Climate change adaptation action plan

2025–28

Department of Conservation
Te Papa Atawhai

Te Kāwanatanga o Aotearoa
New Zealand Government

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Department of Conservation Te Papa Atawhai
PO Box 10420, Wellington 6140
New Zealand

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Editing and design:
Te Rōpū Ratonga Auaha, Creative Services

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Contents

Tūturuatu/shore plover. *Photo: DOC*

Executive summary

Climate change is affecting the biodiversity, and visitor and cultural heritage sites that the Department of Conservation Te Papa Atawhai (DOC) is responsible for managing. These issues will continue to intensify over the coming decades. Because of the scale of the resources DOC manages, a focused approach is needed that identifies and progresses the most important actions to prepare for climate change.

This plan identifies eight high-level actions DOC will focus on over the next 3 years to prepare for the effects of climate change. It is organised around five themes:

1. **Prepare:** acquire comprehensive and accurate data and analysis to plan and carry out effective actions.
2. **Assess:** gain an understanding of the specific harmful climate change effects faced by vulnerable species and ecosystems, and assets and cultural heritage sites now and in the future.
3. **Plan:** design adaptation work to address short- and long-term climate change risks.
4. **Implement:** take action to prepare for climate impacts.
5. **Monitor and evaluate:** understand whether the actions we have taken were effective or not, and adjust.

The plan also includes two frameworks we will use to support managers to be clear in what adaptation objective we are aiming for when managing a site, species or ecosystem. These frameworks also make it easier to weave adaptation efforts into our day-to-day work and business processes.

These actions will be coordinated internally, and small teams will be established to design and deliver a specific action or group of actions. Because these issues will continue to increase in the foreseeable future, DOC will periodically refresh this plan to respond to change and refine its responses.

Introduction

The role the Department of Conservation Te Papa Atawhai (DOC) plays in managing Aotearoa New Zealand's public conservation land and waters puts us at the forefront of responding to climate change risks. The biodiversity, visitor and cultural heritage sites we oversee are being affected by climate change, and these impacts will continue to intensify over the coming decades.

Like the orange triangles along a track, this plan will guide our climate adaptation journey for the next 3 years. It provides focus for our limited resources and will support us to build the knowledge and tools to carry out the work needed to face the threat posed by climate change.

Living the changes

On 2 February 2022, rain began to fall in Kahurangi National Park in the South Island as Cyclone Dovi approached. While the area is not as well known for downpours as parts of the West Coast farther south, the area receives its fair share of rain, averaging about 127 millimetres over a typical February (NIWA 2024). Over the next 4 days, nearly double that amount fell, with another 155 millimetres falling from 9 to 13 February (NIWA 2025). The flooding of the Heaphy River that followed took out three bridges along the Heaphy Track, one of Aotearoa New Zealand's Great Walks. One bridge was severely damaged, while two were completely destroyed. It would be more than 20 months until the track was fully open again to tramping.

This was not the first time extreme weather had caused damage on the track. In 2011, a bridge over the Lewis River was taken out by flooding; it was replaced by one of the bridges later destroyed by Cyclone Dovi. As climate change continues to intensify, DOC must prepare for extreme weather events as they become more routine. Modelling by NIWA shows that rainfall events, such as the one that caused devastation along the Heaphy River, could happen twice as frequently by 2090 (NIWA 2017).

Aotearoa New Zealand's biodiversity is also at risk. While the top of the South Island struggled with too much rain, other areas dealt with the opposite problem. One of the last remaining coastal wetlands in the country, Awarua Wetland near Invercargill, faced drought. The wetland is home to threatened plants and animals, including the extremely rare pukunui/southern New Zealand dotterel. Unusual dryness in the area in January and February 2022 turned into a full drought in March and April (NIWA 2023). When a fire was lit illegally in the wetlands on 2 April, tinder-dry conditions and high winds took over, spreading the wildfire to almost 1,000 hectares and putting rare and endangered species at risk (Pronger et al. 2024). The fire also burned into the wetland's peat layer, a carbon-rich soil, releasing additional climate-warming carbon.

Preparing for the future

To prepare for climate change impacts such as these, DOC developed a climate change adaptation action plan in 2019 and updated it in 2023. The plan was important for getting things started, but much work remains. This current plan builds on earlier efforts and connects with *Te Mana o te Taiao – Aotearoa New Zealand Biodiversity Strategy 2020* and the DOC Strategy, to guide actions over the next 3 years.

Climate change is inescapable, but work has started to prepare for and adapt to it. For example, when bridges were rebuilt along the Heaphy Track in 2023, significant climate change modelling was done to guide a move out of the flood risk zone, increasing resilience. Work to re-wet wetlands to make them more resilient to climate change is being researched. Predator and pest control are helping take the stress off threatened species so they can better cope with increasing climate change pressures.

This plan aims to help move work forward. It will help us to target work and take action when it is less costly to do so, before adverse outcomes to biodiversity, visitor experiences and cultural heritage become locked in. By doing so, we can protect these precious resources for future generations.

New swing bridge over the Heaphy River on the Heaphy Track.
Photo: Liz Carlson

Strategic approach

What we need to do

As our experience increasingly shows, climate change affects all the work DOC does. We manage more than 15,000 species of plants and animals, more than 4,300 of which are threatened or at risk of extinction. And we manage more than 15,000 cultural heritage sites, and almost 22,000 visitor assets, including nearly 15,000 kilometres of track. Because of this scale, a daunting amount of work would be needed to adapt everything we are responsible for managing. We undertook a strategic analysis of the full adaptation process to understand the size of the job we face, so we could identify the most important areas to focus on with the resources we have.

What we can do

The scale of the challenge means we must be targeted in our approach and take a long-term view. It is not possible to undertake it all right away and often we need to plan or assess risk before we can do the work on the ground. This plan focuses on a prioritised set of actions that DOC will work on first (over the next 3 years). These actions will have the greatest impact and/or are needed to unlock additional work, and can be progressed with the current resourcing available.

This plan is based on an adaptation process with five stages. Eight actions have been prioritised across the five stages.

Adaptation frameworks

DOC needs to plan clear, purposeful and effective actions to reduce the effects of climate change. Adaptation frameworks support managers to be clear about what adaptation objective we are aiming for when managing a site, species or ecosystem for climate change. These frameworks also make it easier to weave adaptation efforts into our day-to-day work and business processes.

We are using two climate change adaptation frameworks:

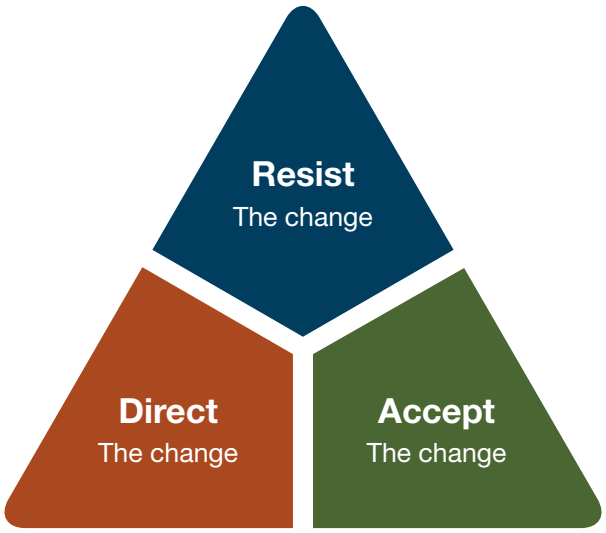
- The Resist–Adapt–Direct (RAD) framework for species and ecosystems focuses on managing ecological transformation caused by climate change.
- The Protect–Maintain–Retreat (PMR) framework helps us manage climate change risks to assets and cultural heritage sites.

The use of these frameworks to set objectives and drive management work is an innovative approach for embedding adaptation into our regular workflows. It will help us ensure the actions we take are deliberate and serve a clear purpose.

Tararua Forest Park. *Photo: Leon Everett*

Resist–Accept–Direct (RAD) framework

Many species and ecosystems will transform as temperatures warm and rainfall patterns change. For example, animals may move or adjust to new conditions, and the mix of species in ecosystems may shift. Three approaches are possible for managing this change, and these are captured by the RAD framework. Setting a RAD objective for each species or ecosystem that is vulnerable to climate change will allow us to prepare in a purposeful way and avoid maladaptation.



Resist
Management actions intervene to maintain or restore the ecosystem or species based on historical or acceptable current-day conditions.

Accept
Allow the ecosystem or species to drift away from current conditions on its own without intervening to alter the trajectory.

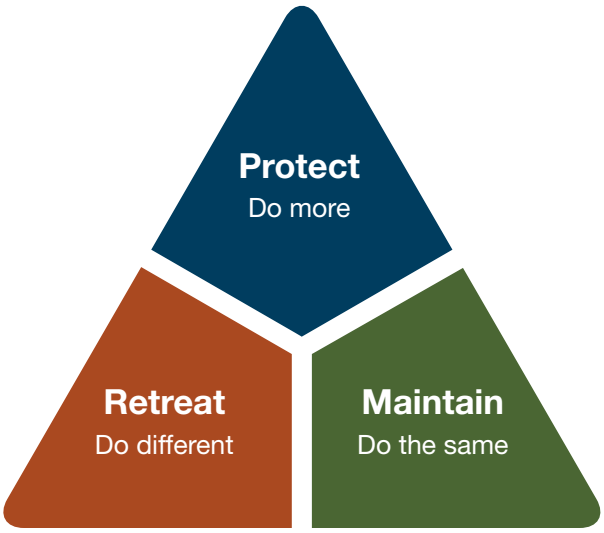
Direct
Intervene to actively guide the ecosystem or species to a preferred state or configuration that is different from current conditions.

Ways that this process could work are:

- Adaptation work for a Resist objective could include building cooling shelters to protect a shorebird from extreme heat, or removing invasive weeds.
- Adaptation work for an Accept objective could include monitoring a stable species for signs of increasing climate change risk.
- Adaptation work for a Direct objective could include translocating a species to an area that is outside its historic range, but could be suitable in a future climate.

Protect–Maintain–Retreat (PMR) framework

Managing risk from climate change hazards now and in the future is essential for effectively and efficiently preparing our assets and cultural heritage sites for climate change. The PMR framework sets out three possible objectives for managing these hazards at a site.



Protect
Reduce exposure or mitigate the ongoing and future risk.

Maintain
Keep the asset in the hazard zone at the current risk level, with no action to reduce risk.

Retreat
Remove the asset or relocate from the hazard zone to avoid current and/or future risk.

Ways that this process could work are:

- Adaptation work for a Protect objective could include fortifying riverbanks to protect a cultural heritage site from increased erosion.
- Adaptation work for a Maintain objective could include currently planned upkeep for a track.
- Adaptation work for a Retreat objective could include relocating a hut away from an area where landslides are projected to increase.

Theme – Prepare

Comprehensive and accurate data and analysis are needed to plan and carry out effective actions. Information is needed on biodiversity, such as where species live and their ability to withstand climate change pressures. For assets and cultural heritage, accurate location data are needed to know if they are, or could be, exposed to a climate change hazard.

Climate change projections, including models that give information on how climate change risks may change in the future, are also important for planning. By using these data and this analysis, we can evaluate how exposed or vulnerable a site, species or ecosystem is to climate change.

In some cases, these data and models already exist, but in many others, the data and analysis are patchy, inconsistent or absent.

Action 1: Acquire data

Ensure we have the data needed for assessments.

This will help us to fill in missing risk information, so everyone can have confidence in the evidence base and assessments that DOC makes available. Ultimately, better knowledge of species and ecosystems improves our ability to support them to thrive.

This includes the following:

- Acquiring biodiversity data:
  - Undertake a gap analysis to identify data needs for species and ecosystem climate change vulnerability and risk assessments, including information on current spatial distribution, climate sensitivity and adaptive capacity.
  - Develop a long-term plan for acquiring missing data, including prioritisation guidance and coordination with programmes in BioInvest (DOC's decision support system for its biodiversity portfolio).
- Acquiring asset data:
  - Undertake a stocktake to ensure we have complete spatial data for all assets and property we manage or own.
  - Develop a plan for acquiring missing data, if needed.
- Acquiring cultural heritage data:
  - Undertake a stocktake of heritage data that is needed and/or available. This includes information that may influence management, such as extrinsic values, value to iwi, or whether a site is actively managed.
  - Develop a plan for acquiring missing data.

Action 2: Determine exposure to climate change hazards

Understand which DOC assets and cultural heritage sites are exposed to climate change hazards.

By knowing where our assets are likely to be exposed to climate hazards, we can plan for how to handle the risks and prioritise where more detailed analysis is needed.

This includes the following:

- Mapping and quantifying exposure to significant natural hazards affected by climate change (for example, sea level rise and coastal inundation, flooding, wildfire, landslides, drought, wind) at a national scale for:
    - visitor infrastructure
    - DOC property
    - cultural heritage sites
    - contaminated sites.

Landslide damage on the Lake Marian Track. *Photo: DOC*

Theme – Assess

It is crucial we gain an understanding of the specific harmful climate change effects that are faced by vulnerable species and ecosystems, and assets and cultural heritage sites now and in the future. Information on these risks will help us to plan effective adaptation.

We need to understand how climate change will affect other pressures on biodiversity, such as pests, predators and weeds, or habitat loss. Taking care of these problems is a core part of DOC's work to protect nature, but it is also important for climate change adaptation. By reducing other threats to plants and animals, it makes them stronger and more resilient to the effects of climate change.

We also need to understand how management options may be affected by climate change. For example, we currently rely on pesticides for weed control. What would happen if they lose effectiveness as temperatures rise, or if trapping invasive predators along rivers becomes more difficult because of a higher risk of losing traps in a wetter climate?

Action 3: Assess climate change impacts on biodiversity pressures

Understand how climate change will affect risks from biodiversity pressures.

This will help us know how climate change could shift the way we will need to manage pressures on biodiversity, such as pests and weeds.

This includes the following:

- Assessing climate change impacts on significant biodiversity pressures:
    - Undertake work to understand how climate change may alter the risk from other pressures to biodiversity. Assessments may be site- or pressure-based and include individual species of pests, weeds (including wilding pines) and pathogens, water abstraction, phenology changes, ungulate browsers, land use and/or habitat loss, or changes in food web dynamics.

Action 4: Assess climate change risk

Understand relative climate change risks for species and ecosystems vulnerable to climate change impacts and undertake risk profiles for DOC assets and cultural heritage places.

This will help us target resources to the species, ecosystems and places most at risk.

This includes the following:

- Developing climate change risk assessments for species and ecosystems:
  - Undertake climate change risk assessments for highly vulnerable and threatened terrestrial, freshwater and marine species and ecosystems.
  - Develop a process for rapid risk assessment for species and ecosystems with lower vulnerability to climate change or at a lower threat classification level.
- Developing climate change risk assessments for assets and cultural heritage sites:
  - Undertake climate change risk assessments at sites found to be exposed to a climate change hazard for:
    - visitor sites
    - DOC property
    - cultural heritage sites
    - contaminated sites.
  - Develop a process for rapid risk assessment for lower-priority visitor and cultural heritage sites.

CASE STUDY

Prepare–Assess–Plan: Impacts of climate change at Franz Josef Glacier

Some of Aotearoa New Zealand's most popular visitor experiences are at risk from the changing climate. For example, the Franz Josef Glacier is receding due to warmer temperatures and may be out of sight from popular viewing areas in the coming years. The melting ice is also causing the riverbed to rise due to gravel buildup, resulting in more damaging floods that affect visitor access, as well as the local community.

Gaining a better understanding of how the frequency and severity of floods could change in the future under climate change will help us assess the risk to roads and tracks that make the visitor experience possible. This would allow DOC to work alongside the local community, iwi, councils and other government agencies to plan where it makes the most sense to protect, maintain or retreat an asset, site or experience like the Franz Josef Glacier.

Theme – Plan

Proper planning is essential for getting our actions right and for being effective. This is the vital connection between knowing and doing.

Setting RAD and PMR objectives is a critical step for integrating climate change preparation into our existing planning systems and making it part of our business-as-usual work. With these objectives set, scientists and managers can design actions to address climate change risks, together with our partners, such as Treaty partners and communities. Embedding the planned work in our business systems helps ensure the adaptation process is seamless.

Dynamic adaptive pathway plans or detailed adaptation plans may be developed where a need exists for detailed planning, for example, for important visitor experiences or highly endangered species or ecosystems.

Action 5: Set adaptation objectives

Assign adaptation objectives in our business systems for species and ecosystems, and assets and cultural heritage sites, to ensure a purposeful approach for managing climate risks is built into DOC's work.

Using these frameworks will help us work toward the same adaptation objectives and ensure our adaptation planning is proactive, consistent and strategy led.

This includes the following:

- Setting a RAD adaptation objective for species and ecosystems:
  - Develop a process for determining the RAD objective (including which information to use to inform the RAD choice).
  - Provide training and support on the RAD framework for teams that develop management plans.
  - Assign and record RAD objectives in our biodiversity resourcing system for all species and ecosystems that have a climate change pressure.
  - Develop a process for changing the RAD objective when required.
- Setting a PMR adaptation objective for assets and cultural heritage sites:
  - Develop a process for determining the PMR objective (including which information to use) for sites exposed to climate change hazards.
  - Identify and update existing business systems to be able to record and embed the PMR objective.
  - Assign and record PMR objectives for visitor and cultural heritage sites, DOC property, and contaminated sites.

Action 6: Plan and embed work to reduce climate change risks

Plan or reshape existing work to align with the adaptation objective and address climate change risks identified in risk assessments. Embed the planned work in business systems.

Designing work to reduce climate change risks and making it part of our business-as-usual processes will make it easy for us to deliver conservation outcomes.

This includes the following:

- Developing management actions for biodiversity:
  - Design adaptation work that responds to the risks identified in species and ecosystem risk assessments and aligns with the RAD objective for a site.
  - Add work actions to species and ecosystems management plans in the BioInvest system.
- Developing management actions for assets:
  - Design adaptation work that responds to the risks identified in asset risk assessments and aligns with the PMR objective for a site.
  - Develop a process for incorporating planned adaptation work into existing business systems, such as enterprise asset management and 10-year capital plans.
  - Embed triggers and thresholds for changing the PMR objective in planning systems and processes.
- Developing management actions for cultural heritage:
  - Design adaptation work that responds to the risks identified in cultural heritage risk assessments and aligns with the PMR objective for a site.
  - Develop a process for incorporating planned adaptation work into business systems, such as the cultural heritage portfolio.
  - Embed triggers and thresholds for changing the PMR objective in planning systems and processes.

Theme – Implement

Taking action to prepare for climate change is the whole point of planning and building data and evidence.

Work will be carried out by DOC and its partners and will vary depending on the objectives set for a species or site. In some cases, it may involve actively intervening to protect a species. For example, a hut may be relocated away from a possible landslide area, or work could be done with iwi to create new habitat that is above the level of expected sea level rise. In other cases, it may involve an approach where we monitor changes to the climate until they reach a point where they begin to create a risk and trigger an action.

Action 7: Carry out work to reduce climate change risk

Do the planned work to address climate change risks to biodiversity, assets and cultural heritage.

Delivering the work will build resilience for biodiversity, visitors and cultural heritage, and strengthen climate change adaptation skills.

This includes:

- using DOC resources and/or working with partners to carry out work to reduce climate change impacts
- building internal capability to incorporate climate change adaptation when carrying out responsive or unplanned work.

CASE STUDY

Adaptation makes a difference

The tarapirohe/black-fronted tern, a Nationally Endangered resident of Canterbury's braided rivers, faces many threats. To help tarapirohe chicks resist the effects of climate change, about 60 shelters were distributed across breeding colonies in 2022/23 so the chicks could escape extreme heat that exceeded 40°C. Unfortunately, chicks at a site without shelters succumbed to the heat, but none died from heat exhaustion where the shelters were available (Connor-Mclean et al. 2023).

Tarapirohe. *Photo: Ian Southey*

Theme – Monitor and evaluate

Monitoring and evaluation tell us whether the actions we have taken were effective or not. They tell us whether actions have reduced the climate change risks at a site or whether a species or ecosystem is more resilient to impacts from climate change.

To do this, we need monitoring data to tell us what is happening to the site or species. We need evaluations that can assess the effectiveness of management actions and whether they are meeting our adaptation objectives. An adaptive management process feeds this information back into the planning step to make adjustments as necessary.

Action 8: Evaluate effectiveness of adaptation actions

Assess the effectiveness of work to address climate change risks to biodiversity, assets and cultural heritage.

By reviewing the work we have done, we make sure the actions we take have an impact. It allows us to adjust our approach if the work is not meeting the needs of the species, ecosystems or sites, and to share these learnings with others.

This includes:

- identifying the monitoring data needed to assess the effectiveness of adaptation work
- collecting data and evaluating the effectiveness of adaptation work
- incorporating evaluation findings into planning and assessment steps, and adjusting adaptation work as needed.

Delivering the actions

This climate change adaptation action plan outlines the actions DOC will focus on over the next 3 years to prepare for climate change impacts. These actions will be coordinated internally, and small teams will be established to design and deliver a specific action or group of actions. The high-level nature of the actions in the plan provides flexibility in their delivery, so teams can set up efficient and impactful work programmes.

Climate change in Aotearoa New Zealand is already affecting DOC and the biodiversity, visitor experiences and cultural heritage it manages. Because these impacts will continue to increase in the foreseeable future, DOC will periodically refresh this plan to respond to change and refine our responses.

Rimurapa/bull kelp. *Photo: DOC*

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