

Draft BOF Research Plan Outline—August 31, 2020

- Executive Summary
- Introduction
 - Legislative mandate
 - Goals and objectives
 - Objectives for current and future plans
- Conceptual framework for the research plan
- Background Information
 - Bibliography of documents used as references, hyperlinked to the documents
- Summary of major research categories addressed in the past decade
 - Table with topic area, major contributors, estimate of funding level (low, moderate, or high)
 - Indicate which research topics have ongoing research
 - Limitations to achieving research goals from the 2008 BOF research plan
 - Reliable funding sources, etc.
 - Major areas not addressed requiring additional research
- Prioritized list of potential research topics for this plan.
 - Short (1-2 paragraphs total) description of the documents reviewed to determine which topics and sub-topics to include
 - Prioritized topics and sub-categories
 - Spreadsheet table
 - Include possible approaches to achieve successful research for each topic.
- Long-term funding mechanisms/support issues
- Summary points/conclusions
- References with weblinks
- Appendices
 - Existing Board policy for forestry research

Potential Research Topics

Topic Area	AVG RANKING
Forest Management/Silviculture	
Research into the long-term impacts of forest management strategies to produce forest conditions resilient to disturbance, drought, and climate change (e.g., different thinning regimes/silvicultural activities)	1.17
Effectiveness and impacts of significantly increased pace and scale of fuel reduction and forest health treatments, including tradeoffs ¹	1.17
Research on appropriate reforestation approaches in areas affected by catastrophic wildfire and/or severe tree mortality, accounting for future climate conditions	2.00
Identifying impacts on forest and HWP C pools from fuel reduction and forest health treatments	2.00
Identifying impacts on soil organic carbon pools from forest management (i.e., RX fire, site prep/soil disturbance, uneven-age vs. even-aged management)	2.50
Rx on planting patterns for forest ecosystem resilience and other ecosystem services (i.e., ICO - North GTR220; Tamm Review North et al. 2019)	2.67
Research for the selection of appropriate genetic sources for adapting new plantings for climate change	2.67
Research into re-treatment optimization for forest health and fuels reduction	3.17
Risk Modeling/Planning	
Research to identify forests at greatest risk of type conversion following high-severity disturbances under future climate scenarios; opportunities and challenges	1.33
Research to develop landscape level risk assessments including ecological, wildfire and community risks, identifying any gaps and highlighting the highest priority areas for treatment; incorporating future climate	1.50
Multi-risk decision support for operations -- pre-suppression planning, POD framework; fire transmission	1.83
Research to enhance the predictive capacity of forest health and forest carbon models	2.17
Identify potential climate-induced shifts in the ranges of forest plant and animal species and identify potential areas of refugia for protecting forest health, habitat, biodiversity, and carbon storage.	2.83
Research to identify areas with the most forest carbon at the greatest risk to loss.	3.00
Forest Health	
Long-term monitoring to better understand how forests are responding to changes in climatic conditions (structure, composition, productivity, disturbance regimes)	1.67

Topic Area	AVG RANKING
Identifying impacts on forest and soil organic carbon pools from disturbances (i.e., wildfire severities on black, brown and superaggregate emissions; forest dead pool decay and emissions rates)	2.00
Research on the impact of climate change on individual pest species and the resilience of different forest ecosystems	3.00
Climate Change Mitigation - Nature Based Solutions	1.67
Quantify achievable emission reduction targets for forest sector	1.67
Identify forest management and utilization opportunities for climate mitigation through emissions reductions, avoided emissions	1.83
Research on actual and potential avoided fossil fuel emissions associated with HWP carbon pools to understand trade-offs associated with wood energy and material substitution.	2.00
Perform full GHG and carbon lifecycle analyses for existing and emerging wood products and biomass utilization pathways, including imports	2.33
Research to identify the area and types of uses forest land is converting to; opportunities to reduce conversions	2.80
Research on the effort required to afforest marginal lands/overall benefit.	3.80
Identify soil types that are best suited for biochar integration, and the best application strategies for this material.	3.83
Wood Utilization	1.67
Research to facilitate increased utilization of forest residues and forest products related to fuel reduction and forest health treatments	1.67
Research to remove barriers/incentivize use emerging long lived wood products that enhance carbon storage	1.83
Research on new wood-based products to increase marketing options and/or the utilization value of harvested timber	2.00
	2.33
Wood supply research and tool development for policy analysis and facility siting	2.33
Research on building construction in CA to identify actual wood material substitution opportunities	2.50
Research that improves the efficiency of renewable energy facilities	2.83
Research on the public benefits provided by biomass energy	3.17
Investigation of the potential to convert woody biomass into transportation fuels statewide and regionally	3.17
Fire Science	2.00
Improved prediction of fire hazard: wildland fire behavior, weather/climate, near-term danger/fire potential, and long-term probability of occurrence	1.50
Mitigating adverse wildfire impacts; increasing recovery and resilience of systems with re	1.50
Wildfire mechanics, spread and associated impacts in WUI landscapes	2.17
Research in areas of high tree mortality to better understand post-mortality hazard and succession ²	2.17
Long-term consequences of continued aggressive fire suppression	3.83

Topic Area	AVG RANKING
Forest Ecosystem Services Related to Vulnerable Communities/Human Dimensions	2.17
Research to protect vulnerable communities by expanding wildfire risk models beyond fire-prone topography and vegetation to include socioeconomic factors such as age, car ownership, disability, and ingress or egress corridors that hinder evacuation.	1.83
Public Health issues related to wildfire vs Rx fire	2.00
Equity issues associated with forest health (i.e., which communities are impacted most and most severely by wildfire, tree mortality, etc.)	2.00
Air quality/smoke management, esp policy interventions to support human health and forest health simultaneously	2.33
Indigenous perspectives on forest health and best management practices in forest management.	3.17
Assess the impacts of climate change/extreme weather events on forests within vulnerable communities	3.50
Private landowner incentives /issues	2.33
Research to leverage private sector to achieve fire resilience/forest health/carbon objectives while remaining profitable	2.17
Research on landowner behavior and incentives to adopt climate mitigating forest management and utilization practices (i.e., reduce conversion of forestland to non-forest uses, establish afforestation projects, increase carbon sequestration and storage in urban forests, and promote carbon-rich, climate resilient forests)	2.33
Optimal tree spacing/forest structure for privatelands	2.50
Research on economics of breakeven points for tree size while meeting carbon and resiliency goals (cf. Freid)	2.83
Research to develop opt-in carbon maximization practices for forests that are managed for other uses, including timberlands, similar to the NRCS carbon farming strategies.	3.17
Research to improve landowner ability to address forest carbon concerns in THPs	4.33
CA Forest Practice Rule Effectiveness (BOF Effectiveness Monitoring Committee)	2.50
(see Brandi's list of BOF priorities that match with EMC critical questions)	
Effectiveness of FPR's in managing WLPZs to reduce or minimize potential fire behavior and rate of spread	2.33
Effectiveness of FPR's in minimizing sediment delivery to maintain water quality from mass wasting events during episodic rare events and/or large storms	2.33
Effectiveness of FPR's in reducing sediment delivery to watercourses when the new Road Rules are implemented, including hydrologic disconnection	2.50

Topic Area	AVG RANKING
Effectiveness of FPR's in maintaining and restoring riparian functions of Class II-L watercourses	2.67
Effectiveness of FPR's in identifying northern spotted owl activity centers and protecting nest sites	3.17
Forest Health Monitoring/Data collection	2.67
Research into standardizing and improving forest ecosystem and harvested wood product carbon accounting methods, including more frequent detection of disturbances	2.17
Research and monitoring forest ecosystem and harvested wood product carbon pools	2.17
Research on using LiDAR and and hyperspectral imaging to develop statewide data of forest health and change over time	3.00
Research on growth models, drones/fire detection/real-time weather inputs ³	3.83
Forest Operations	2.83
Research on road systems for forest health treatments and increased wood supply	2.80
Research on tethered logging operations on sensitive landscapes	3.20
Watershed/Aquatic Ecology	3
Forest management treatments for optimal water yield with climate change research across spatial scales and locations to improve confidence in water supply projections	2.33
Post-fire debris flow, erosion and runoff response for improved modeling	2.50
Riparian zone management research to improve salmonid production through elevated primary productivity	3.50
Ecosystem Services Market Development	3.17
Comprehensively calculate the costs and benefits of forest treatment activities compared with a status quo approach, to include suppression, insurance, water quantity and quality, recreation, wildlife habitat, air quality, carbon and other ecosystem services.	3.33
Botanical Resources	3.75
Research on Harvest impacts to botanical resources; strategies for conservation	3.50
Terrestrial Wildlife	3.83
Comparison of how spotted owls and barred owls respond to different forest management activities, regulatory actions and policies, and natural disturbances (e.g., wildfire - amount and severity); tradeoffs	3.00

Topic Area	AVG RANKING
Urban Forests	4.83
Effects from climate change on urban forests; strategies to keep urban forests resilient in a changing climate	3.17
Develop a comprehensive needs assessment for urban forests (threats and overall conditions; coordinated monitoring and pest detection)	3.33
Costs, benefits, feasibility, and acceptability of expanding, enhancing, or adapting urban forests	3.83
Improve mapping and inventory methods	4.50
Field-based and remotely sensed measures of the effects of urban forests on urban heat islands	4.50

¹ moved from fire science

² left here but possibly better suited to sit in Forest Health

³ mixed bag of stuff here -- maybe need to break out

2020 BOF Research Plan References

(Updated August 31, 2020)

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Additional References in Preliminary Stages of Preparation:

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Forest Research Network for Research and Climate Change Monitoring