SYNOPSIS

Compensating for significant reductions and modifications of flows on Mackenzie country braided rivers because of hydro-electric development – Impacts on avifauna, lizards, terrestrial invertebrates, terrestrial plants

Scope

- Impacts on threatened flora and fauna.
- Impacts on representative river and wetland communities.
- Impacts on rare, threatened ecosystem types.
- Impacts of considerable flow reductions and modifications on the Pukaki, Tekapo and Ohau Rivers.
- Impacts of considerable modifications of natural flows on the lower Waitaki River
- Flooding of significant river and wetland habitats and loss of significant flora and fauna under Lake Pukaki, Lake Benmore, Lake Aviemore, Lake Waitaki and Lake Tekapo.

Principle

It is not possible to 'avoid, remedy or mitigate' impacts of water loss and modification. Therefore, we have developed a range of management actions that would compensate for water loss and modification.

What has been lost because of significant reductions and modifications of flows

- Healthy functioning braided river habitats and healthy flora and fauna communities on rivers with:
    - natural flow instability and variation, which is underpinned by a definable minimum flow, i.e., both the longer term lower to medium flows and the periodic flood and fresh events;
    - the maintenance of the riverbed sediment supply, which helps maintain an active and mobile riverbed;
    - the maintenance of an overall active riverbed width to provide for the natural braiding patterns; and
    - a balance of non-vegetated and only lightly, naturally vegetated terrestrial environments within the active riverbed area.

Impacts on terrestrial flora and fauna

1. Significant reductions in flows result in:
    - Dewatering of some riverbeds resulting in loss of breeding and feeding habitats.
    - Significant increases in access of predators to islands on braided rivers, resulting in higher predation rates of fauna.
    - Increased area of predator habitat and predator refuges on islands that sustain local predator numbers because of weed encroachment.
    - Loss of flood events, which reduces sediment movement events and changes sediment to finer types, resulting in:
        - stabilisation of channels
        - increased weed encroachment
        - increased habitat for introduced predators and further reductions in survival and breeding success
        - reduction in food availability

    - reduction in breeding habitats
    - Loss of down-stream connectivity of new shingle habitats (facilitated by sediment transport).
- Aseasonal discharges during spill-way events, flooding nesting habitat and resulting in direct loss of nests, eggs and chicks, particularly impacting threatened species.
- Loss of freshes, which results in activation of invertebrate drift (thus reducing food availability for some bird species).
- Likely loss of feeding habitats and reduced food supplies for riverbed wildlife from reduced flows.
- Drying of riparian habitats, including spring creeks, wetlands and seepages.

2. Disconnection of dispersal pathways by barriers (canal construction)
    - Reduced ability to disperse in ground dwelling fauna and potentially plants.

3. Direct flooding of braided river habitats and riparian wetlands and dryland habitats
    - Direct loss of approximately 20 km^2 of significant habitats in lower Ahuriri River
    - Direct loss of approximately 25 km^2 of significant habitats in lower Tekapo/Ohau Rivers
    - Direct loss of >50 km^2 of significant habitats in lower Tasman River
    - Direct loss of approximately 20 km^2 of significant habitats covered by Lakes Aviemore and Waitaki
    - Unknown amount of loss, shores of Lake Tekapo

Management activities compensating for impacts on terrestrial flora and fauna

Detailed research by Project River Recovery (and other braided river restoration initiatives nationally) has provided a rich repository of work that allows us to identify which actions are required to compensate for impacts on the Tekapo, Ohau, Pukaki and lower Waitaki Rivers and for compensating for loss of habitats flooded by hydro development (Table 1).

Table 1. Management programmes and actions required to compensate for flow reductions and flow modification.

Management programme	Management Action	Direct /Indirect management of effects	Description
Aquatic weed control	Weed control	Direct	Lower flows increase aquatic weeds; reduces food availability
Browsing mammal control	Lagomorph control	Indirect	Reducing food supplies of predators (rabbits/hares) reduces predator levels and intensity of predator control
Climate change adaptation	Translocation of threatened species	Direct	Increased pressure on water take, further reducing connectivity and habitat suitability; requires artificial movement (translocations) of less mobile species

Disturbance	Manage on-river disturbance	Indirect	Increased levels of disturbance, particularly vehicle use, lowers productivity and survival
Predatory bird control	Control black-backed gulls and harriers	Indirect	Reducing numbers of predatory birds to natural levels offsets impacts of mammalian predators to a degree
Predatory fish management	Trout and salmon control	Direct	Increased stabilisation of channels and banks exacerbating weed encroachment and enhancing salmonid habitat
Restorative actions	Clearing braided river islands	Direct	Mechanical clearing removes vegetation and increases habitat availability and reduces predator levels if sufficient flows present
	Predator fence construction	Indirect	Creates habitat refuges for sensitive threatened species that do not benefit from standard past control actions
	Restoration planting	Direct	Compensates for loss of threatened plant species, past habitat loss and loss of habitat connectivity
	Translocation of threatened species	Indirect	Artificial movement (translocations) of less mobile species to compensate for past habitat loss and loss of habitat connectivity (e.g. invertebrates, lizards, plants)
Small mammal predator control	Cats and possums	Direct	Reductions in flows significantly increases access of predators to islands and increased weed cover increases habitat to encourage residency of predators; reduction in transformative flood flows limits weed clearance, thus retaining predator habitats constantly
	Ferrets	Direct	
	Mice	Direct	
	Stoats, weasels, hedgehogs, rats	Direct	
Stock management	Stock fencing	Direct	Reduced flows increase access of stock to islands, increasing disturbance, trampling habitats and reducing nesting success
Terrestrial weed control	Clearing islands and banks	Direct	Stabilisation of flows reduces channel movement and sediment redistribution and reduces weed clearance during floods; increases in finer sediments increase weed habitat; weeds increase numbers of resident predators
	Spot spraying	Direct	

Costs of compensating for impacts on terrestrial flora and fauna

Using this knowledge, costs of maintaining and/or restoring braided river flora and fauna can all be estimated for compensating for impacts on the Tekapo, Ohau, Pukaki and lower Waitaki Rivers and for compensating for loss of habitats flooded by hydro development (see Table 2). Management costs are based on Lewis & Maloney (2020). Costs of other maintaining or restoring alternative sites

in the Mackenzie Basin have also been calculated. However,assigning costs to compensate for affected areas has not yet been done for impacts on lake shore flora and fauna, for disconnection of some streams and for loss of riparian wetlands.

Table 2. Estimated costs of managing Mackenzie Basin sites modified by loss and modification of water from hydro-electric power generation

Modified site	**Compensatory management site**	**Year 1 cost (set up)**	**Average annual cost (35 yrs)**
Tekapo River	Tekapo River	$3,842,706	$1,600,794
Ohau River	Ohau River	$2,135,196	$1,458,310
Pukaki River	Pukaki River	$2,035,920	$1,367,149
Lower Waitaki River	Lower Waitaki River	$4,526,514	$1,819,221
Lower Ahuriri (flooded)	Lower Ahuriri (unflooded)	$2,898,852	$1,234,596
Lower Tekapo (flooded)	Godley River	$2,554,615	$674,647
Lake Tekapo (shoreline)	??	??	??
Lower Tasman (flooded)	Hopkins River	$3,383,744	$874,355
Riverbed covered by Lakes Aviemore and Waitaki	Share with lower Ahuriri cost??	-	-
Riparian wetlands	Costs available for individual wetlands	??	??
Disconnected streams	??	??	??
Totals		**$21,377,547**	**$9,029,072**

Reference

Lewis, D.; Maloney R. 2020. Project Rive Recovery mitigation work. A costing estimate of potential mitigation actions for hydro-electric activity in the Waitaki catchment. Department of Conservation, Wellington.

From: Richard Maloney
To: Ken Hughey
Cc: Dean Nelson; Herb Familton
Subject: FW: RE: For action: Waitaki HEPS document review by COP 14/02
Date: Friday, 2 December 2022 2:13:19 pm
Attachments: Budget 2022 overhead assumptions.xlsx

Hi Ken
You are asking about where the overheads came from.
Below is the general back and forwards emails we had at the time. The attached was some generic overhead costs we received. I think that we had agreed it was too complex to apply the specific overheads as per the spreadsheet, because we didn't have enough detail on what work (and therefore what staff) was being agreed to at the time. Therefore we would apply a blanket % value over the agreed total.
From that we had agreed on a %overheads to be included (?15-30% - which did you use?), alongside the CPI inflation adjustment for the amount, on top of the base amount for [opex + a contingency for activity delivery = 20% in the Lewis and Maloney doco].
Hope that helps.
Cheers

Richard

From: Richard Maloney
Sent: Monday, 14 February 2022 7:30 am
To: Robert Wypych rwypych@doc.govt.nz; Christopher Rendall crendall@doc.govt.nz; Jan Tait jtait@doc.govt.nz; Sarah Yarrow syarrow@doc.govt.nz
Cc: Dean Nelson dnelson@doc.govt.nz
Subject: MŌ: RE: For action: Waitaki HEPS document review by COP 14/02
Hi Chris
I think the simplest approach maybe to stick with the overhead approach Jan suggested below and make it realistic / cover all extra costs.
Note that DOC is also charging out its staff hours to projects it supports 9 (2) (i) at +30%.
Cheers
Richard
Sent from Workspace ONE Boxer
On 11/02/2022 9:23 pm, Christopher Rendall <crendall@doc.govt.nz> wrote:
Thanks both – it sounds like overhead/FTE approach assumes that a structure is in place to do admin and the cost of that isn't factored in? It would be good to have the full costing for this rather than assuming that eg DOC will cover the HR etc. We havent discussed the deliver model in detail at this stage but I think that there is a general inclination to some separation from DOC eg trust which would require full reasonable costing to avoid cutting into/undermining ability to deliver (which seems to be a pretty common issue that isn't factored in at the outset)
Sarah – you/living water may have experience with this?
Thanks
Chris

Mai: Jan Tait <jtait@doc.govt.nz>
I Tukua: Friday, 11 February 2022 3:05 pm
Ki: Richard Maloney <rmaloney@doc.govt.nz>; Christopher Rendall <crendall@doc.govt.nz>; Robert Wypych <rwypych@doc.govt.nz>
P: Dean Nelson <dnelson@doc.govt.nz>
Marau: RE: RE: For action: Waitaki HEPS document review by COP 14/02
Thanks Richard.

- I am not sure about Budget 2018, but Budget 2022 used an overhead/FTE basis. If that is

not logical to apply in this instance, then it would be good to work through what more reasonable assumptions would be.

- I agree that the costs presented to the potential funders should be per cashflow estimates rather than average annual costs
- I suggest being clear it excludes inflation for now. It may be best to factor in a CPI adjustment annually into the contract? A question for Procurement.

Ngā mihi,
Jan

From: Richard Maloney <rmaloney@doc.govt.nz>
Sent: Friday, 11 February 2022 2:46 pm
To: Christopher Rendall <crendall@doc.govt.nz>; Jan Tait <jtait@doc.govt.nz>; Robert Wypych <rwypych@doc.govt.nz>
Cc: Dean Nelson <dnelson@doc.govt.nz>
Subject: RE: RE: For action: Waitaki HEPS document review by COP 14/02

Hi Chris, Jan, Robert
Some responses below inserted in Jan's email. Happy to discuss more next week Jan.
Cheers
Richard

From: Christopher Rendall <crendall@doc.govt.nz>
Sent: Friday, 11 February 2022 2:35 pm
To: Dean Nelson <dnelson@doc.govt.nz>; Richard Maloney <rmaloney@doc.govt.nz>
Subject: Fwd: RE: For action: Waitaki HEPS document review by COP 14/02

Kia ora Richard and Dean
You are likely better placed to respond than me about current arrangements and how the costing for the paper were decided.
Thanks
Chris
Sent from Workspace ONE Boxer
---------- Forwarded message ----------
From: Jan Tait <jtait@doc.govt.nz>
Date: 11/02/2022 1:56 pm
Subject: RE: For action: Waitaki HEPS document review by COP 14/02
To: Christopher Rendall <crendall@doc.govt.nz>
Cc: Robert Wypych <rwypych@doc.govt.nz>
Hi Chris,

I see you are meeting with generators (Meridien & Genesis I presume) on Thursday next week, so are looking to have your doc with high level cost estimate approved by Jo by Tuesday.

For an estimate of **overheads**, I have attached what our strategic finance team used for overhead assumptions for our Budget 2022 bid.

This assumes the programme of work will be delivered by DOC resources, and is applied on an FTE basis. Note – it doesn't include ongoing HR support, specialised needs for training equipment/uniforms/ISS etc.

** *For this amount of money I think it would be wise to include all indirects (HR, training, uniforms, vehicle lease costs, accommodation + fit out, computer costs etc etc) – I though the Budget18 process had concluded this was best approach?*

Robert – do you have experience of whether these overhead assumptions are sufficient where there may be new office space/fit out etc needed for such a significant increase in operations?

Your paper states $18.8m pa cost, but there is a comment about a cost of $59m plus ongoing costs of c$4m pa – I am keen to get a better understanding of this – perhaps we can have a quick session to step through the costing model? The pivots tab in the model shows the

$59m and an ongoing cost of about $10m?

***the $18.8m is the total cost over 35 annualised. The actual first year cost if all work started at once is the $59m amount, and ongoing costs over the rest of the 34 years average around $4m. We need to be careful about whether we are asking for a flat annual amount, or whether there is room for higher top up amounts in the first few years as we set up work. Otherwise the setup costs are going to blow most of the first several years budget*

You could state the figures exclude **inflation** (as we do for Govt budget bids), but if you want to include to show real expected cost, then for inflation assumptions, a useful resource is: Half Year Economic and Fiscal Update 2021 - 15 December 2021 (treasury.govt.nz) PDF page 12 (document page 8):

Year ending June:	2021	2022	2023	2024	2025	2026
Forecast CPI inflation (annual % change)	3.3	5.1	3.1	2.7	2.4	2.2

***don't mind either way, as long as its good accountancy practise and all assumptions are declared and covered by the funder in the agreement where appropriate*

Am also keen to understand the current funding arrangement - I assume the energy companies fund DOC and other entities to carry out the restoration/mitigation work? Does DOC invoice them?

***as I understand it, its an annual payment from funder into a DOC national account that is then drawn down internally into WBS code to match actual expenditure monthly.*

Ngā mihi,
Jan

From: Robert Wypych <rwypych@doc.govt.nz>
Sent: Thursday, 10 February 2022 11:02 am
To: Jan Tait <jtait@doc.govt.nz>
Subject: RE: For action: Waitaki HEPS document review by COP 14/02

…or I'm WFH tomorrow if urgent…

Regards,

Robert Wypych
Senior National Management Accountant
Department of Conservation | Te Papa Atawhai

9 (2) (a) [redacted]
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From: Robert Wypych
Sent: Thursday, 10 February 2022 11:01 am
To: Jan Tait <jtait@doc.govt.nz>
Subject: RE: For action: Waitaki HEPS document review by COP 14/02

Hey Jan – we can catch up next Tue – I'm be WFH – or Wed in the office, your call…

Regards,

Robert Wypych
Senior National Management Accountant
Department of Conservation | Te Papa Atawhai

9 (2) (a) [redacted]
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From: Christopher Rendall <crendall@doc.govt.nz>
Sent: Thursday, 10 February 2022 10:47 am
To: Jan Tait <jtait@doc.govt.nz>; Robert Wypych <rwypych@doc.govt.nz>
Subject: WM: For action: Waitaki HEPS document review by COP 14/02

Hi Jan & Robert
I have just left a 'holding' statement on overheads – let me know if I should add anything else.
Thanks
Chris

Mai: Christopher Rendall
I Tukua: Thursday, 10 February 2022 10:24 am
Ki: Herb Familton <hfamilton@doc.govt.nz>; Nicola Toki <ntoki@doc.govt.nz>; Karina M rrow <kmorrow@doc.govt.nz>; Jo Macpherson <jmacpherson@doc.govt.nz>; Colin O'Donnell <CODONNELL@doc.govt.nz>; Alexander Macdonald <alemacdonald@doc.govt.nz>; Michael Hayward <mhayward@doc.govt.nz>; Dean Nelson <dnelson@doc.govt.nz>; Susan Newell <snewell@doc.govt.nz>; Cassie Mealey <cmealey@doc.govt.nz>; Andrew Grant <agrant@doc.govt.nz>; Tanya Vance <tvance@doc.govt.nz>; Richard Maloney <rmaloney@doc.govt.nz>; C ris Woolmore <cwoolmore@doc.govt.nz>
Marau: For action: Waitaki HEPS document review by COP 14/02

Kia ora
In preparation for next weeks discussion with generato s please review: DOC-6882088. Alex sent through some helpful comments about structure and focus so it differs from previous versions you may have considered.
Please add any comments and track changes you see fit.
Jo - I will look to you to approve it next Tuesday so the document can be sent to generators prior to the meeting.
Richard – are you comfortable with your and Debbie's work to be provided to generators. Would it need anything additional as caveats/context if provided? I am not intending on sending it with the paper but they are likely to ask for it.
Thanks in advance.
Chris

Generic corporate overhead costs for Budget 2022

Line Item	Cost	Frequency	Year 1	Out years
Superannuation- Kiwisaver	3%	Per annum	$3,600	$3,600
ACC Levies	2%	Per annum	$2,400	$2,400
Recruitment - advertising	$750	One off	$750	
Recruitment fees	15%	One off	$18,000	
Travel	$3,000	Per annum	$3,000	$3,000
Onboarding	$250	One off	$250	
Uniform & PPE	$1,250	Per annum	$1,250	$1,250
Training	$1,500	Per annum	$1,500	$1,500
ISS licences and laptop	$6,400	Per annum	$6,400	$6,400
Work station set up/ongoing property	$3,500	Per annum	$3,500	$3,500
Mobile phone annual charges	$1,000	Per annum	$1,000	$1,000
Salary assumption	$120,000			

From: Jo Macpherson
To: Henry Weston; Marie Long
Cc: Ken Hughey; Herb Familton; Kelly Riggir; Debby Drummond
Subject: Meridian / Genesis
Date: Tuesday, 25 October 2022 7:10:24 am
Attachments: Henry recc Waitaki - DOC-7167639 (5).docx
Importance: High

Mōrena Henry and Marie
Ken and I are now at the point where we need to go back to the Generators indicating that we have the high-level approvals from DOC to enable them to take the attached Statement of intent, and proposed Native Biodiversity Programme negotiated by the department and the Generators in the Waitaki. Marie, I understand you are aware of this.
The Generators are keen to shortly take it to their board fairly shortly (next week or two). We are seeking your endorsement to confirm back to the generators that we are happy to proceed. The attached memo provides the context and current agreement. We are really happy with where we have landed, and it is looking really positive moving forward.
Please keep Ken in the loop on any response here, as Ken will respond back to the Generators.
Thanks Jo

From: Kelly Lewis <klewis@doc.govt.nz>
Sent: Thursday, 20 October 2022 1:41 pm
To: Jo Macpherson <jmacpherson@doc.govt.nz>
Cc: Ken Hughey <khughey@doc.govt.nz>
Subject: RE: Generators
Importance: High
Hi Jo,
Here it is (linked and attached): DOC-7167639
The agreement is attached behind the memo to Henry. Would you like me to add to Henry's Daily?
Ngā mihi nui,
Kelly
Kelly Lewis
Personal Assistant to Jo Macpherson, Director Operations, Eastern South Island

From: Jo Macpherson
To: Herb Familton
Cc: Ken Hughey
Subject: Henry recc Waitaki - DOC-7167639
Date: Thursday, 6 October 2022 11:28:22 am
Attachments: Henry recc Waitaki - DOC-7167639.docx

Hi Herb,
I have popped on some track changes and comments (attached a copy for Kens quick look if he wants)
Can you tidy up and then let me know once done and I will ask Kelly to put it into Henrys Daily today. It closes off at 3pm.
I couldn't figure out how to delete the comments in the out of scope perhaps you will have more luck…
Thanks so much
Henry recc Waitaki
https://doccm.doc.govt.nz/cwxv4/wcc/faces/wccdoc?dDocName=DOC-7167639
Ngā mihi

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