

A Public Confession

- I was a member of a state management team that stocked many of this species into a reservoir in a southern state



Nile Perch

A Public Confession

- I stocked 200 of this species into a water garden.
 - Flooding resulted in a breach of the garden, and escapement into a storm drain that connects to the Great Lakes.



Giant Tigerfish

Status of FWS Ecological Risk Screening for Nonnative Species

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Request from Kathe: Content of My Presentation

- “Progress on rapid risk assessment work...”
- How [I] approached this risk assessment project...
- Outcomes...
- Lacey Act reform”

Scope of Problem

- No. of nonnative species in U.S. (Pimentel 2004)
 - 50,000
- No. of species considered invasive in U.S. (Corn et al. 1999)
 - 4,300
- Estimates of no. of species imported into U.S. annually
 - Up to 30,000?

Workload: Wildlife Inspections at Ports of Entry

- No. of wildlife inspectors
 - 139
- Inspection stations
 - 30
- Total Ports of Entry
 - 400
- Declared shipments of wildlife and wildlife products
 - 180,000

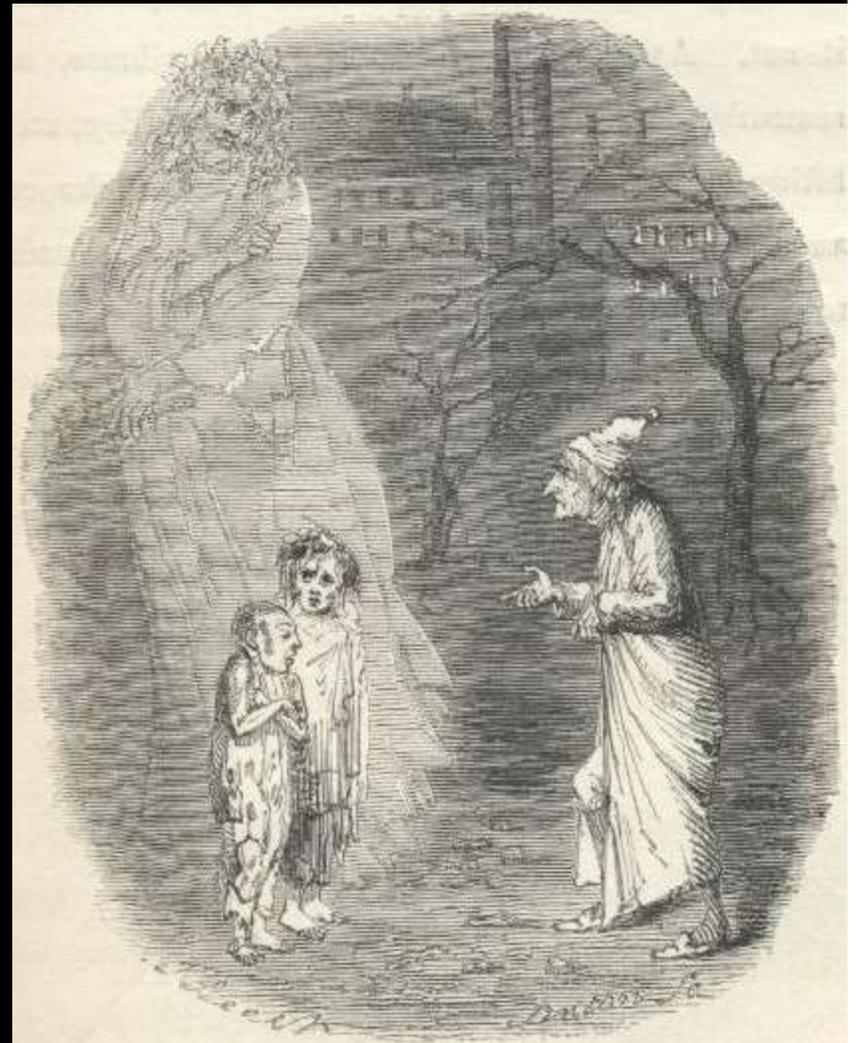
Background

- The US legally imported more than 1 billion live animals during 2005-2008
- We don't know how many animal species are being imported into the US
- Estimates of no. of species imported into U.S. annually
 - Freshwater ornamental fish - at least 4,000 species traded in world

How to Better Protect US Biosecurity?

A Christmas Carol

- Ghost of Christmas Present shows Scrooge two children that are the symbols of the children of man
 - Named “Want” and “Ignorance”
 - Of the two symbols, Ignorance symbolized the doom of man



Want and Ignorance

- **Want:**
 - Certainly those, here, **want** to prevent invasive species from:
 - Being imported, becoming established in the wild, and then
 - Impacting natural & societal resources

Want and Ignorance

- Ignorance:
 - We have mostly been ignorant about what materials we can use for:
 - Decision support (what to do and how to do it)
 - Prioritization of actions

Want and Ignorance

- Ignorance no more
 - Risk Assessment can help support informed, science-based decision making
 - It is the most tenable approach/products that can be used in structured decision making

Ghosts of FWS Regulatory Process Past and Present

- Past and present approach to nonnative species import regulation was developed by someone who believed that **eternity is not quite long enough**
- That SLOW regulatory process is how FWS implements the Lacey Act



Definitions

- **Risk Analysis:**
 - Risk Assessment + Risk Management + Risk Communication
- **Risk Assessment:**
 - Risk characterization
- **Risk Management:**
 - ...weighing [and implementing] policy alternatives
- **Risk Communication**
 - Communicating risk assessment results, and risk management actions

Presentation Overview

- Summarize Rapid Risk Analysis Process
 - With emphasis on **Ecological Rapid Risk Assessment**
- **GLRI**
- **Summary of Ecological Risk Screening Reports**
 - 8 species examples
- **Some next steps**

An [my] approach...

What is a Screening Tool?

- A screening tool
 - is a risk assessment system designed to **RAPIDLY** evaluate the invasiveness (establishment and impact) potential of a nonnative species,
 - [prior to its importation or establishment in a jurisdiction]

Outcome of Screening Risk Assessments

- Enhanced protection of US biosecurity
 - Results of risk screening can be used by:
 - Governments and industries to determine whether risk, of a nonnative species, impact on native species and ecosystems, is:
 - » Uncertain
 - » Low, or
 - » High

Risk Management: Decision Support based on Screening Risk Assessments

- **Governments** can use results to **regulate**
- **Industries** can use results to **keep “green”**
- Both groups can work together
 - Combination of **Regulatory and Non-Regulatory actions**

Outputs from Screening Risk Assessments

- Screening Report results:
 - If species impact risk is **Uncertain**, then:
 - **Yellow for caution**
 - Employ a different approach for risk assessment

Outputs from Screening Risk Assessments

- Uncertain Risk
 - Additional risk assessment
 - Approaches could include:
 - ANSTF (1996) Risk Analysis Process
 - » Time to revise this approach
 - FWS approach to risk assessment being developed
 - » New tool

Outputs from Screening Risk Assessments

- Screening Report results:
 - If species establishment and impact risk is clearly Low, then
 - Green for GO
 - The species is acceptable for importation and/or use in trade

Outputs from Screening Risk Assessments

- Screening Report results:
 - If species impact risk is clearly **High**, then:
 - **Red for Stop**
 - A decision is needed about either, or both:
 - **Voluntarily preventing/halting trade** (industry),
 - **Regulating** trade (government)

Rapid Risk Analysis Process

Vetted with MRBP and Nonnative Wildlife Screening Working Group

1. Identify Species for Screening
2. Rapid Screening Process
 - a. If risk is clearly low, then no action
 - b. If risk is clearly high, then Step 5
 - c. If risk is uncertainty, then Steps 3-4
3. Prioritize species for Detailed Risk Assessment
4. Agency Conducts Detailed Risk Assessment
5. Develop Agency Actions to Regulate and Manage
6. Implement Agency Priority Actions
7. Evaluate Agency Actions, and Adapt Management Programs

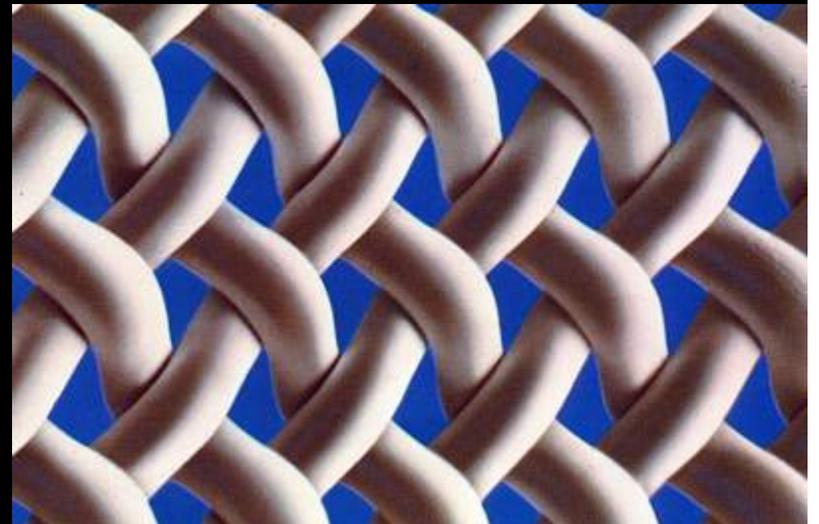
Rapid Risk Analysis Process

Bests Predictors of Species Invasion

- For a species, **best predictors of invasiveness are:**
 - History of invasiveness
 - “Climate/Habitat match:”
 - Climate match
 - Between locations where established, and
 - Target locations (e.g., US)

Summary: Screening Present and Future

- The Coarsest Screen:
 - History of Invasiveness
 - Climate Match
- More tools being used and developed
 - More complicated



FWS Approach: Screening Process

- Detailed (6 page) **SOP** used to conduct the screening
- **Information/data/outputs/synthesis packaged** in standardized format
- **QA/QC**
 - Includes supervisory and other internal peer review

Screening Report Template

- Native Range, and Status in the United States
- Biology and Ecology
- Impacts of Introductions
- Global Distribution
- Climate Matching with US
- Risk Assessment
 - Summary of Risk to the US
- High Risk Species:
 - Projections of establishment and impacts in US
 - Within habitats, and for ecosystem components,
- References

**FWS Screening Results:
8 Species**

Summary of Ecological Risk Screening Report: Stone Moroko



Stone Moroko

- History of Invasiveness
 - Coarsest screen:
 - Presently, **Europe's most invasive fish**



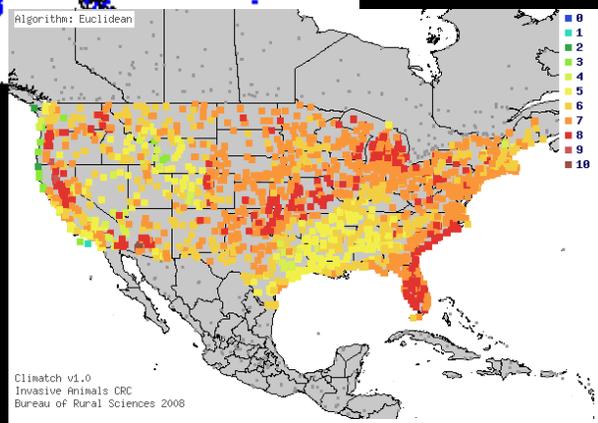
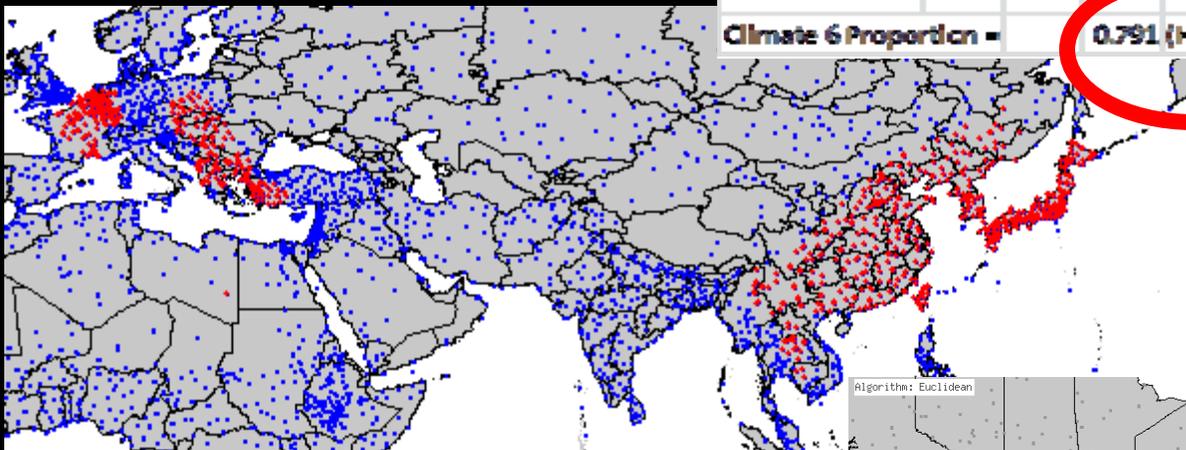
Stone Moroko: Selection from Screening Report

- Impact outcomes
 - Altered trophic level
 - Changed gene pool/ selective loss of genotypes [of species impacted by *P. parva*]
 - Damaged ecosystem services
 - Ecosystem change/ habitat alteration
 - Negatively impacts aquaculture/fisheries
 - Negatively impacts cultural/traditional practices
 - Reduced [ecosystem] amenity values
 - Reduced native biodiversity
 - Threat to/ loss of endangered species
 - Threat to/ loss of native species...

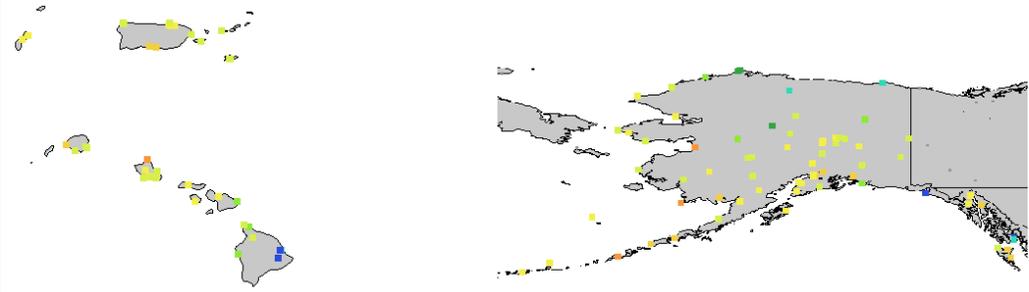
Stone Moroko: Climate Matching

CUMATCH Score	0	1	2	3	4	5	6	7	8	9	10
Count	5	5	8	24	94	205	510	868	279	5	3
Climate 6 Proportion =											

0.791 (High)



Climatch v1.0
Invasive Animals CRC
Bureau of Rural Sciences 2008



Stone Moroko

- Risk Assessment Elements
 - History of Invasiveness: High
 - Climate Match: High
 - Overall Risk Assessment Category: High
 - Certainty of Assessment: High



Crucian Carp, Prussian Carp, Roach, Wels Catfish

- Risk Assessment Elements

- History of Invasiveness: High

- Climate Match: High

- Overall Risk Assessment Category: High

- Certainty of Assessment: High

Roach



Crucian carp



Prussian carp

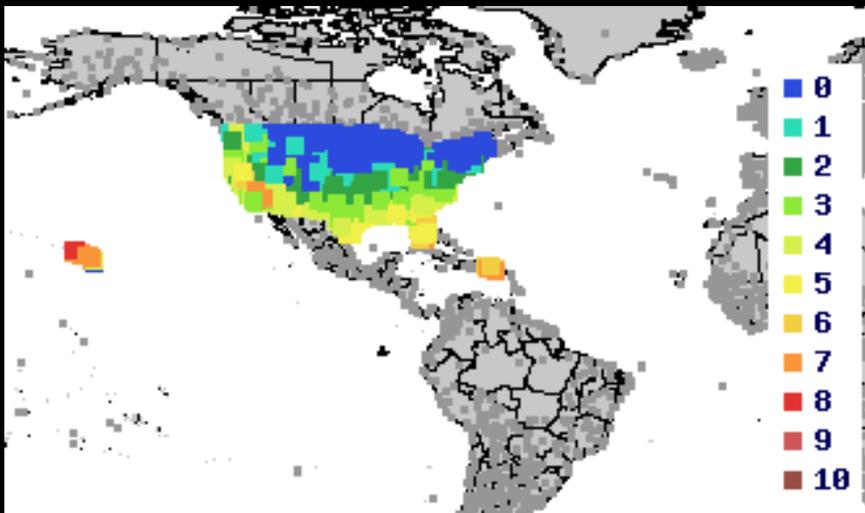


Wels Catfish



Nile Perch

- Assessment Elements
 - History of Invasiveness: High
 - Climate Match: Medium, for U.S. and Territories
 - But High in southeastern, southwestern, and western continental states, and Hawaii, Guam, and Puerto Rico
 - Overall Risk Assessment Category: High
 - Certainty of Assessment: High



Great Lakes Restoration Initiative

- I have received funding for conducting rapid screening to support regulatory and non-regulatory decision making
 - Last two years, assigned list of 1,400 species for screening to staff
 - About 850 completed in DRAFT form
 - Screening reports will be posted online
 - FWS website
 - Comments on reports enabled

What to do?
Species Assessed as **Uncertain Risk**
Based on Screening

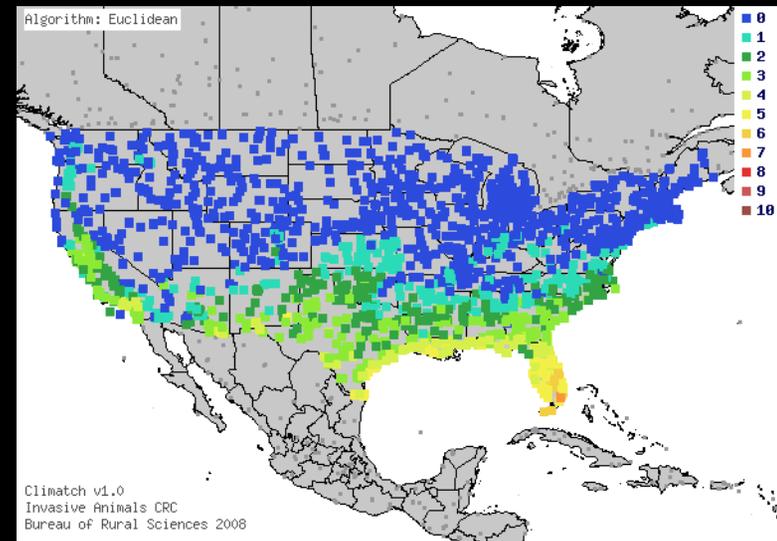
Uncertain Risk

- Risk is uncertain when:
 - Species has not been introduced/established outside native range, &/or
 - Paucity of data/information about the species
 - Scientific impact assessments have not conducted, &/or results equivocal

Uncertain Risk Species: Next Steps

- **Advanced Risk Assessment Process** being developed to characterize risk
 - For potential use in decision support

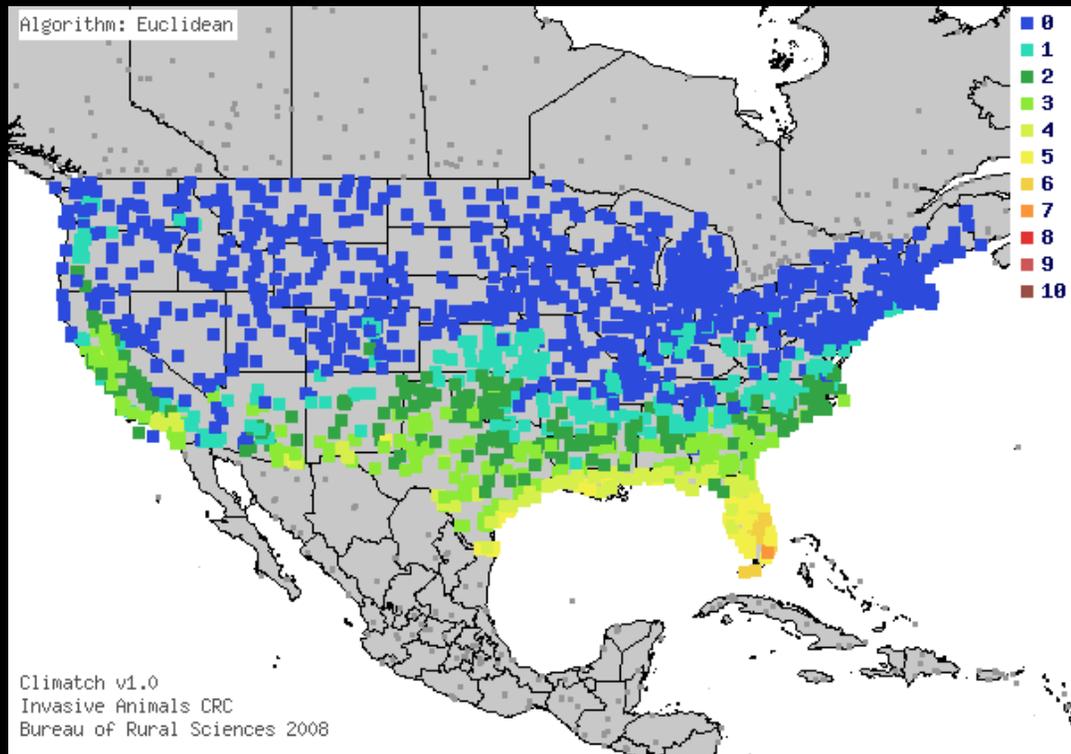
Giant Tigerfish



CLIMATCH Score	0	1	2	3	4	5	6	7	8	9	10
Count	1028	271	233	229	132	62	15	4	0	0	0
Climate 6 Proportion =	0.010 (Medium)										

Uncertain Risk Species: Next Steps

- **Non-regulatory risk management** being explored
 - Keep species out of: US, or at least areas with high climate match, and their connections (e.g., river systems)



CLIMATCH Score	0	1	2	3	4	5	6	7	8	9	10
Count	1028	271	233	229	132	62	15	4	0	0	0
Climate 6 Proportion =	0.010 (Medium)										

Uncertain Risk

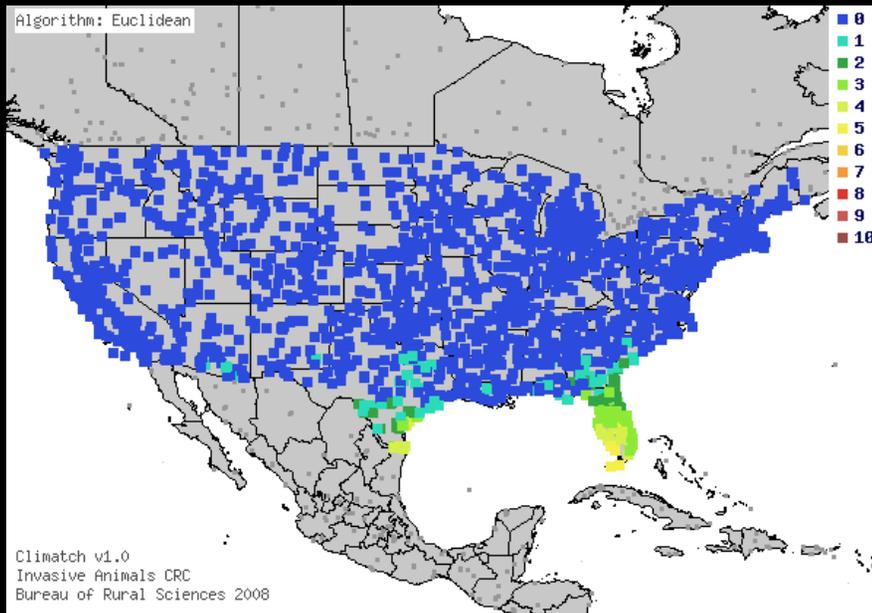
- Additional tool being developed
- Additional data (beyond scientific literature and databases) being acquired
- Will help to characterize risk

Low Risk Species

Betta (*Betta splendens*)

Risk Assessment

- History of Invasiveness: **Low**
 - No impacts documented.
- Climate Match: **Low (0.00 - Lowest possible)**
- Overall Risk Assessment Category: **Low**
 - Certainty of Assessment: **High**



Want and Ignorance

- If we **Want** to participate in regulatory and non-regulatory actions to protect the biosecurity of the US
- Then, we are not **Ignorant** about tools that can support decision making on species within several pathways



Next Steps

Decision Support: Risk Screening Reports

- **Ecological Risk Screening Summaries** (High, Low, Uncertain Risk) will be:
 - Used during **FWS decision making** re: Lacey Act
 - **Posted on the WWW** so State and industry partners can also use information to:
 - Advance **regulatory and self-regulatory approaches**
- Intended to help promote sustainable commerce



Non-regulatory Approach: Partnership with Industry and AFWA?

- Part of comprehensive biosecurity
- FWS working on a draft MOU with PIJAC
- Hope a final MOU is agreed upon, in partnership with other industry groups & AFWA



Greenwire
THE LEADER IN ENERGY & ENVIRONMENTAL POLICY NEWS

An E&E Publishing Service

INVASIVE SPECIES: FWS reaches out to old adversary in bid to build trade barriers *(Wednesday, March 28, 2012)*
Allison Winter, E&E reporter
The Fish and Wildlife Service is embarking on an effort to try to keep new invasive animals out of the United States.

**Risk Screening:
A 50-foot, 38-ton gorilla
for decision support**

to manage risk of imported species becoming
established and impacting the U.S

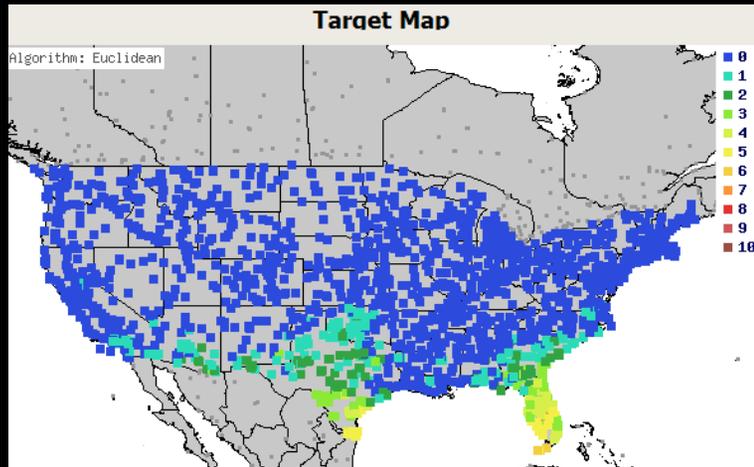


For more information

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Questions and Discussion

Uncertain Risk Species: Swai (*Pangasianodon hypophthalmus*)



Climate Match=0.002
(very low)



Language: **English** Chinese

International Introductions of *Pangasianodon hypophthalmus* Introductions as compiled by FAO

Main Ref:	Barua, S.P., M.M.H. Khan and A.H.M. Ali Reza 2001
To:	Bangladesh
FAO area:	Asia - Inland waters
From:	Thailand
FAO area:	Asia - Inland waters
Year:	1990
Range:	-
Period:	1975-1999
Established in the wild:	established, natural reproduction
Established in aquaculture:	-
Significant ecological interactions:	probably some - adverse
Significant socio-economic effects:	unknown -
Introduced by:	
Reason:	unknown
Other reason:	
Comments:	One of the most 'disastrous' alien invasive species brought to the country. Ref: Barua, S.P., M.M.H. Khan and A.H.M. Ali Reza, 2001