Preloading for the future: establishing mitigation success for intra and inter-generational expectations

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Avoid, remedy, or mitigate

- Part 2, 5(2)(c)

  Avoiding, remedying, or mitigating any adverse effects

- Schedule 4 1(g)

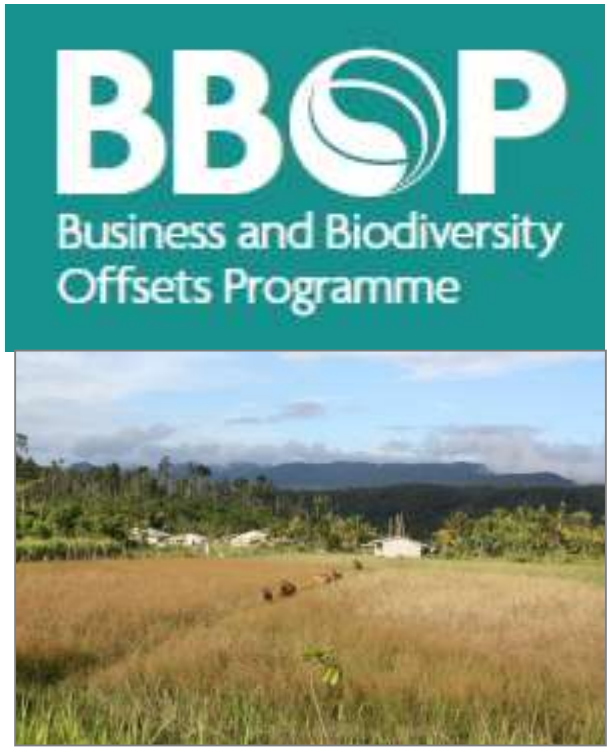
  A description of the mitigation measures (safeguards and contingency plans where relevant) to be undertaken to help prevent or reduce the actual or potential effect

Impact management

- Avoiding the impact altogether, by modifying design or operations or seeking an alternative location.
- Minimising the impact by limiting the degree or magnitude of an action, or implementing best practice treatment of controls to minimise impact.
- Rectifying impacts through repair, reinstatement or restoration of the receptor site.
- Offsetting residual impacts by replacing or enhancing substitute resources or environments.
- Compensating for the impact by providing substitute resources for implementation elsewhere or for a different purpose.

EcIA Guidelines for NZ

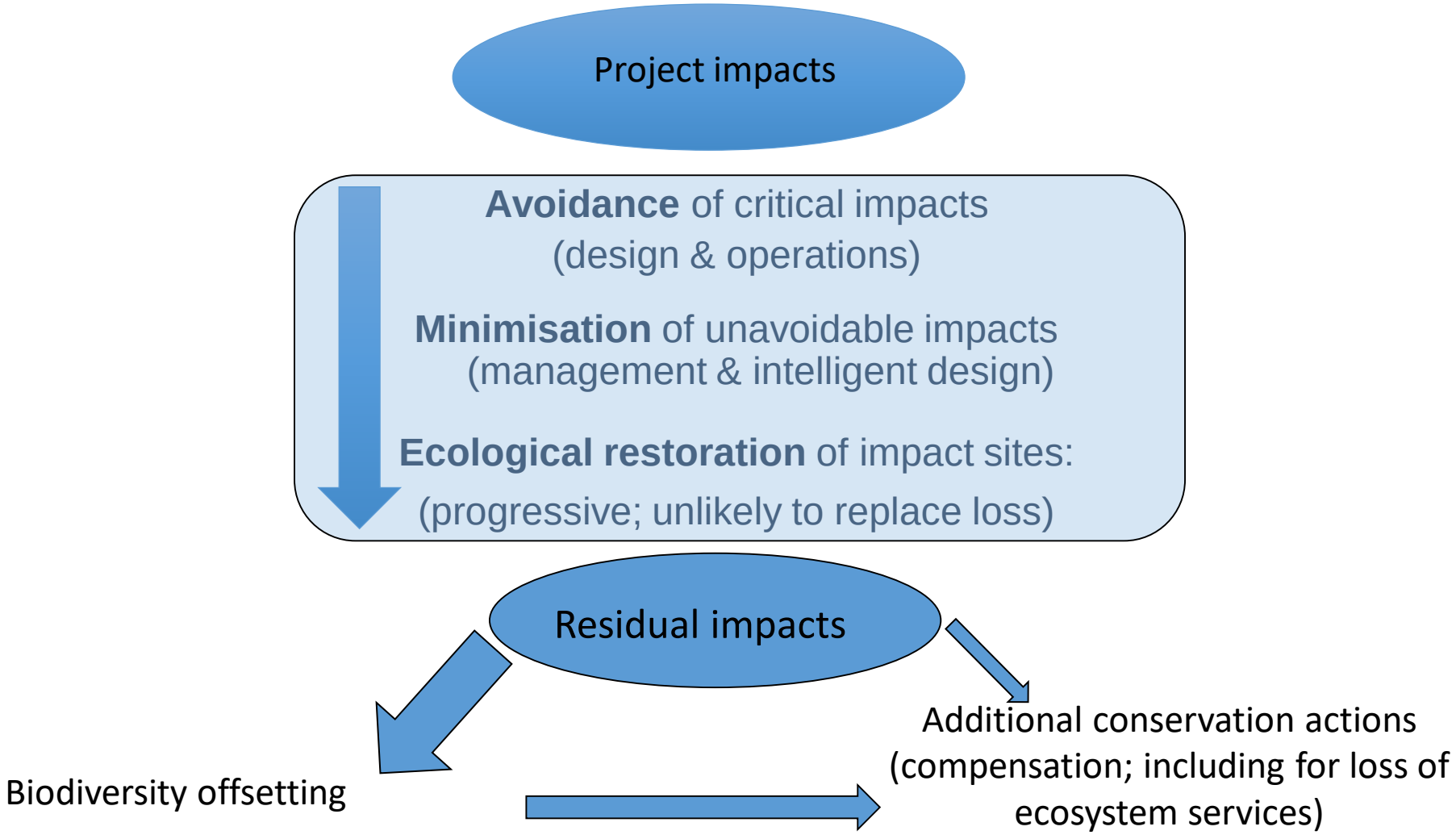
BBOP biodiversity offset principles



BBOP offsets are based on 10 principles:

I. Adherence to **Mitigation Hierarchy**
II. Identify & apply **limits** to what can be offset
III. Ecosystem scale (landscape context)
IV. No *net* loss, preferably net gain
V. Additionality of conservation outcomes
VI. Stakeholder **participation** – project & offset affected
VII. Equity (including customary rights)
VIII. Long-term persistence of outcomes
IX. Transparency of design & implementation
X. Use of scientific & traditional **knowledge** systems

Mitigation Hierarchy



Effective mitigation/offset/compensation?

- Do we assess the success or effectiveness of mitigation?
- Is implementation/completion sufficient to ensure effectiveness?
- Adaptive management – do we really do this for mitigation
- Is mitigation nimble enough to adapt?

Effective mitigation measures

Completion

- Area planted
- Canopy cover
- Buffering
- Species dominance

Success

- Community structure
- Population density
- % Native species
- Understorey development
- Water quality target
- Functionality
- Target species

Stream Ecological Valuation (SEV) Environmental Compensation Ratio (ECR)

- Mechanism for calculating compensation for stream loss/infill
- Typically requires a stream site for improvement
- Typically is riparian planting and fencing along a required length (or stream area)

- Typically a requirement to ensure mitigation is implemented/completed
- Rarely a requirement to confirm mitigation stream has improved (cf. SEV score or ecological condition)
- What would be expected if anticipated SEV score was not reached?

Examples of success objectives / measures

- There has been no increase in the number or distribution of invasive weed species, or any introduction of invasive weeds, as a result of construction.
- Areas of significant bird and bat habitat identified for protection during detailed design have been avoided where practicable.
- Where practicable, native lizards (both skinks and geckos) are captured from works sites and relocated to suitable habitat elsewhere within the property away from construction footprint.

- Diversions provide suitable habitat for aquatic communities and facilitate fish passage.
- Plants have established and are showing vitality, following one year from installation.

Examples of success objectives / measures

- Fish passage monitoring
- Upstream juveniles the following season

Translocations

Lizards and geckoes

Northland green gecko

‘Tatahi’ skink

Rawiri-kahikatoa vegetation

Dune gumland

Wet gumland

Wet gumland

Pitfalls

- Insufficient goal setting with regard to habitat functions
- Poor descriptions of the measures
- Unrecognizable implementation
- Unsuitable site conditions
- Improper implementation methods
- Deficient follow-up management
- Poor integration of contemporary ecological restoration practice measures were simply not carried out.

Tischew et al. 2008

Key elements of effective mitigation planning

- Clear purpose and intent
- Timeframe (for completion, for success)
- Baseline or reference measures
- Success/effectiveness measures identified
- Success/effectiveness criteria

- Completion vs success measures

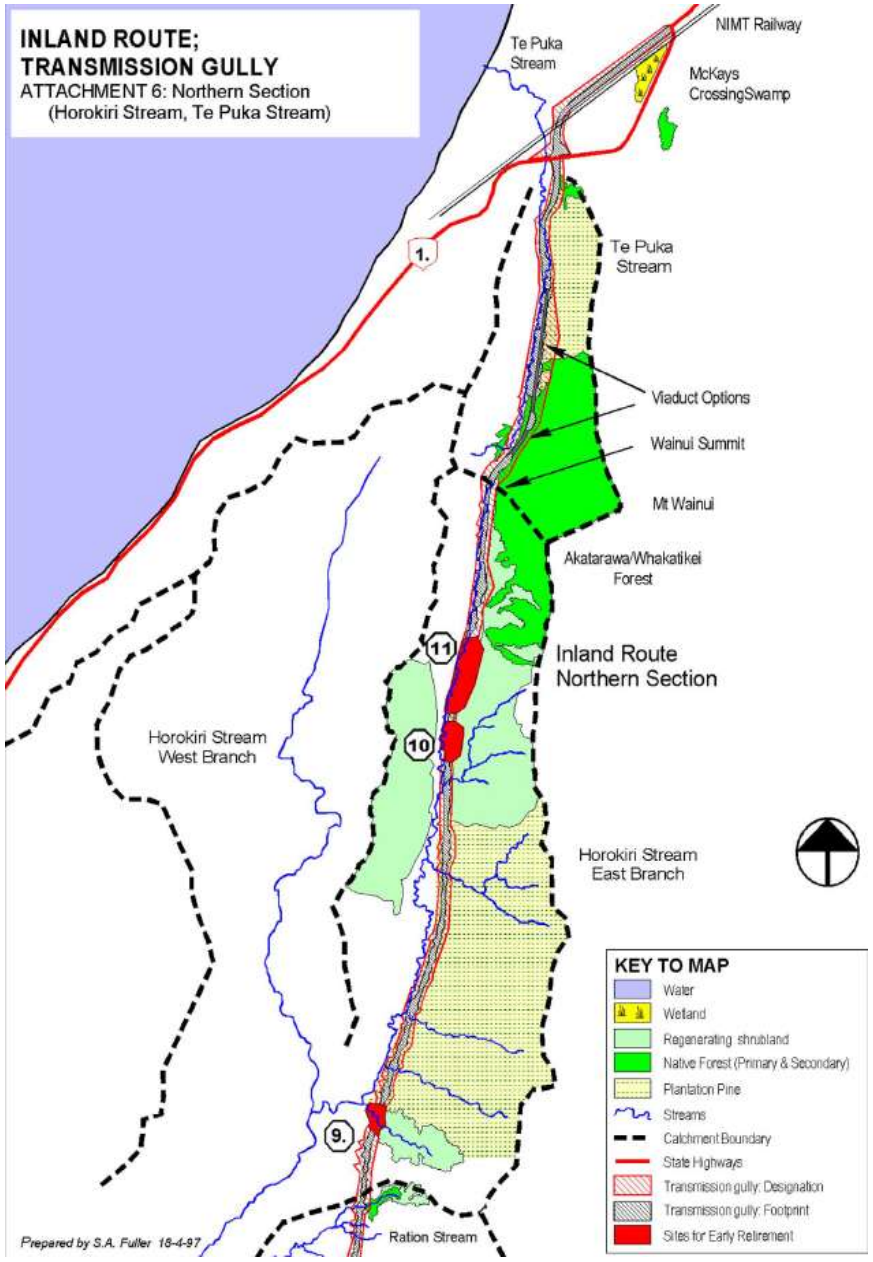
Advance Ecological Mitigation

- Is providing mitigation in advance a good idea?
- What does it mean for mitigation quantum?
- Can it be a simple as pest and predator management?
- What happens if development does not proceed?

- Can the mitigation be transferred to another project?
- What is mitigation transfer

Advanced Ecological Mitigation

- Advanced mitigation for stream loss and to provide a buffer between construction and the streams.
- Majority of sites were planted in and around 2007
- 62,000 indigenous plants along proposed route
- Approximately 10 years of age
- AEM planting of ~ 31 ha, with ~ 4 ha of that riparian (protecting 1960 m of stream).



Transferring mitigation

- No net loss
  - A target for a project in which there is no overall reduction in the value attributed to the adversely affected biodiversity, as measured by type, amount and condition.
- Trading up mitigation/compensation
  - Generally benefits rarer biodiversity/habitat/function
- Out-of-kind mitigation/compensation
  - May result in benefits to very different biodiversity/habitat/function thatn that lost/impacted

What metrics/ratios would be appropriate

Inter-generational success

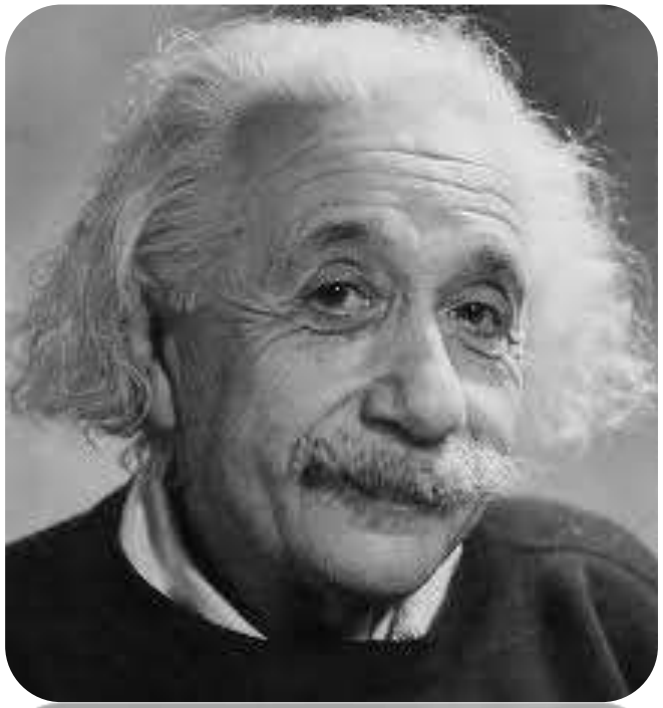
- Some mitigation objectives could be decades in the making
    - Bat corridors or maternity roosts
    - Functional mature podocarp forest
- Post-consent – who does the work, who pays?
- What happens if mitigation hasn’t worked?
- Bonds?

Final thoughts

- Early engagement of these communities
- Iwi, community ownership

- Foundation for the Future

Mitigation - Dealing with complexity……



- *"Make everything as simple as possible, but not simpler*."

- Albert Einstein (1879-1955)

i.e. identify SMART measures to represent key ecosystems & biodiversity values