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Better stewarding the Wabanaki forest for climate benefit

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Introduction

Natural climate solutions, including forests, are increasingly being recognized for their importance in mitigating the climate crisis[i]. In the U.S. alone, forests' current net sequestration of atmospheric carbon is estimated to be 173 Tg per year, which offsets 9.7% of emissions from transportation and energy sources[ii].

But Canada's forests are currently a net source of carbon emissions[iii], rather than a sink, and are themselves vulnerable to the changing climate. These forests have the potential to be a globally-significant sink for emissions – but that requires a change in their stewardship to increase their resilience to the effects of climate change, and to build up their capacity to sequester and store carbon[iv].

Gaps in incorporating climate change into forest stewardship

Incorporating climate change considerations into the sustainable management planning process is increasingly important and often happening ad-hoc by forest stewards out of necessity. The practice of forest management, or stewardship, includes several stages – but at present, there are very few resources and guidance available to forest stewards to incorporate climate change adaptation considerations at each of those stages.

At the earliest stage, forest stewards must identify goals and objectives for the process of planning forest stewardship and adaptation actions – which then requires them to order those objectives in terms of priority. For example, does the steward wish to 1) avoid or reduce the impact of climate-related events, 2) reduce vulnerability to future climatic conditions, 3) manage a broader suite of climate 'risks' or 4) increase resilience and capacity of a forest to recover from climate 'shocks'[v]? And since some objectives or benefits from the forest are commonly at odds with one another[vi], such as

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timber production and biodiversity habitats, the steward must also understand and accept some trade-offs among those objectives.

Understanding the projected impacts of climate change on a forest stand or landscape is a critical ingredient in climate-focused forest stewardship. Since most of the research on climate and forests has focused on vulnerability assessments, this kind of information is fairly accessible – although it still requires the forest manager to apply their expertise at more local levels to model out or build scenarios for more specific adaptation planning[vii]. Part of the process of understanding, and acting to curtail or prevent, the effects of climate change on forests also requires understanding the base-state resilience of the forest ecosystem – the natural level of resilience of a forest will also influence the kinds and intensities of adaptation actions needed[viii]. Reconciling Indigenous knowledge and perspectives on forest stewardship and Western science through the practice of etuapmumk ("Two-eyed seeing"[ix]) is also critically important for lasting, respectful, fulsome stewardship in the face of climate change.

Choosing, and then monitoring the effectiveness of, appropriate adaptation actions requires locally-adapted strategies. These adaptation strategies fall into three categories – those that create resistance to change, promote resilience to change, or enable forests to respond to change[x]. In North America the major themes for such activities may be: 1) regeneration (natural or artificial; single or mixed species), 2) thinning and pruning, 3) fuel-reduction fires and fire suppression, 4) enrichment planting, and 5) silvicultural systems[xi]. Although several resources exist for forest stewards in the Wabanaki forest region in choosing appropriate adaptation strategies, including silvilcultural prescriptions, there is still much work to be done to support stewards in the feasible application of these strategies on the landscape. And given how relatively new much of the practice of climate-adaptive forest stewardship is to managers, monitoring and evaluating adaptation actions as they are applied to forests is an important element of learning for iteratively improving forest stewardship in the face of climate change.

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Recommendations

There are three key areas that should be improved to better equip forest stewards in the Wabanaki forest region to plan out and implement climate adaptation actions:

1) Improve public policy and incentives that support climate-focused forest management widely.

Perhaps the greatest barrier to forest managers in adapting forests to climate change is in the widespread lack of policy and incentives to do so[xii,xiii]. Government policies, resources, and incentives lag significantly behind managers' needs and grass-roots initiatives. In some cases, such as with many provincial timber-focused silviculture subsidies, Government policies are actually detrimental to efforts by forest managers to adapt forests to climate change by continuing to incentivize timber-focused management, which disfavours management for more climate-resilient species. Substantive investment is needed in public policy and corresponding incentives to support widespread adoption of climate-focused forest management planning, strategies, and actions.

2) Substantively increase knowledge creation and dissemination to forest managers.

Although there are notably several forest adaptation resources already developed and available to managers for the Wabanaki forest region, these resources don't provide the full suite of guidance that managers need to incorporate climate change considerations into all stages of the forest management planning process. These adaptation strategies and resources are invaluable for the later stages of the planning process – in choosing appropriate interventions in the forest – but they still require much independent research, knowledge, or initiative by the forest manager (and that likely produces mis-applied adaptation actions and uneven outcomes across the landscape). Forest managers in this region are in need of more scale-relevant data, research, training, guidance, and strategies for operational management planning[xiv] – they need support from Government extension programs and from academic institutions to better understand vulnerabilities of forests to climate change and project future climate impacts on forests.

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3) Develop more nuanced resilience strategies for implementation by managers.
Even the management strategies and actions that are currently available aren't static – they are being iteratively improved as new research and as post-intervention monitoring and evaluation results become available. These management strategies and actions should be more explicitly diversified for varying intensities of ecosystem vulnerability and resilience to ensure they capture the full breadth of conditions and scenarios that face the region's forests. Respecting and incorporating Indigenous knowledge and perspectives on forest stewardship into forest stewardship is also critically important – much more work needs to be done to recognize, welcome, and integrate Indigenous perspectives, knowledge, and values in climate-adaptive forest management[xv,xvi].

These changes require dedicated action especially by Governments and their extension programs, to effect the most rapid and widespread change and on a timeline that the climate crisis warrants.

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