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CLIMATE CHANGE AND PROTECTED PLACES:

ADAPTING TO NEW REALITIES

CITATION

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Abstract

In 2017, the Canadian Parks Council Climate Change Working Group, a team of federal, provincial, and territorial representatives, developed a Climate Change Adaptation Framework for Parks and Protected Areas, guiding practitioners through a simple, effective five-step adaptation process. This framework was adapted by Parks Canada into a two-day adaptation workshop approach, with 11 workshops subsequently held from September 2017 to May 2019 at Parks Canada sites in the Yukon, Quebec, Manitoba, Alberta, Nova Scotia, British Columbia, Newfoundland, and Ontario. Lessons learned from each workshop have been integrated into the approach, with the development of tools and guidance for each phase of the process, and a shareable, visual “placemat” that describes each step of the framework, acting as a map for those navigating the process.

An adaptation framework for parks and protected areas

The United Nations Framework Convention on Climate Change (UNFCCC) defines *adaptation* as “adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts” (UNFCCC 2019). Recognizing the need for adaptation across parks and protected areas in Canada, the Parks Canada Climate Change Team and the Canadian Parks Council Climate Change Working Group undertook a detailed literature review, comparing and contrasting the available climate change adaptation tools and frameworks relevant to protected areas. A Climate Change Adaptation Framework for Parks and Protected Areas was developed through this collaborative process, building upon the adaptation cycle presented in the guidelines *Adapting to Climate Change* from the International Union for Conservation of Nature (Gross et al. 2016), and integrating additional elements and considerations inspired by our conversations and the wealth of resources already available on

the subject (Gleeson et al. 2011; Cross et al. 2012; Williamson et al. 2012; Wilke and Rannow 2013; Stein et al. 2014; Edwards et al. 2015; Rockman et al. 2016).

The five-step adaptation framework (Figure 1) is scalable and adaptable, can be applied to various resources (natural heritage, cultural heritage, built assets, visitor experience, etc.) or a combination thereof, and can be as detailed or conceptual as desired. Instead of presenting the framework as a cycle, suggesting a process that is completed and then repeated, the framework was developed as five distinct steps, with key questions that need to be answered before initiating the following step. Given that adaptation is an iterative process, practitioners are encouraged to return to any prior step of the framework, as the answers for these key questions may evolve over time.

Step 1: Build a Strong Foundation

Before embarking on an adaptation process, it's important to ask the question, “Do we have support to

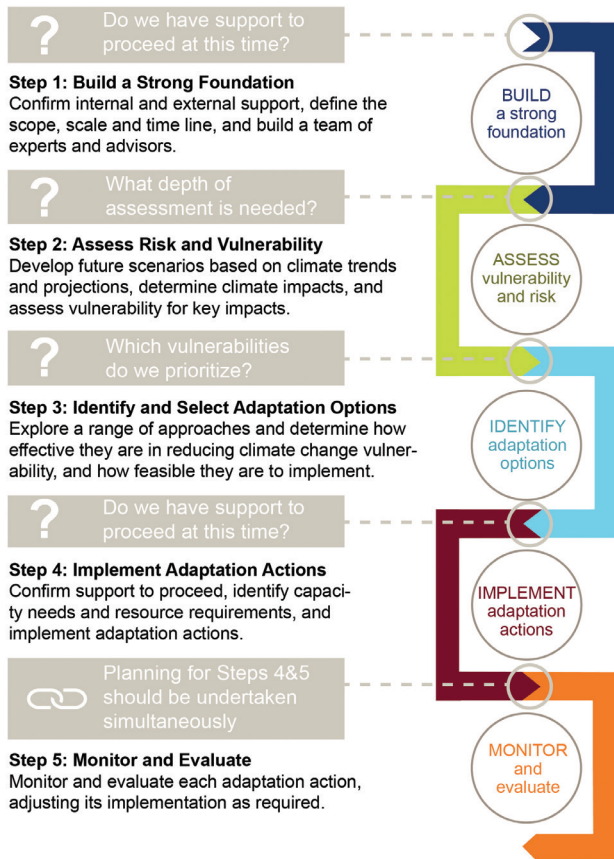


FIGURE 1. Adaptation Framework for Parks and Protected Areas.

proceed?” Confirming support at the very beginning ensures that management and key stakeholders are engaged in and supportive of the adaptation process. Support should be sought from relevant senior managers, colleagues, and collaborators. Depending on your context, external support (e.g., from local residents, organizations, Indigenous communities) may also be essential at this stage.

Step 1: Build a Strong Foundation (Figure 2) includes confirming internal and external (if relevant) support, building a team of experts and advisors, and defining the scope, scale, and timeline of your adaptation process. Your team should include one or more people who play a leadership role throughout the adaptation process. A climate change champion on the senior management team can greatly improve the success of the adaptation process, and can provide strategic direction to the team as needed. Often it helps to have a small team who is engaged throughout the process, and a broader group of advisors who are brought in at key points to provide subject-matter expertise.

In terms of identifying the scope, scale, and timeline of an adaptation process, we found it best to set short-

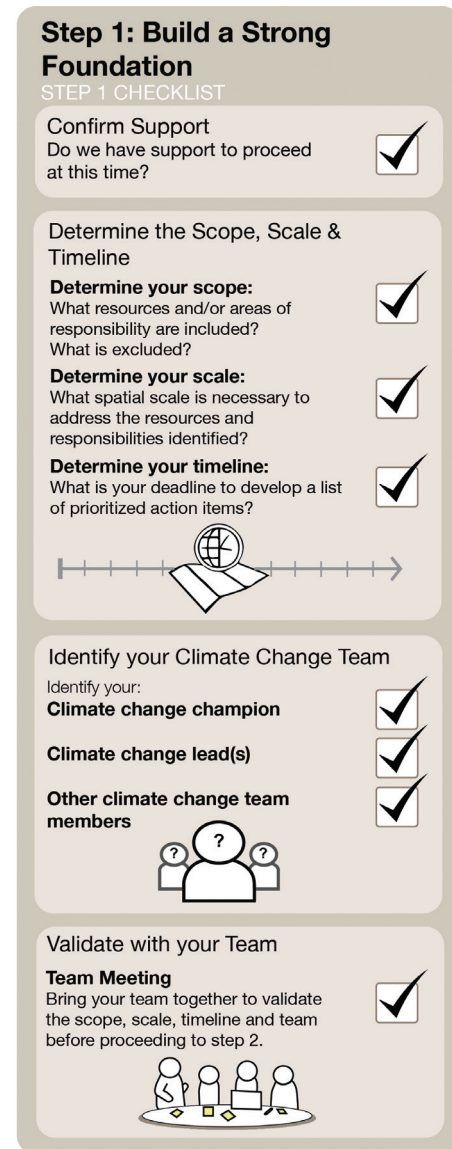


FIGURE 2. Step 1: Build a Strong Foundation

term objectives with a limited scope and scale for our first exploration of adaptation options—better to advance the highest-priority management goals and objectives in the first adaptation iteration.

To determine scope, the adaptation team decides what resources and/or areas of responsibility are included, and what are excluded. Sometimes it is easier to discuss what is out of scope first, and then be more and more specific about what remains in scope. Some broad areas of responsibility at Parks Canada are natural heritage (e.g., species, ecosystems, ecological integrity), cultural heritage (e.g., heritage buildings, objects, landscapes), built assets (e.g., contemporary buildings, bridges, roads and trails, plumbing and electrical infrastructure), and visitor experience (e.g., visitor infrastructure, visitor safety, interpretation). Occupational health and safety also came up in several workshops, as

did impacts on Indigenous cultural keystone species or access to traditional practices.

To determine a timeline for the adaptation process, the team agrees upon a deadline to develop a list of prioritized actions, and identifies short-, medium-, and long-term objectives. Once the short-term goals are achieved, there is always the potential to reevaluate the medium- and long-term goals in light of new information.

Determining the scale of the process is critical to ensure everyone is on the same page—or in this case, on the same map. The geographical scale of the process is closely linked to the resources and responsibilities defined previously in the scoping discussion, and as the team settles on the geographical area of interest, it sometimes finds the need to adjust the scope, and vice versa. There was a range of approaches to scale across the workshops held so far: some teams explored climate risk at the level of an entire park, whereas others selected one target site, and others chose to explore two to three areas or ecosystems. We encourage sites to look for opportunities to focus on a smaller scale and then apply their findings to a broader one.

Before proceeding to *Step 2: Assess Vulnerability and Risk*, we encourage leaders to hold a teleconference with the broader team to validate the scope, scale, and timeline, and to begin the conversation about climate risks. In our workshops so far, participants were asked to share their greatest climate change concern for the site, and in some cases adjustments were made to the scope, scale, and timeline to reflect the priorities of the team.

Step 2: Assess Vulnerability and Risk

Before beginning a risk or vulnerability assessment process, we recommend asking the key question, “What depth of assessment is needed?” Due to the complexity of climate change, detailed assessments can take months or even years. Our experience has shown that viable options can be identified using rapid vulnerability assessments, with the opportunity to return to Step 2 or even Step 1 if more depth or a greater scope or scale was needed.

For the adaptation workshops, the rapid vulnerability assessment is undertaken in one day, with a bit of planning and preparation in advance. The day opens with a review of historical climate trends and projections for the region, prepared in advance from existing data sources and published literature. The exact climate drivers presented will depend on the scope and scale

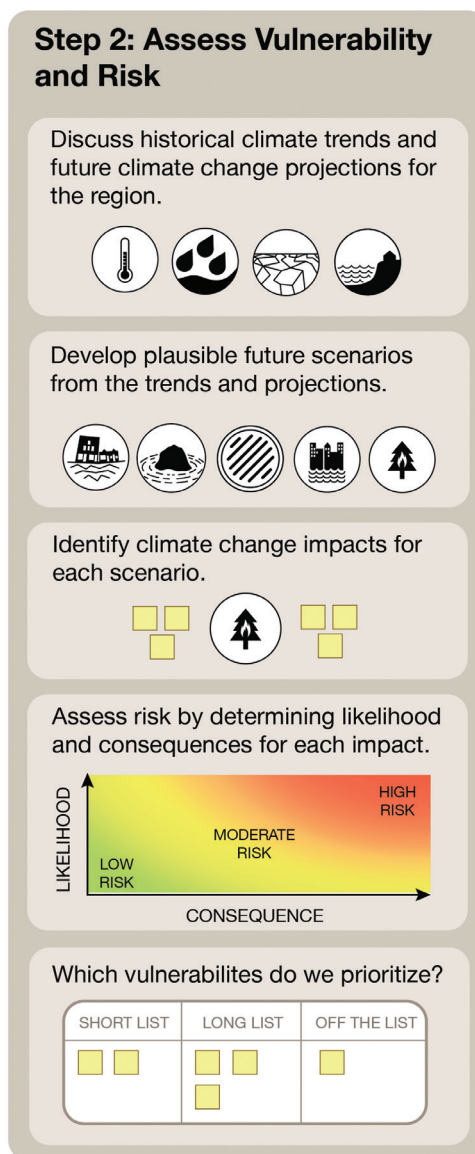


FIGURE 3. Step 2: Assess Vulnerability and Risk

of the workshop, but in our experience to date almost all workshops discussed rising temperature; changes in precipitation; loss of snow, ice, or permafrost; wildfire risk; and extreme weather events.

Plausible future scenarios are collaboratively developed with participants, using simple language to describe the climate drivers of greatest concern. In our workshops, common scenarios included “increased risk of wildfire,” “more frequent and severe floods,” and “increased permafrost thaw.” Often these were prepared in advance based on the concerns raised in the preworkshop teleconference, and then validated with participants on Day 1. This approach to scenario development contrasts with the more time-intensive approach of identifying drivers with the greatest uncertainty and selecting two or more scenarios that reflect the range of possible futures (National Park Service

2013). By emphasizing the futures that are most likely (based on current trends and projections) and also of greatest concern to practitioners, we are able to make our vulnerability assessment that much more rapid.

Once there is agreement among participants on the scenarios, specific impacts on resources of concern are identified. This is often accomplished through breakout groups, either based on scenario, resource type, or different sites within the scope and scale of the adaptation process. Dozens of impacts are identified and documented (either electronically or via sticky notes) and ranked based on likelihood and consequence.

For our likelihood and consequence ratings, we built upon the collaboratively developed North American Marine Protected Area Rapid Vulnerability Assessment Tool from the Commission for Environmental Cooperation (CEC 2017), with the *likelihood* of a specific impact defined as “rare,” “unlikely,” “possible,” “likely,” or “almost certain,” and *consequence* defined as “negligible,” “minor,” “moderate,” “major,” or “catastrophic.” Agreeing upon the likelihood and consequence of each impact can be the most challenging part of each workshop; in our experience, it led to the development of illustrative examples for different areas of responsibility to help guide the discussions.

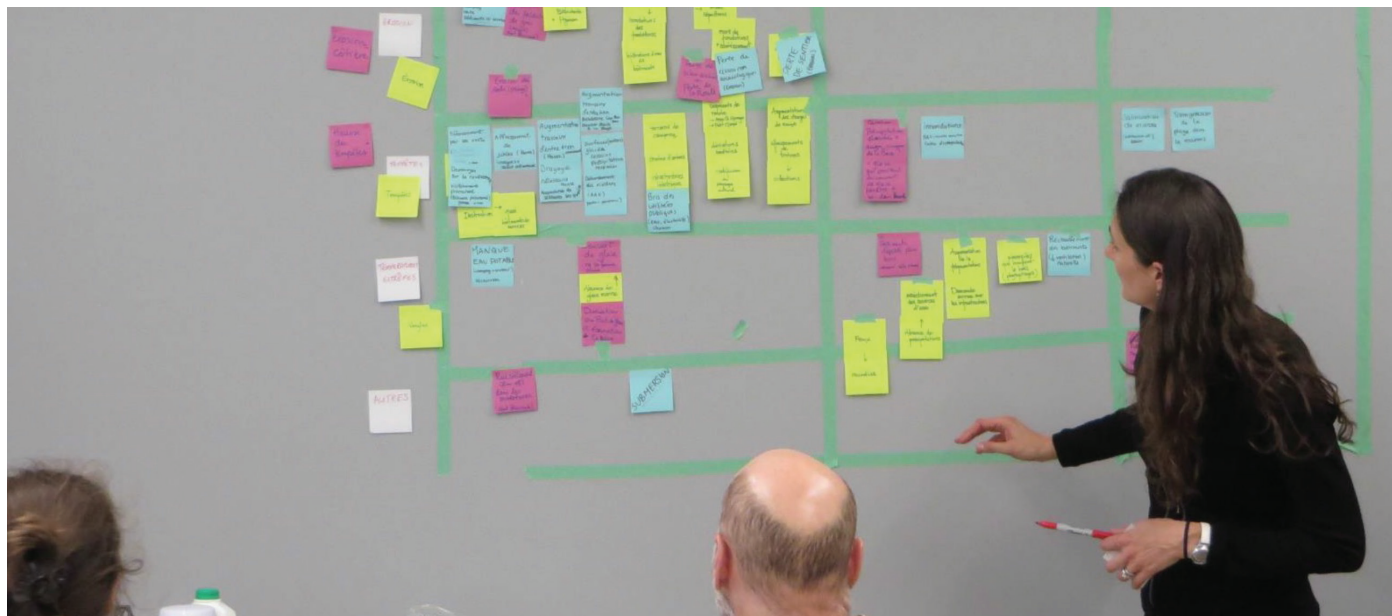
These conversations on likelihood and consequence directly inform the key question for Step 3, “Which vulnerabilities do we prioritize?” (See Figure 4.) Individual impacts are sorted into three categories: *short-term priorities*, which are to be discussed the following day;

long-term priorities, to be addressed in a medium-term adaptation process; and *out-of-scope impacts*, which will not be addressed as part of the current process, but could potentially inform a future iteration. A critical question in this process is, “How does this impact directly or indirectly affect management goals and objectives?” A reminder of the overall management goals and objectives sometimes helps reduce the number of priority impacts to a more manageable number for the next step of the process.

Step 3: Identify and Select Adaptation Options

In *Step 3: Identify and Select Adaptation Options* (Figure 5), practitioners explore a range of approaches and determine their effectiveness and feasibility. In many cases, protected area practitioners are already actively managing climate impacts; therefore we start with current approaches, asking, “How do we currently manage this impact?” In our workshops to date, many sites had already experienced heavy rainfalls that resulted in flood damage; in these cases we asked practitioners how they managed floods in the past, and what were the advantages and disadvantages of those approaches, given the trends and projections identified on Day 1. We then expand the list to include potential future adaptation actions, exploring approaches being undertaken by other organizations and including those that may not have been applied elsewhere but would be worth exploring. These brainstorming sessions often result in dozens of approaches, and practitioners are encouraged to be creative in developing potential ones that had never been implemented before. The advantages and disadvantages of taking minimal or no action are also explored at this phase.

FIGURE 4. Prioritizing vulnerabilities at Forillon National Park, October 2017.

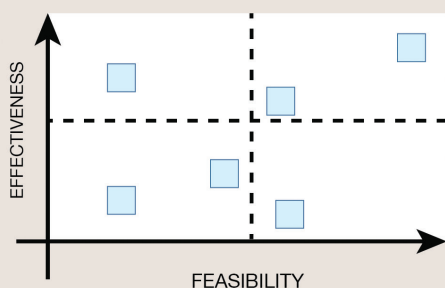


Step 3: Identify and Select Adaptation Options

Identify current and future adaptation actions, discussing advantages and disadvantages of each approach.

IMPACT	APPROACH TO MANAGE IMPACT
	   
	 

Prioritize adaptation options based on effectiveness and feasibility.



Review list of adaptation options and develop next steps.



FIGURE 5. Step 3: Identify & Select Adaptation Options

Practitioners then rank all adaptation options (focusing on one impact at a time) by effectiveness and feasibility, asking the questions, “How effective is this adaptation option at reducing climate change vulnerability?” and “How feasible is this adaptation option given current resources and capacity?”

These rankings provide a snapshot of the most effective and feasible adaptation options, although it’s important to note that low-effectiveness / high-feasibility options may still be prioritized if they have compelling cobenefits, as can high-effectiveness / low-feasibility options if they address resources that are unlikely to be saved through other means. How robust these options are under a range of climate scenarios and how aligned they are with mitigation (greenhouse gas emissions reduction) goals and objectives are also critical discussions that take place at this phase.

All options are recorded electronically, including their advantages, disadvantages, effectiveness, and feasibility, along with any comments and next steps identified. The final phase of the workshop involves prioritizing the options for consideration based on all of the previous discussions. Options that practitioners recommend for implementation are highlighted in green, and those that should not be considered in the future are highlighted in red. Given that some of these options are current approaches, this is a valuable process for identifying actions we should stop taking immediately; i.e., actions that do not make sense in a changing climate, even if they made sense previously. Many options fall somewhere in the middle—they may require further research or may be favorable only under certain conditions—and these are highlighted in yellow. Potential next steps are identified for green and yellow adaptation options, and the workshops end with a quick review of next steps and roles and responsibilities for *Step 4: Implement Adaptation Actions* and *Step 5: Monitor and Evaluate*.

Step 4: Implement Adaptation Actions;

Step 5: Monitor and Evaluate

Before implementing priority actions, it is essential to return to the question that started your adaptation process: “Do we have support to proceed at this time?” At the level of a specific action, the key question is, “What level of support is needed to implement this action?” For example, there are often actions that could be implemented immediately at the site level without additional resources or approval at a higher level. This helps empower staff to act on things that are within their area of responsibility and authority. Actions that need more resources and/or direction from senior management will probably need a more strategic approach to get support for implementation.

Confirming support for Step 4 can be very different than confirming it for Step 1. For example, in Step 1 support might consist of approval by management for going through the adaptation planning process, obtaining time commitments from team members, etc. At the Step 4 stage of implementation, the support needed is often more substantive, potentially requiring decision-making by senior management; allocation of additional resources; assigning accountability to appropriate managers and staff to implement actions, reporting, and tracking of progress; and possibly changes to policy.

Prioritized options need to be evaluated against the broad spectrum of actions and priorities at the site level, and considered beyond their benefits for climate

change adaptation. In some cases, options may not be supported by senior managers or key stakeholders, and additional actions or adjustments will need to be explored. Once support for a specific action has been confirmed, planning for *Step 4: Implement Adaptation Actions*, and *Step 5: Monitor and Evaluate*, can begin.

Planning for Step 4 and Step 5 should be undertaken simultaneously, as effective monitoring is critical to evaluating the success of the action, and will inform future iterations of the process, both at the current site and potentially other sites that are considering similar actions. Your monitoring and evaluation approach may also inform the design of your actions, which is another reason they need to be developed together.

In this step, it's important to fully develop the action by identifying capacity needs and resource requirements over the implementation and evaluation timeframe. The action may have to be reevaluated or adjusted as new information or techniques become available. Practitioners may also wish to return briefly to Step 2 to complete a targeted, more detailed vulnerability assessment on the most relevant aspect of the site or resource, to better plan and implement the selected action.

A large number of options have been identified over the 11 adaptation workshops so far, including climate-resilient practices that are in place and should be continued, and maladaptive approaches that need to be discontinued. In the case of more complex adaptation approaches, particularly those that have not yet been implemented at Parks Canada sites, scoping and planning activities are underway, and, where needed, new research and analysis are being undertaken. Implementing adaptation action is an active area of work at Parks Canada today, with a number of new tools and resources in development.

Conclusion

The Climate Change Adaptation Framework for Parks and Protected Areas, and the accompanying adaptation workshop approach, were developed to support adaptation action across a broad range of protected areas in Canada. The approach emphasizes the use of rapid vulnerability assessments, allowing practitioners to identify adaptation options as soon as possible and pinpoint those that meet the greatest climate change risks and vulnerabilities. From this perspective, the adaptation workshops have been a resounding success: hundreds of adaptation options have been identified across a wide spectrum of resources, locations, and

contexts, and dozens of actions have been prioritized for implementation.

More recent efforts at Parks Canada are focused on accelerating implementation of adaptation actions: translating lists of potential options into comprehensive action plans, compiling and cataloguing options to support decisionmaking in places that have yet to host a workshop, researching and integrating additional conservation frameworks and templates, and mainstreaming adaptation into other organizational processes. Building on our successes and learning from our experiences, Parks Canada will continue to advance climate change adaptation action through research and collaboration.

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