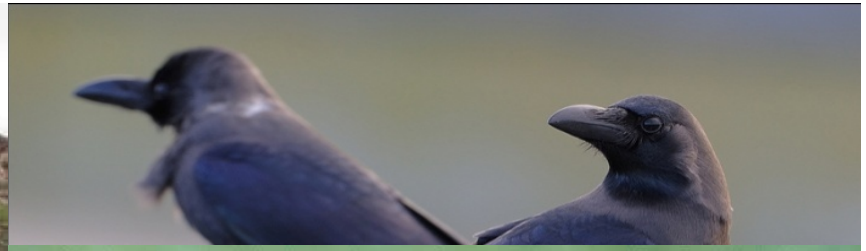
Evaluation of International Risk Assessment Protocols for Exotic Species

ICAIS 30 August 2010

Laura Verbrugge
Rob Leuven
Gerard van der Velde
Wiebe Lammers (TIE)

Radboud Universiteit Nijmegen




© Marcel van der Tol

Exotic species management in NL

- TIE (Invasive Alien Species Team)
  - Advisory commission for the Ministry of Agriculture, Nature and Food Safety
- Carry out risk analyses for exotic species and make recommendations on the necessity of prevention, control or management of exotic species
  - gobies; crayfish; house crow; common ragweed
  - Need for a standard risk assessment procedure
- Aim: give recommendations for a standard risk assessment protocol for the Netherlands

Methods

- Evaluation criteria
  - Scope and completeness, data requirements, scoring methods, uncertainties, policy compliance, user friendliness and assessment time
- Strength and weakness analysis
- Analysis effect assessment criteria
  - Ecological, economic and human health endpoints
  - What qualifies as a significant, detrimental effect?
- Comparison risk assessment classifications

Risk assessment protocols

Characteristics protocols

	BE	UK	DE/AT	IE	CH	AU/NZ	US/CA/MX
Year	2007	2005	2010	2006	2005	2008	2009
Generic	x	x	x	x			
Taxon specific					plants	vertebrates	aquatic
Scope							
Ecological	x	x	x	x	x	x	x
Economic		x		x	x	x	x
Human health		x		x	x	x	
Social		x				x	x
Approach							
Scoring	x			x		x	
Cut-off treshold	x			x		x	
Qualitative		x	x		x		x
Risk classification							
Listing system	x		x		x		
High to low		x		x		x	x

- ‘One out, all out’ principle

Assessment criteria

- Negative impacts only
- Ecological effects
  - No clear strategy on determination harmful impacts
  - Common features: species interactions and traits
  - Little to no explanation or quantification of significant harmful effects

Comparison end scores (1)

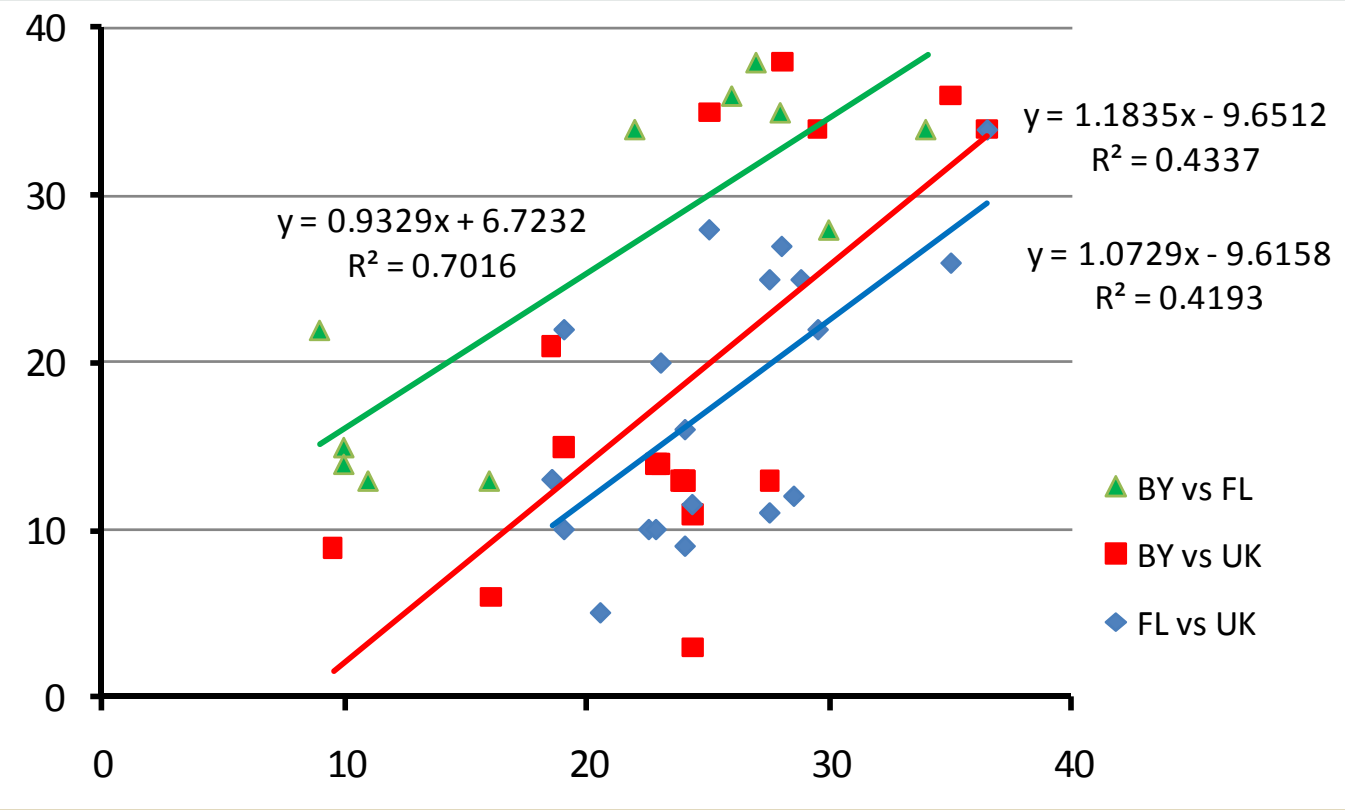
	BE[1]	DE[2]	AT[2]	UK	IE[5]	CH[6]	AU	
Fish								
Ameiurus nebulosus	Watch list	Black management list	Grey operation list	High risk[4]	Medium risk	n.a.	n.a.	NC
Gambusia holbrooki	n.r.	Grey observation list	Grey observation list	High risk[4]	Medium risk	n.a.	n.a.	RC
Lepomis gibbosus	Watch list	Grey operation list	Grey operation list	High risk[4]	n.r.	n.a.	n.a.	RC
Micropterus salmoides	n.r.	White list	White list	Medium risk[4]	Medium risk	n.a.	n.a.	NC
Neogobius melanostomus	Alert list	Black management list	Black management list	High risk[4]	Medium risk	n.a.	n.a.	RC
Pseudorasbora parva	Black list	Grey operation list	Grey operation list	High risk[3]	High risk	n.a.	n.a.	RC
Perccottus glenii	Alert list	Black warning list	Black warning list	High risk[4]	n.r.	n.a.	n.a.	C
Salvelinus fontinalis	n.r.	Grey operation list	Black management list	Medium risk[4]	Medium risk			RC
Umbra pygmaea	Not invasive	White list	White list	High risk[4]	n.r.	n.a.	n.a.	NC

1:Harmonia Database (2010), 2: Essl et al (2010), 3: NNSS (2010), 4: Copp et al (2009), 5: Invasive Species Ireland (2007), 6: CPS/SKEW (2008), 7: VPC (2007), n.a. not applicable, n.r. not reviewed.

- Comparison risk classifications plants, fish, birds, mammals
- 20 out of 29 species (64%) similar risk classifications

Comparison end scores (2)

- FISK: Freshwater Fish Invasiveness Scoring Kit



The outcome of risk assessments of exotic fish species with FISK performed by the assessors from UK, Belgium (FL, Flanders) and Belarus (BY). Scores can range from −11 to 54 and they classify non-native species into low-, medium-, and high-risk categories (High risk and invasive: ≥ 19, 1 ≤ Medium risk < 19, Low risk: < 1). Data: Copp et al. (2009), Mastitsky et al. (2010) and Verreycken et al. (2009).

Conclusions (1)

- Variety of regional, national and international risk assessment protocols
- Number and detail of assessment criteria differ widely
- Little explanation of what actually qualifies as a significant harmful effect

Conclusions (2)

- Different risk classifications due to differences in species-climate match, scoring approach, data availability, experience and number of assessors
- When using cut-off thresholds to determine the final risk classification, small changes can lead to different risk classifications (i.e., ISEIA and Ireland Risk Assessment)

Discussion

- Multiple stage assessment:

  Quick screening → detailed assessment
- Harmonization risk assessment tools
- Lessons learned for developing and implementing a risk assessment protocol
- Novel methods for scientific sound risk assessment of exotic species

Report

Verbrugge, L.N.H., R.S.E.W. Leuven & G. van der Velde, 2010. *Evaluation of international risk assessment protocols for exotic species.* Reports Environmental Science nr. 352. Department of Environmental Science, Faculty of Science, Radboud University Nijmegen, The Netherlands

http://www.ru.nl/environmentalscience/publications/publications/2010/

Thank you