**CNH Working Group Notes**

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*Intro Section*

* Clarifications for audience
	+ Define invasive and prohibited
	+ Clarify study region
* Prohibited species of plants must go through legislature, but not true of all taxa
	+ For example, zebra mussels can be prohibited directly by agencies
	+ Unclear as to why different taxa are treated differently
* Invasive definition
	+ Can be based on biology and/or socioeconomics, depends on what government entity we consider
	+ In CT the definition is biological, in MA its biological and socioeconomic, at the federal level it’s biological and socioeconomic
* Prohibited species
	+ These are species that you can’t sell and transport
	+ In CT, species that cause biological and/or socioeconomic harm are prohibited
	+ In MA, there’s a noxious plant list derived from the federal list, but changed in the state over time—they added more biology to the listing criteria and adopted a new group to oversee (MIPAG)--- the group used a phase-out approach to prohibited species to allow the hort industry some time to react

*Drivers of Land Use and Species Invasions*

* Lack of education in urban cores—drives movement of people to suburbs
* Population movement generally
* Agricultural production—can people make a living farming, or should they sell land for subdivision development?
* Population growth
* Teleworking—changes movement patterns of people (daily and more long-term)
* Local land use regulations and plans – controls the form and amount of land use change
	+ A number of issues fell under this discussion
		- Subdivision regulations
		- Zoning regulations
		- Rural density and minimum lot size
		- Commercial expansion—for example, can you build in an old ag field?
		- Open space preservation
		- Cluster development—to minimize fragmentation?, controls geometry of development
		- Change in habitat changes movement of wildlife and can increase invasion (wildlife movement is vector for species invading new habitats)
* Utility power lines and cooridors—existing and new proposals (e.g., new pipeline in MA, **Algonquin** pipeline expansion in CT)
	+ Jenica note: Talk to Dave Wagner—are these actually invasion corridors in our region? (Plant and possibly lepidoptera biodiversity surveys have been recently conducted in CT and MA by Dave’s lab)
* Fracking—creates disturbance, edges
	+ 848 million acres owned by BLM (have fracking?)
	+ Subsurface process, but has to come up somewhere
* Deer browse—local, but widespread, increases invasive plants
* Active farmland preservation led by USDA—backlog of funds, but doesn’t have to remain in active ag, succession can occur (which is a pathway for invasions)
	+ Noted that it’s harder and harder to make a living in ag, so incentive to keep ag land active is lower
	+ This pathway driven by economics
* Timber harvest – clearing, creates openings, disturbance
	+ Forest management to impede invasive plants moving in must be active
* Development in riparian areas – subset of zoning regulations
* Land use planning happens at the LOCAL level—plan must be revisited every 10 years
	+ Planning depends on what each town wants
	+ Often all volunteer work, supported by a professional planner
	+ Planning is mostly reactive to plans that developers bring, not really prospective
	+ RPAs (regional planning associations, also called councils of government) provide planning services to smaller towns and provide regional economic development analysis and planning
		- RPAs are most important in towns without their own planning staff
		- Some (most?) RPAs particularly focused on transportation systems—they distribute federal funds via DOT to local communities
		- Funds distributed according to the priorities of the RPA, not of local governments
* Cottontail habitat—thousands of acres, structure of vegetation is important for this conservation goal, composition of native/invasive species not so important (but opportunity to layer one conservation goal onto another pre-existing program?)
* States have a Plan of Conservation and Development—it’s supposed to jive with local and regional plans, but doesn’t have to
* No central state planning office in CT, but other states have them
	+ CT does have six “Growth Management Principles” in its newest State Conservation and Development plan—municipalities must follow those if they want state funds
	+ An attempt to require coordination between local, state, and regional governments
* Lot sizes—determined by town, can have variance within town, determines the geometry of edges (and edges are important habitat for invasive plants)
* Wetlands commissions—no development
* CT seems to operate similarly to MA, but other states may be different
	+ Home rule applies for whole study region though—counties are not really important governing entities in VT or NH either
* MA now has “approval not required” for development—no review required by town if the plan meets requirements, many residential projects
* Edges may not be a proxy for disturbance (but are still important for invasive plants)
* Property values with invasives?
	+ Ranches in western US with weeds have lower value (due to lower forage value)
	+ In the UK, there are insurance rules for Japanese knotweed
	+ There are fire issues with weeds (esp. in western US)
	+ Aquatic weeds can lower lakefront property values
	+ “nature deficit disorder”—people will miss new invasion on their property if they’re not outside
	+ Invasions have no effect on development value—it’s a homeowner problem (perhaps an issue for resale)
	+ Personal values and awareness might affect property purchase—threshold effect? For example, enough bittersweet to be pulling down trees might sway against purchase for some
* Fewer hunters = more deer
* Consulting/mitigation contracts—contractual obligations to manage invasives for up to 5 years
* Towns can have regulated plant lists (but only for plants not on state/federal lists)
	+ Bamboo in CT is an example (town regs, lower appraisals with bamboo on property, harder to resell property)
* In western US, mosaic of public and provate lands
	+ BLM wants to block land, so they try to “exchange out” parcels—for example, if BLM owns small areas of prime real estate around cities, they’ll try to swap it for larger parcels farther from the city (land farther away has lower value per acre, less development value)
	+ However, BLM can’t do a swap if invasives are on the new land, so they have to negotiate with the developers that own the land to do vegetation surveys and treatment of invasives as a condition of the swap (so, no final cost to BLM)
* Link between Lyme disease and barberry
* 20-50 year scenarios, what else do we need to consider?
	+ Sea level rise
	+ Climate change—species moving north to “beat the heat”
	+ Change in precipitation patterns—longer intervals between rain events and more intense precipitation events
	+ Demographic changes of people—intergenerational shift, parcelization and fragmentation of core forests
		- What if millennials purchase more and are more environmentally aware, more altruistic in a sense?
		- Are millennials moving to cities or rural or suburbs? They largely don’t want rural settings.
	+ Fire—disturbance
	+ Water – abandonment of developed area due to lack of water
		- Abandoned areas without funds for restoration and new pressure (edges, etc.) in new high density areas
	+ Intensified pressure for fragmentation—water and demographic change, interaction (20-40 year timeline)
	+ Seed bank
	+ Difficult to predict human behavior change

*Invasive Plant Management*

* Prevention is the best
* Detect early and respond (requires resources)
	+ How can response be induced?
		- State can’t force response, mostly voluntary, educational approach
* Cost can be prohibitive, might just want to let it go and allocate funds elsewhere
* Aquatics—people care and are willing to do more
* If an invasion moves from one property to another, it’s not a state issue (except maybe in the case of bamboo in CT, which is driven by concerns over property value)
* In the western US, the county can manage invasive and bill the property owner—put lien on property if not paid
	+ Peer pressure—there are billboards about invasive plants, much more awareness
	+ Also BLM website, Montana advertising weed program—education and awareness campaigns can help
	+ MA can do this, but hasn’t happened
	+ Highlights a big difference between the western US (rangeland and ag focus) and northeast—land based economies versus not
	+ Weed managers in west are at multiple levels of government—the natural resources effects were great enough that people noticed/cared
* Policy enforcement is very important—whoever develops the policy needs to be the enforcing entity
* Funding is a huge issue—lots of plans, but no funds to actually implement
* Land ownership and organization in New Engalnd more individualized than western US—are NH/VT more coordinated than CT/MA?
* NRCS Soil and Water Conservation districts—get funding through Farm Bill
* Fish and Wildlife Service has funding through Partners program
* There are other USDA programs too (e.g., through private lands and foundations)
* Northeast Aquatic Invasive Species Task Force
	+ Coordinated regional effort to tackle aquatic invasives problem
	+ ME has targeted sticker programs, funding for education and outreach, and monitoring
	+ NH is similar to ME
	+ VT, Lake Champlain area active
	+ NYS has PRISMS (8)—they coordinate invasives efforts, early detection and rapid response, education and outreach, they also work with local organizations, universities, etc. to organize management and monitoring
	+ PRISMS helped lead to consistency in dealing with invasives, led to state level policy
* Contracting
	+ with NRCS is effective, needs landowner buy-in for follow up treatments
	+ Landowner Incentive Program (federal program)—voluntary
	+ Now there are more development projects with MA DOT—invasive species must be managed per contract
	+ Increasing awareness over time
* CISMAs—coordinated invasive species management areas
	+ Partners can include federal and state agencies, land trusts (e.g., the Nature Conservancy and smaller organizations)
	+ CT River watershed: 8 mile watershed (small), Farmington River watershed (small)
	+ CT sub-watershed: Westfield River (large)
	+ SUBOG in eastern MA—involved municipal governments, conservation commissions—perhaps most effective model?—most are still trying to prioritize and then will need funding to implement management and monitoring
	+ 900,000 CISMAs, headwaters
	+ Education and awareness component—“tupperweed” parties for neighbors
* Land use change doesn’t control invasives
* Funding needed for invasives management
* Prioritization of management—perhaps policy can help with this?
	+ We’ll never have enough funding to do everything, look for large areas with lasting effect of managemen
* Check policy inventory for EO 12898 (might be missing?)—this EO needs to become an ACT to be enforceable
* CT-- Invasive Species Council would help?
* An effective template that isn’t well-funded is the Federal Aquatic Nuisance Species Task Force
	+ Below that are panels—could require coordination among panels to control how funds going to states are applied
	+ No terrestrial anaolog for this group
* Local scale—need management policies that don’t require herbicides
* Terrestrial systems aren’t lakes—lakes are a common resource, that’s not necessarily true of terrestrial environments—what we’re trying to protect is spread over many private properties, therefore policies must be different
* Integrated Pest Management (IPM)—can’t have eradication until you have management, chemical treatment isn’t the only option
* UConn Avery Point campus—replanting with non-natives?—Uconn should be aware
* America the Beautiful program—partnership programs for tree planting, can’t use banned trees
* NYS- PRISMs created to cover all of state, impetus came from the state, state put funding behind it, they’re getting a lot done
	+ Sprouted from natural Heritage program, the Nature Conservancy provided initial funding (was just good timing for both groups), each PRISM had to find operational funding though
	+ Not all PRISMs are set up yet, not all have stable coordinator (yet)
	+ State currently provides pots of funding, unclear where it comes from
* CISMAs are grassroots, trying to find funding, struggle to be effective, each group needs a stable coordinator (which requires funding)
* Could give developers (and others, like homeowners) a list of plants they can’t use—couple it with education and awareness program
	+ Would have issues with cultivars though—if some are problematic and others aren’t
* Have to use native plants for restoration projects, but no lists provided
* Biofuels—already proposed plantings of Arundo donax (in Oregon, Midwest, southeast)—OR approved despite USDA and BLM protest
	+ See the Nature study that showed old field successional species were just as productive as other exotic biofuels
* Biofules are subject of US treaties, commitments over time, develop best management practices BMPs) with EPA and USDA approval based on recommendations from science
	+ BLM has requested strong BMPs—wanted bonding to keep tabs on land used for planting
	+ APHIS regulates A. donax, EPA refused to incorporate recommendations from BLM (planting mostly on private land, not public)
* Greater Yellowstone Weed Management Area—example for how to incorporate policy, partnerships, how to find funding, planning—perhaps a template for effective hierarchical management
* Local land trusts—privately owned, large tracts of land
* State organizations of conservation commissions and state organizations of land trusts are worth looking at
* Some land trusts require BMPs, such as cleaning equipment
* Invasive species are not a top environmental issue and environmental issues are not at the top of issue lists overall
* However, invasive species are at the tops of CT landowners minds (recent survey with Mary Tyrell at Yale—Sustaining Family Forests Initiative
	+ Surveyed people are the ones who like to do physical work too (invasives management), but are they doing it well/correctly?

*Roadblocks to Policy*

* Invasives education and elevation of concern
	+ Not enough evidence that they cost the economy and/or landowners
* East vs west—more related to land in west (living, culture)
	+ Advocates to support invasive species as an issue (e.g. congresspeople)
		- For example, Craig in ID (funding lost once he lost his seat), Tester, MD (Nutria control)
	+ Support because grassroots efforts to show these reps the impacts (ECONOMICS, environmental)
	+ Might need itermediates in the process
	+ Can use non-plant examples to drive the point home
* National Invasive Alien Species Week—have an event, launch media campaign to advertise, increase education and awareness—focus on impacts, including aquatics and terrestrial
* CT harm from invasives isn’t inflicted on people making a living off the land—not so immediate
* 100,000 people out of 3.5 million have substantial acreage in CT—most are small landowners
* How much effect does conversion of native to invasive vegetation have on public goods (like water quality, tourism (birding)) at the watershed scale?—one way to look at economics
* Lake George—state investment when local residents found $250k and challenged them—effort moved forward by local level
* Wildlife Forever (BLM)—education and outreach program
* Effects of invasives on wildlife, fishing—message for boaters/fisherman, hunters, recreationists with simple methods for prevention of movement of invasives
* DEEP—works with state and local agencies/orgs on aquatics especially
* USDA—state policies?

*Cross-Jurisdictional Collaboration*

* System for aquatics in place—use as model for more complex terrestrials
* US Fish and Wildlife—Landscape Conservation Coop—pilot in CT Watershed
	+ Many state partners (wildlife plans)
	+ Looking at impacts of invasive on key species and habitats, distributions, and core conservation areas
	+ Thinking beyond invasive species to what we really want (what are the invasives hindering?)
	+ Gathering data, not just on invasives, looking for users of their data—much posted online (Cynthia is contact)
	+ Also doing analyses, extended beyond the CT Watershed
	+ Forward looking, climate change in mind
	+ Nature Conservancy helping with models and maps
	+ Kevin McGarigal at UMass is creating index of ecological integrity to identify areas most important to protect (what properties to buy/protect)

*Other Topics*

* Are we trying to change the attitude of people in the area about invasive species? Think about broader impacts
* How do we convey our message?
	+ Maps—spread of species, change of land use land cover over time (historical, over last 25 years)
* Invasive species programs need prevention, early detection and rapid response, management, and restoration along with education and outreach (about economic impacts especially)
* Broaden collaborative efforts with industry—facilitate information to people electronically
* Use phenology differences to illustrate native vs invasive—visual and explain why it’s important
	+ Punch home message with barberry and tick story
	+ Time lapse video of invaded and non-invaded areas to show phenology differences
* IPANE—revive and expand—many volunteers would like to do something about invasives problem (hands to help manage)
* Why not do things on the ground instead of worrying about policy? Work on organization and partnerships (coordination and pooling of resources)
* Decide how to present the project and who to present it to
	+ Timber harvest example from Bill Hyatt, Chris Martin, and David Sutherland—the key was economic impact
* Do we have an invasive species policy in place to do what we need to do and if not do we need to develop a policy?