Fish and Wildlife Service Update

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Midwest Region

Overview

- Risk Assessment
  - OMB Peer Review for Influential Science
    - Risk Assessment Tools
      - Ecological Risk Screening
      - Bayesian Network
      - Risk Assessment Mapping Program
- Risk Management
  - Regulatory
    - Proposed Rule – 11 species
  - Non-Regulatory
    - MOU with PIJAC, AFWA, others
  - Habitattitude
- Binational and Continental Coordination and Cooperation on Risk Assessment

Risk Assessment

- OMB Peer Review for "Influential Science"
  - Peer Review Completed for
    - Risk Assessment Tools
      - Ecological Risk Screening
      - Bayesian Network Model
  - Peer Review nearly completed for Risk Assessment Mapping Program (RAMP)
    - Matches climate niche for most species
      - Uses information on source locations from GBIF
      - Under present climate and future conditions

Ecological Risk Screening Results for 3 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…
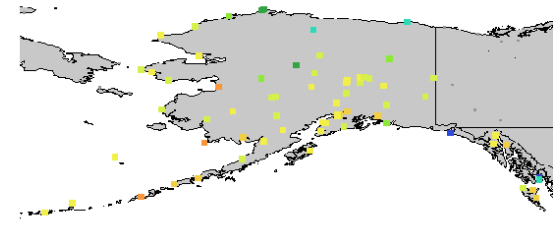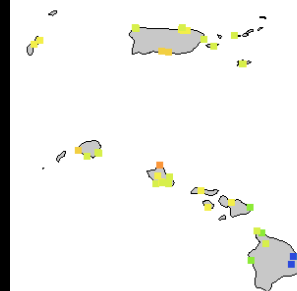
Stone Moroko: Climate Matching

CLIMATCH Score	0	1	2	3	4	5	6	7	8	9	10
Count	5	5	8	24	94	305	510	868	279	5	3
Climate 6 Proportion =			0.791 (High)								
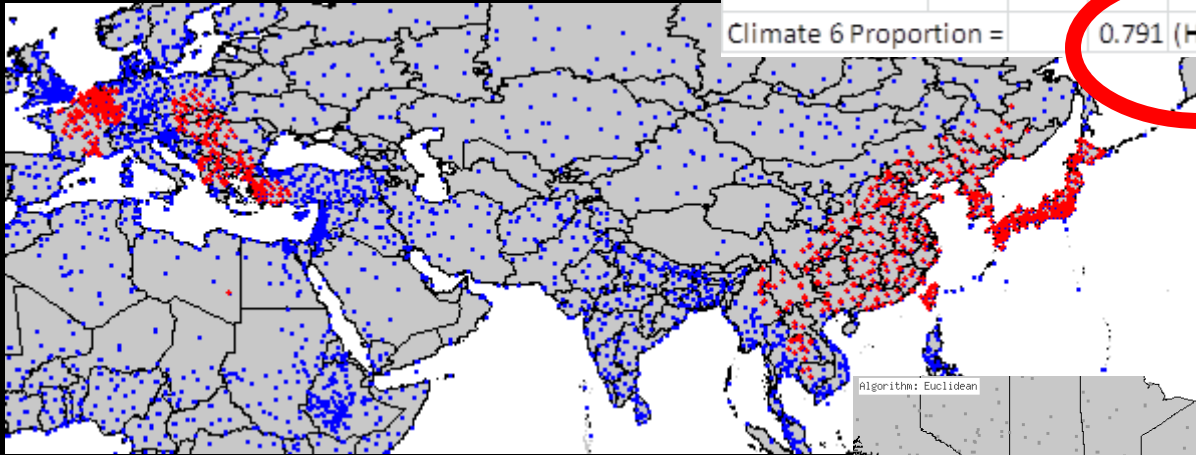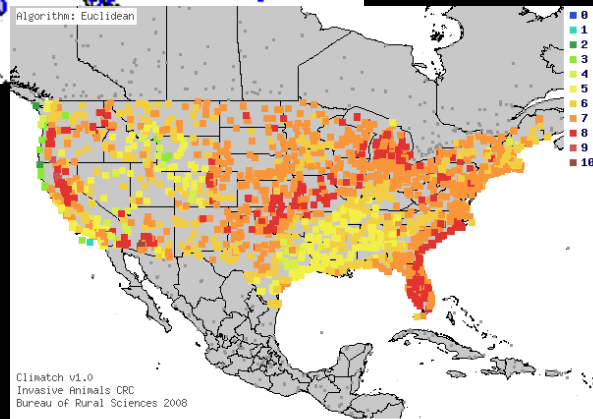
# Ecological Risk Screening Summary: Stone Moroko

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

Ecological Risk Screening Summary:
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
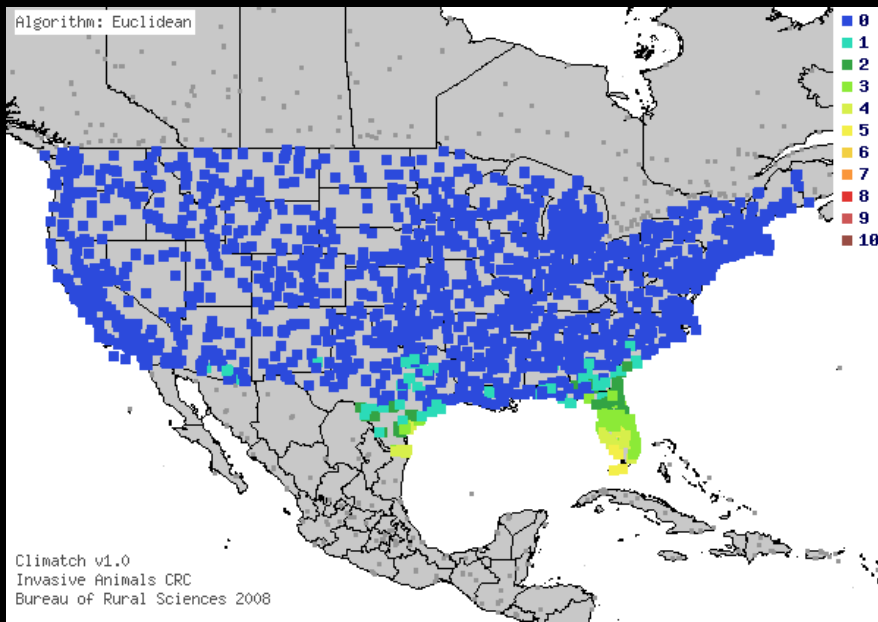
Uncertain Risk

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

Uncertain Risk Species:
Next Steps

- **Advanced Risk Assessment Process** been developed to characterize risk

    - For potential use in decision support

- Additional data (beyond scientific literature and databases) being acquired

- Will help to characterize risk

Giant Tigerfish

Great Lakes Restoration Initiative

- Ecological Risk Screening Summaries (AKA Risk Assessments)
  - 2000 completed in draft form
  - New Website to be developed soon
  - Draft ERSSs will be posted
    - All 2000 will not be available for some time
    - ~200 to be posted during the next year
    - Will include public comment opportunity
    - If you have a species for which you are seeking risk assessment products, then contact me.

Bayesian Network:
When Ecological Risk Screening Characterizes Risk as Uncertain
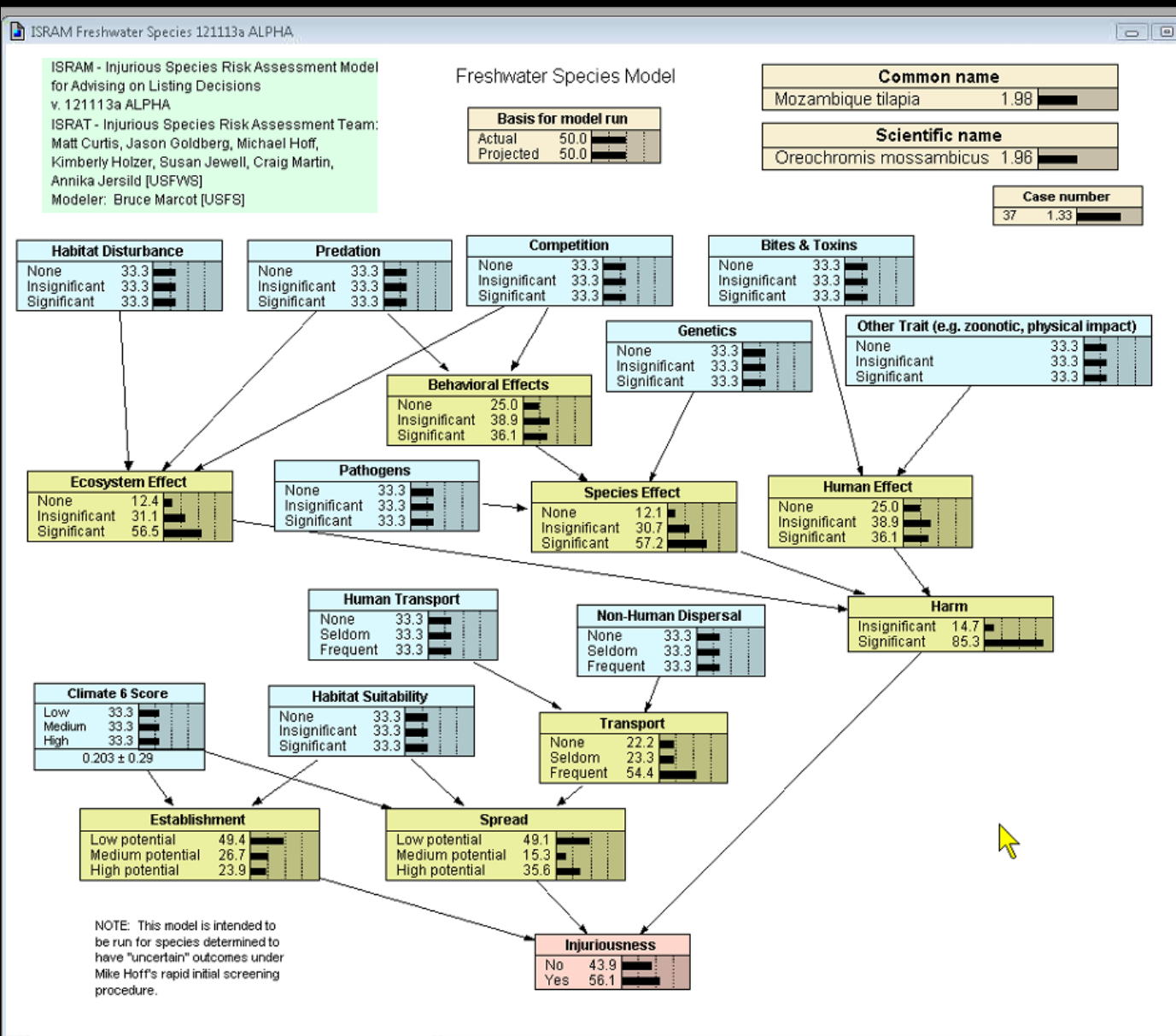
Risk Assessment Mapping Program: Tool For Climate Matching

- Developed by FWS

- Has undergone OMB Peer Review for Influential Science

  - Peer reviewers included a team from (CONABIO) Mexico, and GIS and risk assessment experts from the U.S.

  - The peer review is almost complete.

    - Reviewers found no major problems with RAMP, so we are beginning to use it for various applications

Purpose of RAMP

- RAMP was constructed to allow projected climate niche in the U.S. and North America, of any species, under present future climate conditions
  - RAMP can be made available
  - Peer reviewers wish to see RAMP readily available online, so we are evaluating the best approach for serving RAMP online

RAMP Methods

- RAMP Uses:
  - Weather data (16 climate variables available from Worldwide dataset)
    - Use of these data for climate niche modeling was previously peer reviewed, and used by the Australian government
  - Latest IPCC Representative Concentration Pathways (RCPs) to model climate niche
- Models climate niche presently, and in two future generations
 - Future Generations = at years 2050 and 2070

RAMP Methods

- RAMP matches weather data for:
  - Source locations for each species (using data available in GBIF.org)
  - Target locations
    - North America
    - Each North American Nation, or
    - Great Lakes Basin

Interpretation of RAMP Maps

- RAMP maps show climate niche match, using colors.
  - Warmer colors (orange, red, brown) depict highest climate niche match (see graph legends showing colors for Scores 6-10)
  - Yellow (legend Score 5) depicts marginal climate niche match
  - Cool colors (legend scores 0-4) depict low match of climate niche
- Climate Match Score tabulated

RAMP Climate match for Hydrilla verticillata:
2050 and 2070 under a range of Scenarios

Current Climate Match

2050 RCP 2.5

2050 RCP 4.5

2050 RCP 8.5

2070 RCP 2.5

2070 RCP 4.5

2070 RCP 8.5
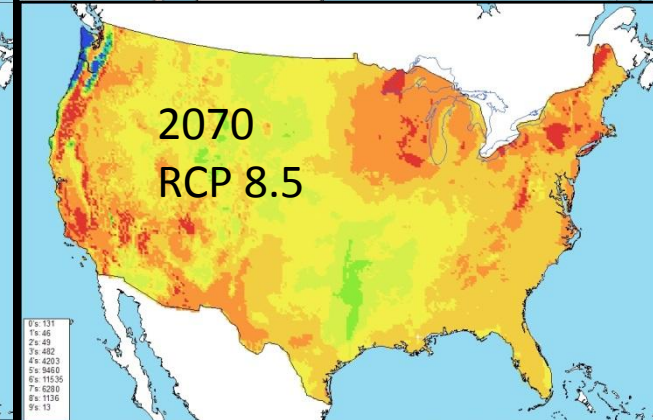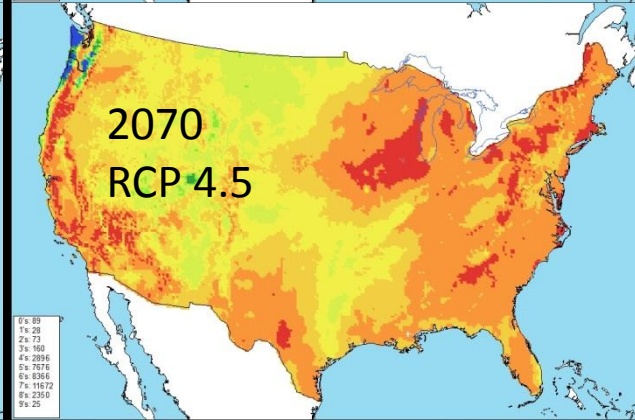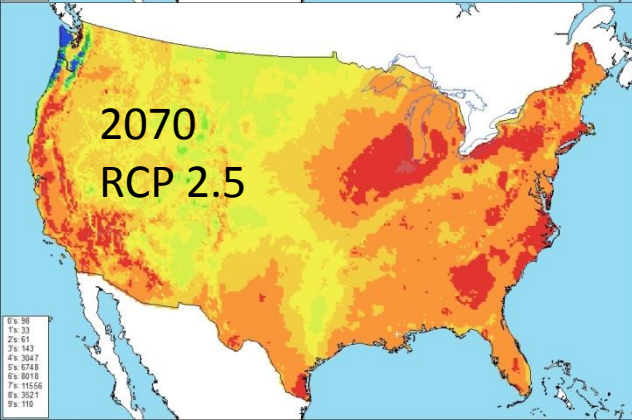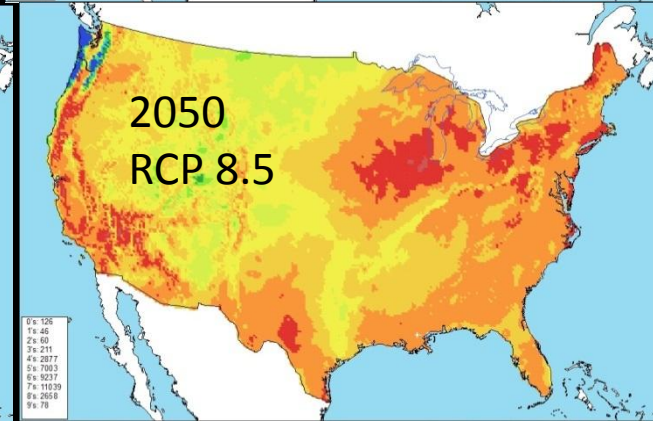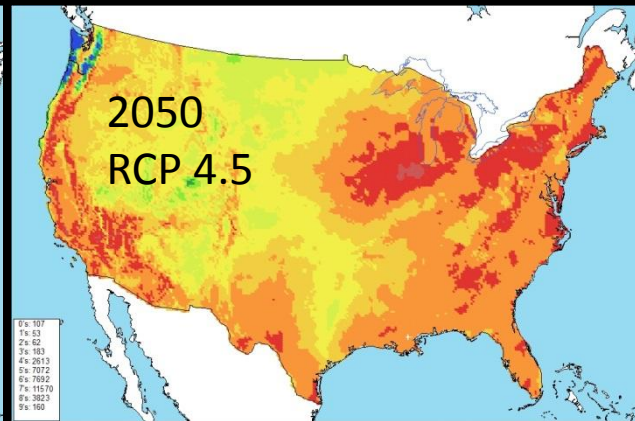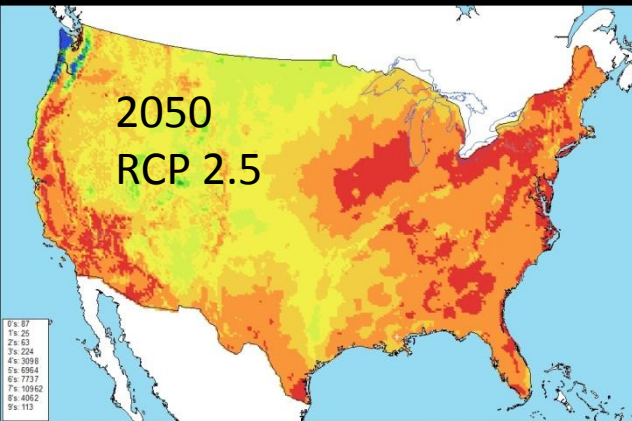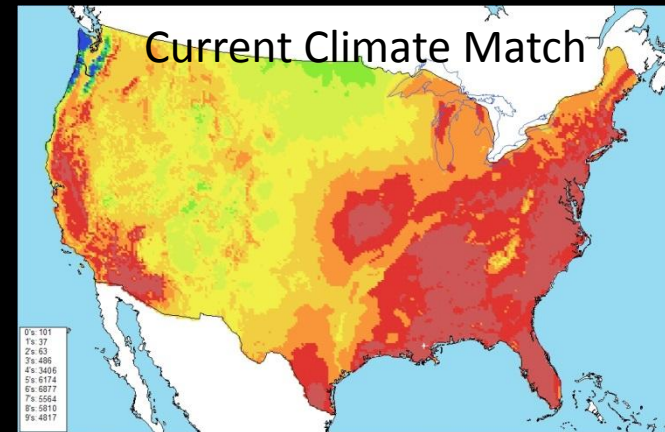
Risk Management Decision Support:
Risk Screening Reports and Bayes Net

- Outputs will be:
  - Used during FWS decision making re: Lacey Act
  - ERSSs Posted on the WWW so State and industry partners can also use information to:
    - Advance:
      - Regulatory approaches
      - Non-regulatory approached intended to help promote sustainable commerce

Risk Management

- **Regulatory**
  - Proposed rule to list 11 species as Injurious (Lacey Act)
    - Final stages of preparation
    - Species NOT currently in trade in US

Risk Management

- Non-Regulatory
  - Implementation of MOU with PIJAC and AFWA
    - List of 5 species, NOT in trade, provisionally assessed as high risk, provided to partners
      - Next steps
        » Additional queries to determine trade status
        » FWS provides risk assessment materials to partners

Great Lakes Water Quality Agreement

- AIS Subcommittee
  - Co-chaired by FWS & DFO
    - Task Teams
      - Early Detection
      - Rapid Response
      - Species Risk Assessment
        » Coordinate risk assessments on ~ 30 species
      - Pathway Risk Analysis
        » Illegal Trade Pathway

Trilateral Committee for Wildlife and Ecosystem Restoration and Management

- 19th Annual meeting of Trilateral (CA, US, MX), in MX, May 2014
  - Executive Committee Approved
    - Sharing, among Federal agencies, of nonnative species risk analysis tools
    - Coordination of risk analyses activities
    - I am leading

Habitattitude

- Habitattitude campaign being improved
  - Structure
    - Steering Committee
      - Advisory Committee
      - Implementation Committee
      - Website Committee
  - Function and Result
    - Front-end messaging
    - Change/evaluate human behavior

Great Lakes Restoration Initiative

- Tool Development/Registration
  - Bigheaded carps control
    - USGS development of microparticles
    - FWS Registration of that technology
    - USACE and State Agencies are potential applicators
  - Bigheaded carps (& other fishes) containment
    - USGS development of:
      - CO_2 deterrent system
      - Watergun
    - FWS Registration of those systems
    - USACE and State Agencies are potential applicators