

LEVEL Intermediate

PEOPLE 2

BUDGET \$

WHEN Summer

REPEAT Every year

## MODULE 5

# WEED SURVEY

### IN A NUTSHELL

- Regular surveillance along tracks, edges, open areas to look for and record weeds
- Use of GPS to accurately record weed presence
- Combine with 'WOF' Perimeter Walk and Vegetation Plots for extra data
- INDICATORS MEASURED: Type, location, density of weed species, presence of seedlings/ new infestations



# WETmak

WETLANDS MONITORING  
AND ASSESSMENT KIT

Weeds are one of the major issues wetland restoration groups tackle. Regular weed surveys allow you to find, and keep on top of them. Use GPS to make it easy for the control team to locate your infestations, and for follow up visits to ensure weeds haven't re-established.

There are different methods depending on your needs (objectives) and risks. If your biggest risk is spending money on weed control unnecessarily, you may wish to monitor plots for a few years to see if/which weeds are spreading. Use the VEGETATION PLOTS module in this kit. If the biggest risk is spending money eradicating serious weeds that you let 'get away' then you should focus on weed surveillance using the methods in this module.

The time and effort required will depend on your wetland size and ease of access.

### Equipment checklist

- Standard safety gear
- Site map including of previous infestations
- WEED DATASHEET
- Weed ID books
- Pencils
- Clipboard
- Digital camera
- Charged camera batteries
- Spare camera batteries
- Memory card and spare card
- Compass
- GPS unit, batteries and manufacturer's instructions
- Binoculars
- Black plastic weed bag
- Sample bag
- Permanent marker

### Skills needed

- Plant identification
- Field navigation
- GPS use



## 1. Plan your approach

### 1.1 Find out what's already been done

Ask your regional council and Department of Conservation if they already monitor weeds at your site. Or if they have any species records or other data from previous surveys that would help you establish a baseline. Ask what are generally the most important wetland weed species to monitor in your area, because you will likely have to prioritise and ignore non-threatening weeds like small annual herbs.

### 1.2 Learn your weeds

If you don't have a keen botanist on your team, see if your regional council, local Botanical Society, National Wetland Trust member, Forest and Bird Society, DOC office or University, has anyone willing to help. They may:

- provide resources to help you identify weeds
- join you in the field for each survey or once to teach you the threatening weeds in your site
- help you build a photo and/or pressed sample file of weeds in your site
- identify samples you bring back from the field

Make sure you know that what you are recording or controlling is a weed, not a native look-alike. Some examples of easily confused species are the native bindweed (*Calystegia*) species, the threatened native water milfoil (*Myriophyllum robustum*), umbrella sedge (*Cyperus*), species of *Juncus* rush, and the native swamp millet grass. Seek advice from a knowledgeable botanist before contemplating any control.

### 1.3 Complete a monitoring plan

If this is the first time you are doing weed monitoring, complete the WETLAND MONITORING MINI PLAN. If not, check the mini plan to ensure you are following the plan actions. Some aspects of the mini plan may need to be completed during a site visit.

### 1.4 Check your equipment

Have all the equipment on the list? Camera working ok? Batteries charged up? Plenty of space on the memory stick? Got a field buddy and permission from any landowners for access? Boots and clothing free of seeds and dirt?

### 1.5 Plan your route

For small, narrow wetlands focus on the perimeter and tracks – it's where many weeds first enter a wetland, you'll minimise damage, and it's safer. Use good binoculars to see further into the wetland from tracks and from high points. In larger wetlands, focus on tracks and edges, open areas (e.g. pond/stream edges), and clearings (e.g. after a fire or major flood). You may also need to establish some transects (marked but untracked routes across the wetland). Use a recent aerial photo to find large canopy weeds like willow and alder.

#### TOP TIP:

**The act of searching for weeds may actually cause them to spread! Keep your clothes and boots clean of mud and seeds. Minimise trampling damage – weeds love to establish on bare areas.**



## 2. Collect data in the field

Tell a 'minder' where you are going, who with, and when you expect to be finished, call or visit them when you finish so they know you are safe. Mark your wetland entry point on your GPS unit in case you lose your bearings.

You will walk the predetermined route looking for target weed species. Use the GPS 'track' function to record the route followed or search area covered (this tells you how much of the wetland you have covered, including where you haven't encountered weed species). Build a species list as you walk. Record infestations by creating a waypoint. It's easiest to use the waypoint number automatically allocated by the GPS unit and write the relevant information on a record sheet.

### 2.1 Set up GPS

Set the GPS to record co-ordinates in NZTM format (follow the instruction manual for your model).

### 2.2 Record target weeds

There are three options depending on whether the target weeds are individuals, contained patches, or widespread over the wetland. Each is recorded on the same WEED DATASHEET, although you may wish to list widespread species on a separate page. Clearly distinguish the three options by always listing patches in the x by x format, and widespread species by the % symbol.

- i Where target weeds are **sporadic individuals** that can be counted, such as a few alder plants and scattered gorse plants at the wetland edge, write their co-ordinates or GPS waypoints and the number of individuals on the WEED DATASHEET. Put each species on a separate line. Add a new waypoint where there is a gap of > 10 m between plants of the same species.
- ii For **suckering or spreading species**, like *Glyceria* or blackberry, note the area of the infestation in metres by metres. If they are too big to estimate, create a waypoint at the first corners. As you reach the far end, use the 'Find waypoint' feature, and select 'Go To' the first waypoint – the GPS will display how far away the first edge of the infestation is, allowing you to estimate the patch size. Record the patch size, e.g. 10x2 m, on the WEED DATASHEET. Use this format to distinguish from the number of plants.
- iii For **widespread species** that are present across a large area of the wetland – too many to count or waypoint them all - record the waypoint at which they were first encountered and note the approximate % of the site over which they are spread, along with the relative density of infestation (dominant, common, scattered). E.g. Grey willow 50 %D and 50% S to indicate grey willow forms a solid canopy over half of the wetland and is scattered over the other half. You may not know until you have traversed the wetland if a species is sporadic or widespread, and may have to alter the WEED DATASHEET accordingly.



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### 2.3 Photograph it

Take photos of each infestation, including clear close up shots of flowers/ seed heads, seeds, and leaves. Not only is it handy for double checking your identification, but you can give the photo of the actual target plant to the control team. Photographs are also a useful record of an infestation (e.g. on a bluff or quarry face) – take a photo and record location, direction, and photo number in the site sheet notes field.

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### 2.4 Collect it

Collect samples for species of uncertain identification, but only if there is plenty of plant matter to ensure you didn't remove the last colony of a rare species! For smaller plants collect an entire plant that has fruit/flowers/seeds, include roots. For trees take a small branch that has several leaves, not just one leaf and include flowers/fruit. Also take general and close up photographs and record the waypoint and general details about its height, growth form, colour etc.

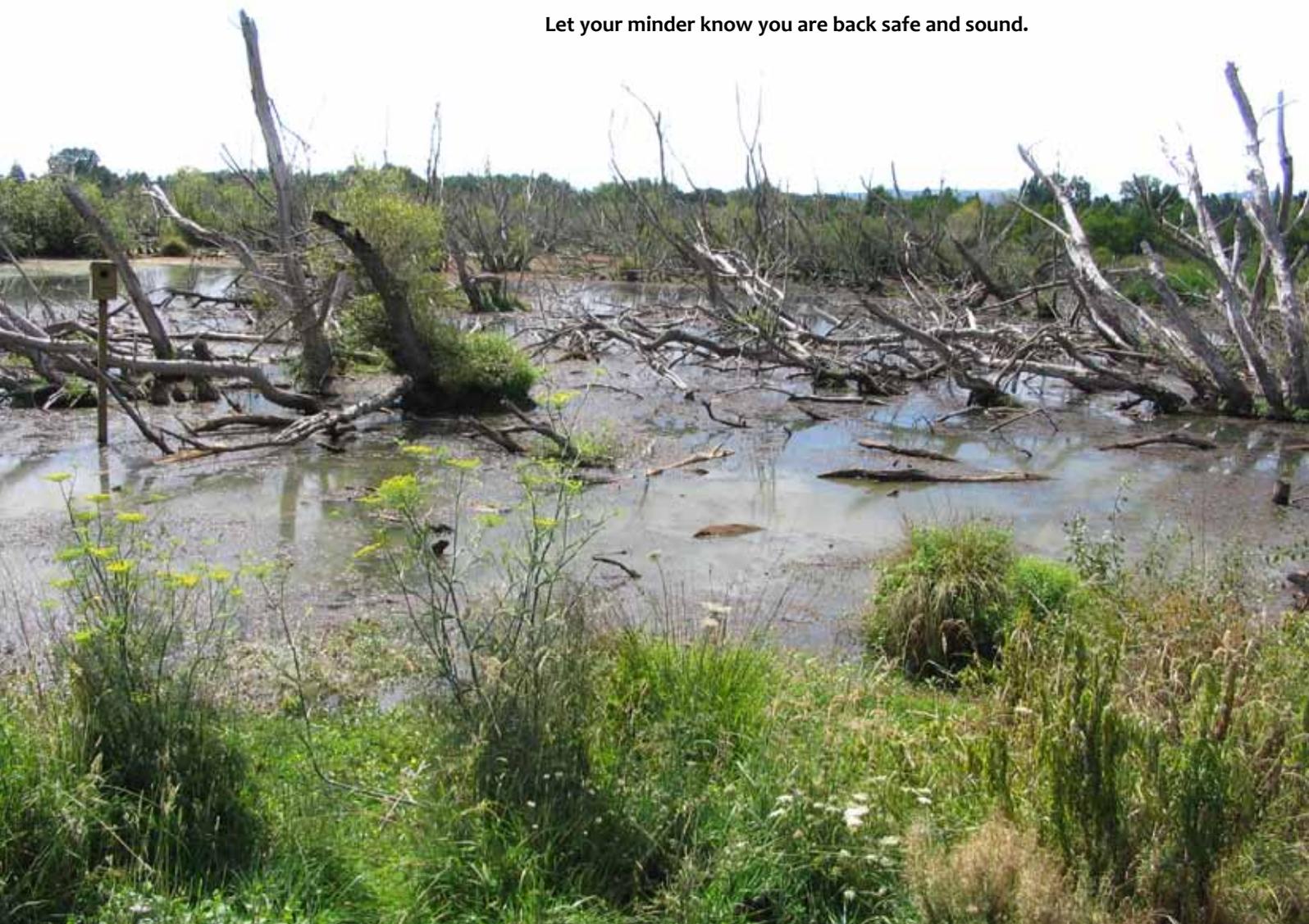
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### 2.5 Remove it

If you encounter a small, easily controlled infestation of a very invasive species, and are very confident in your identification, it makes sense to remove it, as long as you are certain you can hand pull it without causing further spread. Double bag it securely in black plastic and dispose of to landfill. Record the infestation as per normal, but write in the notes that you removed it – it's important to be able to re-visit the site to ensure it hasn't re-established.

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**Let your minder know you are back safe and sound.**



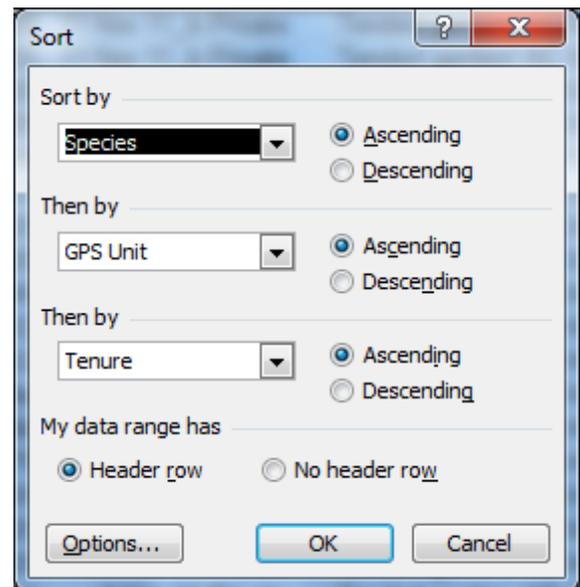
## 3. Back at base

### 3.1 Store the data

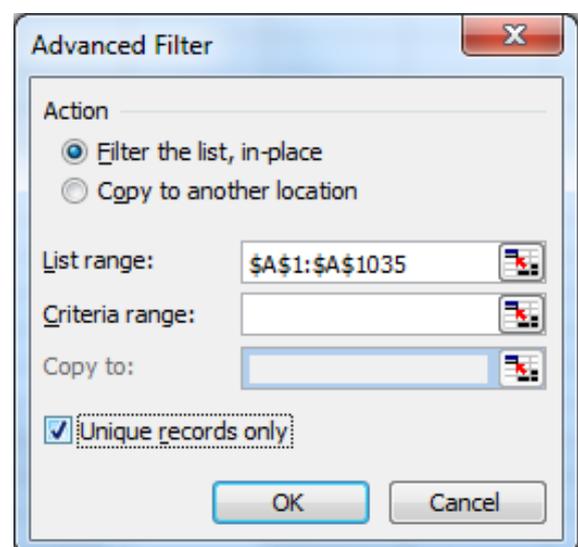
- Download photos and GPS data files at the first opportunity and save onto a hard drive (internal or external), with backups on DVD/CD stored in a different location to the originals.
- Store photos in folders bearing the site name, module and year. If you have used the camera's pre-set photo number on your datasheet, don't rename the file. Right click on an image file and select 'Properties' if you want to confirm the time and date a shot was taken.
- Have the GPS data saved as a kml or kmz file so they can be opened in Google Earth or Google Maps. Double check that they are in the right location on the map/aerial photo. You can load photos and waypoints onto Google Earth, positioning the image at its actual location.
- Enter the data from the data sheets into an excel spreadsheet. Take great care not to introduce errors.
- Print out a copy of the spreadsheet and put in a folder divided into relevant year. Ideally the folder will also contain this module's mini plan, reports, printed maps, directions to the weed survey lines and other relevant monitoring data, along with CDs/ DVDs and notes on where the hard drive copies are stored.

### 3.2 Analyse and interpret the data

- Make a copy of the spreadsheet.
- Sort the data by 'Species' using the Sort option under the Data tab.



- Copy the species column to another worksheet and use the Advanced Filter option under the Data tab, making sure to tick the 'unique records only' box. Then copy the whole column and paste into a word document, creating a list of all the species recorded from your survey.



- Keep records of control efforts for the waypoints of targeted weeds, add them to a new column in the spreadsheet.
- Add a 'Status' column for each year to indicate if a species that was previously recorded has 'Gone', 'Spread', 'Died' etc since the previous monitoring period.
- If you have data from previous visits, look for changes in the extent and status of weed species over time.
  - *Are they being reduced in area, or continuing to expand?*
  - *Are new weed species arriving at the site?*
  - *Is the number of weed species increasing over time?*
  - *What is the total area or level of infestation by higher priority weeds?*
- Interpret your findings, e.g.
  - *Are species not previously recorded new arrivals or overlooked first time?*
  - *Are species not recorded this time indicating possible decline in a species, successful weed control, or were they overlooked or mis-identified on one of the visits?*

You can create simple graphs to show change over time, e.g. in total number of native species.

### 3.3 Report the data

Complete the REPORT TEMPLATE and share the results with your staff/ volunteers, and if appropriate, funders/ supporters and management agencies. Put a printout in your monitoring folder and save a copy with your other monitoring files on your website / computer.

Include the following:

- Number of weed species present
- Species most frequently encountered
- Species forming the greatest extent of infestation
- Extent and frequency of infestations of highly threatening weed species
- Species present only as seedlings (indicating potential new incursion)
- Area affected by weeds
- Percentage of project area affected by weeds
- Percentage of project area affected by a particular weed species.
- Reference to, or a summary of, weed control undertaken during the monitoring period.

Compare the results with your restoration plan – does it need any changes to deal with new or reduced threats?

### 3.4 Subsequent visits

- Take a GPS unit with the waypoints of the previous survey and use it to follow the same route. Write the new data relevant to each waypoint, including if there is no sign of that species at that waypoint (remember that waypoints may be plus or minus 3-5 m). If a species is not seen within 10 m of a waypoint where they were previously recorded write 'Gone' in the Infestation column.
- Add new waypoints and associated information if you find new infestations.
- To keep on top of weeds it is best to repeat the weed survey yearly, at the same time of year, usually in summer when plants are fruiting/ seeding to help with identification.



Completed example: (blank word version also available from NZ Landcare Trust website)

# Weed Survey Datasheet

SITE NAME: *Waïora Lagoon*  
 LOCATION: *Off Waïora Lagoon Rd, 10 km south of Onetaha.  
 E1783653 N5989582*  
 RECORDER: *Sandi Beech* DATE: *07 March 2012*  
 START POINT (NZTM): *E1783653 N5989582* GPS TRACK NAME: *Weed7Mar12*

Waypoint or co-ordinates	Species	Infestation <sup>1</sup>	Max Height (m)	Seedlings Y,N, n/a	Notes (incl. photo numbers, habitat e.g. pond edge, if flowering etc)
120	<i>Crack willow</i>	<i>6x30 m</i>	<i>8</i>	<i>no</i>	<i>Narrow (6 m i.e. single tree width) band, starts at this waypoint, runs for 30 m (checked using GOTO this waypoint when reached far end)</i>
120	<i>Blackberry</i>	<i>2x2 m</i>	<i>2</i>	<i>n/a</i>	<i>Single patch near track entrance</i>
121	<i>Blackberry</i>	<i>1x2 m</i>	<i>1</i>	<i>n/a</i>	<i>Second smaller patch of blackberry, about 15 m from first one (at wpt 120)</i>
122	<i>Small leaved privet (lig sin)</i>	<i>2 trees, 10 seedlings</i>	<i>4</i>	<i>yes</i>	<i>Small dry 'island' with 2 privet trees and seedlings</i>
122	<i>Gorse</i>	<i>2 seedlings</i>	<i>0.3</i>	<i>yes</i>	<i>Growing under the privet on island, no adults nearby</i>
122	<i>Pampas</i>	<i>1 clump</i>	<i>1.2</i>	<i>n/a</i>	<i>Growing beside the privet on island - no infl to ID, possibly C. jubata</i>
123	<i>Glyceria maxima</i>	<i>30%D</i>	<i>1.5</i>	<i>n/a</i>	<i>From this waypoint glyceria is the dominant plant over a third of the wetland (visible on aerial photo)</i>

<sup>1</sup> If species occurs sporadically, at each waypoint note either # of plants or area of spread (i.e.. x by x metres) for clump/ sward formers e.g. suckering plants that cannot be counted. Create new waypoint if same species > 10 m away.

OR For widespread species, list the waypoint at which first encountered and note the % of wetland over which it is either:

- Dominant: many large patches > 4 sqm, or dominant component of vegetation
- Common: many small patches, not dominant
- Scattered: thinly scattered plants/small patches

