

EXAMPLES OF CONTEMPORARY TOPICS

Forestry, Wildlife and Fisheries

Forestry

1. Do widespread silvicultural practices in temperate regions have an impact on climate?
2. Advantages and disadvantages of using trees vs. grass for biofuel production
3. Effects of nitrogen deposition on forested ecosystems
4. How does increasing carbon dioxide affect forest productivity?
5. Interest in locally grown produce is increasing. Can we get the public to be equally excited about locally grown wood?
6. Challenges of controlling invasive species in forests
7. Feasibility of measuring individual trees using remote sensing
8. Representative natural disturbance regimes as templates for the selection and scheduling of appropriate silvicultural treatments. (A hot topic in Canada, discussed in a keynote presentation by Kimmins at the October 2007 SAF Convention).
9. Should forest/logging roads be considered point or non-point sources for stormwater runoff?
10. Forest certification: is it a viable option?
11. What are the benefits of wood-fired power plants?
12. The future of forestry: is it a dying profession?
13. Integrated forestry land use systems (agroforestry, silvopasture): challenges and benefits.
14. Forested ecosystems in the urban environment: challenges and benefits
15. Is forest certification having biologically meaningful impacts on forests?
16. Can planting and other silvicultural practices be used to address shifts in the dynamics and ranges of native trees brought about by climate change?
17. What are the impacts of introducing genetically modified trees into forests on ecological processes and animal species?
18. What is the potential for ecosystem service markets in Tennessee and how might they affect forest management?
19. What options are available to encourage the new population of private landowners to actively manage their forests?
20. What are the differences between forests and grasslands at the level of watersheds?
21. Considering various forms of invasive species, urbanization, and climate change, what will Tennessee ecosystems look like in 50 years?

22. Considering the limited funding for eradicating exotic species, or at least slowing their spread, should we even try? Are there more effective uses of funds, time and energy for addressing exotic invasions?
23. What are the ecosystem impacts of wild pigs?
24. Is there a difference between “on-the-ground” restoration and academic studies of restoration?
25. What are “high quality” hardwood seedlings?
26. Is facilitated migration a good management option for dealing with climate change effects?

Center for Renewable Carbon

- 1) Life cycle analysis as a tool for bioenergy/biorefinery evaluation
- 2) What is the best bioenergy crop for the US to pursue?
- 3) The impact of bioproducts on biorefinery economics
- 4) Energy balances for EtOH production
- 5) Is BuOH a better long term biofuel than EtOH? Process, economics, impact
- 6) Possible impacts of large-scale bioenergy crop development on wildlife and fisheries habitat
- 7) Top technologies for biomass conversion
- 8) Chemical catalysis in the conversion of renewables to bioproducts
- 9) Nanotechnology in the biorefinery - products, processes, catalysts
- 10) Process models for bio-based manufacturing systems
- 11) New crop/plant opportunities for bioenergy (i. e., what's out there besides switchgrass or wood?)
- 12) The role of wood in 'green' building programs
- 13) Competition for supplies of woody biomass; the potential for competition between new and existing users of wood residues
- 14) Comparisons of building materials using life-cycle analysis
- 15) Inefficiency of ethanol production from plant biomass (e.g., David Pimentel's research, Cornell)
- 16) Components of variance of biofuel quality
- 17) Data quality assessment methods for bio-based products research
- 18) Manufacturing and characterization of wood-based composites
- 19) Development of biobased products
- 20) Mechanical properties of cell wall
- 21) Advanced materials from natural resources

- 22) Impact of physical and chemical modification on wood
- 23) Nano mechanics of bio materials
- 24) High-through put analytical methods for biomass characterization
- 25) New developments in lignin characterization and use
- 26) New biopolymers
- 27) Alternatives to formaldehyde based adhesives
- 28) Advanced pretreatment in the biorefinery
- 29) Pyrolysis as an interface between the biorefinery and the petrochemical industry
- 30) Genetic design of plants optimized as sources of biofuels or biobased chemicals

Wildlife

- 1) Environmental (or wildlife) impacts of hydraulic fracturing (i.e., fracking).
- 2) The impact of feral animals on native wildlife
- 3) The impact of biofuels production on wildlife populations
- 4) The impact of increasing urbanization/fragmentation on wildlife populations
- 5) The impact of increasing hunt leases, hunt lease prices, absentee landowners, and land ownership patterns on the future of hunting
- 6) The impact of political ploys and litigation to stymie forest management on forest health and associated wildlife populations
- 7) The impact of fire suppression on early successional plant and wildlife communities
- 8) Implications of herbaceous biofuel feedstock production on wildlife and ecosystem sustainability
- 9) Management of the wildlife rabies epidemic on the eastern seaboard
- 10) Herbivory as a tool for oak savannah restoration, the role of domestic livestock
- 11) Landscape-level effects on forest breeding birds in extensively forested ecosystems
- 12) Bayesian vs frequentist approaches to modeling/statistics
- 13) What is adaptive harvest management?
- 14) Restoration ecology versus reintroduction of individual species (e.g., Conservation Biology 21: 1387-1310).
- 15) Effects of surface mining on wildlife species
- 16) Hypotheses for the emergence of zoonotic pathogens (or pick a specific pathogen)

- 17) Evidence of the effects of global climate change on wildlife species (e.g., what's going to happen to the polar bear?)
- 18) The effects of ozone depletion on wildlife
- 19) Should the wildlife profession support game ranching?
- 20) Differences in wildlife management between the United States and Europe
- 21) Challenges to managing for biodiversity
- 22) The commercial value of game and non-game wildlife
- 23) Habitat Conservation Plans for endangered species – what are their shortcomings?
- 24) History of Measuring Wildlife Habitat Quality – what is our current state of understanding?
- 25) Population Viability Analyses – examples and shortcomings
- 26) Chaos Theory – does chaos exist in wild populations?
- 27) Use of Null Models in Ecology – examples and shortcomings
- 28) Adaptive plasticity – how do animals cope with a changing environment?
- 29) Quantifying state of restoration in ecosystems
- 30) Estimating carrying capacity of wetlands
- 31) Do wildlife serve as spill-over reservoirs of zoonotic pathogens?
- 32) OIE listing of reportable amphibian diseases. What are the implications, what are the reasons for the listings, and what are the challenges to manage these on a global scale.
- 33) AIC modeling: advantages and shortcomings
- 34) The illegal wildlife trade. Why does it still occur, who is doing it, who is contributing to the problem, can we ever stop it?
- 35) Endocrine disruptors and wildlife populations, is there a concern?
- 36) What factors are contributing to the decline in turtle populations
- 37) Setting waterfowl season limits according to Adaptive Harvest Management
- 38) Effectiveness of point restrictions in Quality Deer Management
- 39) The controversy of wildlife trapping
- 40) The controversy of hunting wildlife with dogs
- 41) Wildlife Biologist Certification: should it be required?
- 42) Health and safety requirements for conducting fieldwork - are we going to lose fieldwork?
- 43) Use of stable isotopes in wildlife conservation or ecological studies.

- 44) Do disease concerns override the benefits of wildlife translocations?
- 45) What is radar ornithology and what have we learned from it about bird migration
- 46) The effects of white-nose syndrome on bat populations
- 47) Potential for adaptive fetal sex ratios in ungulates
- 48) Does harvest strategy artificially alter the size and quality of deer in the population
- 49) Can vaccination of wildlife hosts help reduce vector-borne disease?
- 50) Using prescribed fire in upland hardwoods, both from a forest management and a wildlife management perspective
- 51) Effect of fire frequency and season burning in restoration ecology
- 52) Using the seed bank to enhance early successional habitat
- 53) Using age restrictions in quality deer management
- 54) Environmental toxins of concern to wildlife
- 55) Mass dolphin strandings: why do they happen?
- 56) What disease risk do captive propagation facilities (i.e. ducks, quail, and pheasant) present for free-ranging wildlife?
- 57) How do these captive propagation facilities influence habitat conservation?
- 58) Can diseases associated with bird feeders lead to avian population effects and potential zoonoses?
- 59) Are closing caves to human activities the most effective way of controlling white nose syndrome in bats? Discuss the various alternatives.
- 60) What are the negative implications to wildlife and humans caused by feral cats and trap, neuter, and release programs?
- 61) Why is *Eustrongylides* sp. parasite infections in wading birds associated with eutrophication of water bodies? What are the major sources of eutrophication? Are there any viable mitigation steps?
- 62) Are air turbines a safe form of non-fossil fuel energy from a wildlife standpoint? What the potential benefits and costs.
- 63) Why should a wildlife professional be concerned with the increase in agriculture production waste?
- 64) What effects do sublethal concentrations of toxins have on wildlife?
- 65) The listing decision for the wolverine has become very controversial. The topic would be "should wildlife species be protected under ESA if the reason for endangerment is climate change". The Director of FWS decided last week not to list the wolverine because of uncertainty related to climate change.
- 66) When wolf populations reach a sustainable level, should state agencies manage those populations with traditional hunting and trapping?

Fisheries

- 1) How do you solve the invasive Asian Carp dilemma in the Mississippi River Basin?
- 2) Impacts of toxic algae emergence on aquatic communities
- 3) Discuss the emerging trend of ecosystem-based management of commercial fisheries. How does this strategy differ from the traditional single-species management paradigm? How will it benefit both humans and the environment for species that are impacted either directly or indirectly by commercial fishing?
- 4) Discuss the importance of aquaculture to the global food supply for humans and the potential threats to aquatic ecosystems and benefits to capture fisheries.
- 5) How will climate change affect the population dynamics of native Cutthroat trout in the Western U.S.? Likewise, how will marine coral reef ecosystems be affected?
- 6) Discuss the ways that commercial and recreational fishing can be monitored by using GIS methods.
- 7) Effects on animals that eat prepared rations containing bioengineered plant materials (e.g., corn with *Bacillus thuringiensis*)
- 8) Developing sustainable environmental flows: a trend in water management to find a solution to multiple water use demands upon a river or stream (often competing demands) in order to protect stream health as well as serve human needs.
- 9) What are extinction threats for Southern Appalachian fishes? How might they be mitigated?
- 10) Urban hydrology: effects of impervious surfaces, stream ecology, channel adjustments, effects of mixed land uses
- 11) Effects of fly ash on aquatic organisms and water quality.
- 12) Mercury concentrations in fish: how do they vary among fishes and how are humans and wildlife impacted?
- 13) The cascade effect of hemlock adelgid on southern Appalachian streams
- 14) Discuss the 'pros' and 'cons' of using *artificially propagated vs. relocation of native individuals* in stream restoration projects
- 15) How does one determine if a 're-introduced species' in a stream, lake, or reservoir has been a successful (or unsuccessful) endeavor?
- 16) Effects of Appalachian hemlock loss on stream fish and macro-invertebrate populations
- 17) Impacts of 'put-and-take' and 'catch-and-release' fisheries programs on macro-invertebrate and native fish populations
- 18) Where have all the mussels gone?
- 19) Impacts of coal fines on stream organism reproduction
- 20) Are fisherman the main culprit in the spread of whirling disease to new locations? What potential mitigation steps can be implemented?