

Visions / Goals / Objectives

- What is it you are wanting to achieve?
- What are your key objectives? For example:
 - Habitat creation;
 - Ecological restoration;
 - Improving water quality;
 - Providing cultural harvesting opportunities;
 - Providing a recreational opportunity.

Wildlands

Key Features / Physical Attributes Required

- What hydrological, landform, and vegetative features need to be created, enhanced, or maintained?
- If the primary goal is habitat creation/enhancement – habitat for what? For example:

<i>A threatened plant species such as Amphibromus fluitans ⇒ ephemeral freshwater conditions, limited presence of competitive species.</i>	<i>Dabbling ducks such as mallards, grey duck, and shoveler ⇒ shallow, open water, gently shelving margins, extensive edge, marginal cover.</i>
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Wildlands

Key Features / Physical Attributes Required (cont.)

- If the primary goal is **ecological restoration** - what is the reference point, and what are the **specific** features that would have characterised it then?

For example:

A saltmarsh and freshwater-estuarine sequence representative of what occurred in the vicinity of streams discharging into the Tauranga Harbour prior to drainage and development in the early 1900s ⇒ kahikatea and swamp maire swamp forests → flaxlands and reedlands → sea rush and marsh ribbonwood → mangroves; vegetation patterns determined by soil and water salinities, frequency and duration of inundation, soil textures, and elevation/topography.



Current Situation

- What are the present day features of the site?
 - Landforms and ground levels, soils;
 - Hydrology – sources of water, quantity and quality, water levels, ground water, artificial structures;
 - Vegetation – plant communities, indigenous species, invasive plants, threatened species;
 - Habitat values for fauna;
 - Stock and animal pests;
 - Cultural features;
 - Other party interests, e.g. water abstraction, planning authorities.
- What is the history of the site?
- What existing information is available / what investigations are required?



Useful Investigative Tools

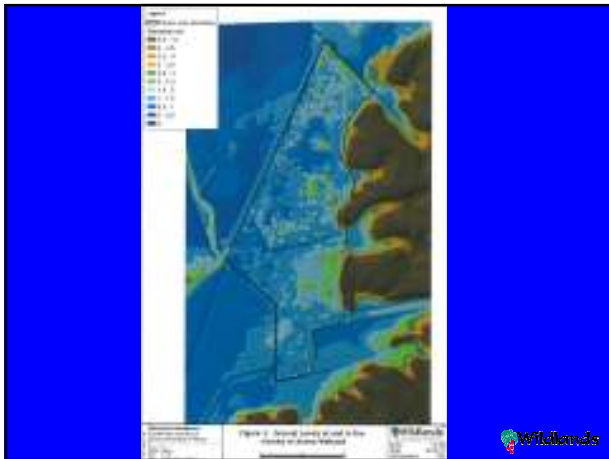
- To map and quantify vegetation and landform, and hydrological features?
 - Aerial photos (including google earth), GIS capability.
- To characterise topography and bathymetry?
 - Dumpy level / spot height surveys;
 - LIDAR data.
- To investigate hydrology?
 - Tape measure and spade;
 - Vegetation indicators;
 - 'Tide marks';
 - Staff gauges, piezometers, flow gauges.



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- ## Issues, Constraints, and Guiding Principles
- What specific issues need to be addressed? For example:
 - Hydrological;
 - Fish passage;
 - Invasive plant species;
 - Interests of adjoining landowners;
 - Regulatory authorities.
 - Other constraints. For example:
 - Costs/resource limitations.
 - Guiding principles. For example:
 - Enhancement strategy needs to be practical, achievable, cost effective, and sustainable.

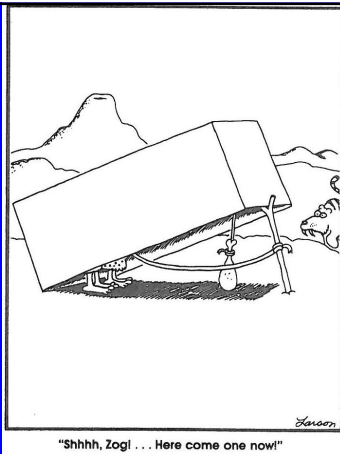
- ## Implementation Strategy
- What works need to be undertaken, and in what order? For example:
 - What weeds need to be controlled or removed?
 - What, if any, earthworks are required?
 - Are structures such as weirs or bunds needed?
 - What provisions need to be made for fish passage?
 - At what stage should water be introduced?
 - How should stock be managed?
 - What planting will be needed?
 - What ongoing management will be required?
 - Maintenance and monitoring regimes?

Methods

- What are the most appropriate methods/best management practices to use? For example:
 - Willow Removal:
 - Aerial vs ground spraying;
 - Windrow/stockpile, mulch, or leave *in situ*.
 - Revegetating Site:
 - Natural regeneration vs planting;
 - Spot spray vs blanket spray;
 - Size and spacing of plants.



Wetland Project Planning



"Shhhh, Zog! ... Here come one now!"



Common Causes for Failing to Achieve Desired Outcomes

- Inappropriate strategy, particularly timing.
- Inappropriate or poorly executed technique.
- Inadequate resourcing.



A Few Examples ...

- **Strategy/timing:**
 - Removing weeds prior to having a plan in place for enhancing water levels or revegetating cleared areas;
 - Enhancing water levels prior to removing weeds;
 - Introducing sediment laden water without a sediment control plan;
 - Removing weeds without addressing risks of reinvasion from other sources;
 - Removing weeds without provisions for follow up control;



A Few Examples (cont.)

- **Strategy/timing:**
 - Impacts on habitats of valued flora and fauna of instantaneous/ total removal of weed cover;
 - Mechanical clearance of weeds and disposal locally without killing weed first and/ or having a follow up plan in place;
 - Removing stock too soon;
 - Aerial boom spraying vs aerial spot spraying vs ground control operations;
 - Killing large trees *in situ* vs felling;
 - Blanket spraying vs spot spraying vs screening at time of planting.



A Few Examples (cont.)

- **Technique:**
 - Incorrect installation of structures such as dams, bunds and overflow facilities;
 - Incorrect weed control e.g. felling willow or other coppicing species without applying an appropriate herbicide to the stump; swabbing the stump but allowing the cut ends of the trunk or branches to make contact with the substrate; or if drilling and poisoning stems *in situ*, holes of insufficient depth or spacing.



Keys to Success

- Good, i.e. adequate, planning.
- Know what it is you want to achieve.
- Develop a good understanding of existing features and underlying processes.
- Consider all options before formulating your implementation strategy and implement best management practice.
- Ensure you have adequate resourcing.
- Involve the right people in your team.

