Federal Policy on Forest Invasive Species and its Relationship to Evolutionary Biology Research

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Topics

- Federal Policy for Forest Invasives
- US Forest Service Invasive Species Management Plan
- Science-Policy Interface: Values and processes
- Opportunities for more effective interaction
Federal Management Plan for Invasive Species

- Clinton Executive Order (1999)
- National Invasive Species Council formed
- 12 Federal Departments
- Co-chaired by Departments of Interior, Agriculture, and Commerce
- Developed National Plan
Forest Service Invasive Species Management Plan

1. Prevention
2. Eradication
3. Control and Management
4. Restoration
5. Research and Development
1. Prevention

- Risk assessments: e.g. exoticforestpests.org
- Offshore pre-clearance of shipments (APHIS)
- Asian gypsy moth Russian/Japanese port monitoring
- International exchanges of expertise
2. Eradication

- New Pest Advisory Group
- Early Detection/Rapid Response
- Cooperation among Federal/State agencies
- Eradication of new invaders (Asian longhorned beetle in Chicago, gypsy moth in west)
3. Control and Management

- Long-term pest-specific strategies
- Slow-the-Spread Gypsy Moth, SOD, EAB
- Leafy spurge- spotted knapweed, other entrenched invasive plants, noxious weeds
- Forest Health Program: 800,000 acres/year treated
4. Restoration

- White Pine Blister Rust: genetic resistance breeding and planting
- American Chestnut: genetic resistance breeding and planting
- Native grass plantings
- Urban replanting after ALB, EAB
5. Research and Development

- Ongoing efforts for new invaders
- EAB, SOD, Sirex, Plants, Gypsy Moth
- Detection techniques (pheromones, lures)
- Control methods
- Biology
- Biocontrol
- Remote sensing
FS Genetics Program: Management and R&D

- Long-term history of forest tree breeding and research
- Genetic variation studies - most major conifers
- Common-garden studies, molecular studies on genetic variation/architecture
- Breeding purposes/seed transfer rules
- Operational breeding efforts: Douglas-fir, white pines, loblolly pine
FS Policy on Insects/Pathogens

- Prevention- Pathway approach: solid wood-packing material, treatment required, major pathway
- APHIS has lead on new invaders: regulatory role
- FS has support role: non-regulatory
- Eradicate if New Pest Advisory Group recommends it
- Quarantine possible: APHIS
- Mgmt program possible: APHIS and FS, States
- FS, States ‘inherits’ pests in long-term: Dutch-elm disease, chestnut blight, etc.
USDA Policy on Invasive Plants

- FS controls ‘noxious weeds’ on NFS lands
- FS eradicates new invaders when possible
- FS manages existing problem plant pests
-APHIS policy on importation of “Plants for Planting”: Q-37 regulations
- Currently use ‘black list’- limited list of bad actors
- Proposed ‘good list’ (i.e., after a risk assessment, added to list)-(but ‘grandfather’ rule applies)
- “Clean Stock” approach: approve entire nursery operation
- Many partners involved in formulation of policy
Science/Policy Interface: Values and Processes

- Policy: Anything the government does/spends money on
- Policy
  - “Real policy”- in the manual/handbook
  - Programs
  - Decisions
- Funding allocations
Science/Policy Interface: Values and Processes

Science environment:
- Values experimentation, innovation, basic over applied research
- Risk acceptance: high
- Processes: peer review
- Rate of change: new information acquired quickly, paradigms change more slowly
- Driven by: previous research, curiosity, funding

Policy environment:
- Values stability, human-interface topics (health, security, commerce, etc.)
- Risk acceptance: low
- Processes: Institutional chains of command
- Rate of change: slow, but responsive to ‘crises’
- Driven by: (invasives) crises, politics (Federal administration)
Policy environment: Highest values (what people care about)

- Human health: diseases, pollution
- Economically important systems (e.g., food crops)
- Environmental services: carbon, water, T&E species
- Homeland Security
1) **Invasiveness**: spread rate potentials (dispersal mechanisms/rates, life cycle, climatic limits, colonizing ability). Most of the talks today are basic research that drive ‘invasiveness’.

Studies on genetic variation, hybridization, adaptation, founder effects—leading to why/how this species becomes an invader.

2) **Locations**: current and future geographic locations of invasive species. Especially helpful are studies that predict which environments will be invaded.

3) **Pathways**: how does it get here? Anthropogenic factors. Controls for import/export; disposal techniques, etc. Crucial for management programs.

4) **Management**: how do we better detect, prevent, (bio?)control, mitigate? This research is more applied; research presented at this conference is more basic.
Science-Policy Interface

Basic Research is:

- Incomplete (addressing small component of the bigger management issue)
- Not directly applicable (e.g., temporal/spatial scale)
- May apply to a species or system that management has little interest in, but could serve as a model for one of interest.
Basic Research
Hybridization
Founders effects
Genetic variation
Adaptation

Applied Research
Invasion Potential
Reproductive Rates
Invasion Predictions

Policy
Programs For Control

Funding

Policy development:
Current climate

- Increasingly strict scrutiny of priorities
- Priorities must be defended/explained: which species to spend money on
- ‘High value’ systems are top priority for policy makers
- Much less funding available for anything not considered ‘directly applied’
- R&D proposals can be positioned to link better with applied needs
Science-Policy Interface: Opportunities for more effective interaction

- More fora (like this one!) to address topics such as:
  - Paradigm shifts in biology: how does this affect invasives research (e.g., rate of evolutionary change)
  - How can funding programs (i.e., NSF, NIH, USDA, etc.) interact more effectively to yield valuable ‘applied’ information more quickly
  - How to use the limited research funding more effectively (target species? Mechanisms? More international research?)
- Involving scientists more effectively in policy development and review processes (?)
- Your ideas?