

Appendix 2

Sampling methods for wetland habitats, features and different wetland-dependent taxa

Note that cost estimates are for equipment, etc., and do not include costs of fees or salaries. Listing of a source of equipment does not imply endorsement of the supplier or the equipment.

Water Quality

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Wetland types	Required expertise	Possibility of collecting?	Equipment needed	Some sources of equipment	Reference sources for methods
physical probes	IW/MC	pH, O ₂ , electric conductivity, temperature, BOD, and flow rate	short- 10 -30 minutes	\$100-3000 depending on number of probes and quality	lakes, rivers, wetlands, all water bodies	none	no	pH probe, temperature probe, DO (dissolved oxygen) probe, conductivity meter, flow meter, BOD collection equipment, titration equipment	http://www.geocities.com/RainForest/Vines/4301/tests.html http://www.hannainst.com/index.cfm	English, Wilkinson and Baker (1997)
Secchi Disc	IW/MC	water transparency	short, 5-10 minutes	\$10	mostly standing water or slow flowing rivers; shallow coastal waters	none	no	secchi disc	http://www.nationalfishingsupply.com/	Wetzel & Likens (1991); English, Wilkinson and Baker (1997)
Water sample collection and Lab analysis	IW/MC	total phosphorus, total nitrogen, chlorophyll-a	10 minutes in field, 3 hours in laboratory per sample	high – laboratory equipment	all water bodies	training in using laboratory equipment	water samples	spectrophotometer, filters, bottles, water samples, net for reactive phytoplankton	http://www.hannainst.com/index.cfm	Wetzel & Likens 1991; Downing & Rigler 1984; Strickland & Parsons 1972
visual assessment of water colour	IW	water colour and type (black, white, clear, etc.), turbidity	fast- 1-5 minutes	0	all water bodies	none	no	water samplers for deeper water (can be used in conjunction with zooplankton sampling)		
visual assessment of sediment	IW/MC	sediment colour and type (organic, sandy clayish, etc)	fast- 1-5 minutes	0	all water bodies	none	sediment sample	grab sampler (can be done in conjunction with benthic invertebrate sampling)	http://www.elcee-inst.com.my/aboutus.htm	English, Wilkinson and Baker, 1997

Wetland habitat types

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Wetland types	Required expertise	Possibility of collecting?	Equipment needed	Some sources of equipment	Reference sources for methods
field habitat assessment	IW/MC	channel morphology, bank characteristics, discharge, velocity, sedimentation, evidence of disturbance, microhabitat structure (riffles etc), riparian attributes, water depth	1-3 hours	low	Any inland or coastal wetland habitats	training in field methods	no	flow meter, tape measure, camera, substrate sampler		www.usgs.gov/nawqa
spatial data analysis		land use, vegetation type and distribution, riparian corridor characteristics, valley morphology, size and shape of water bodies, channel gradient, water colour, hydrologic regime, slope	variable, depending on data resolution and availability	variable- depending on data resolution and availability	all wetland types	knowledge of reading data and GIS	no	satellite imagery, aerial photos, digital elevation models, land cover, hydrography, geology		www.freshwaters.org; www.usgs.gov
Manta board survey		Mapping of lakeshore littoral habitats to complement simultaneous mapping of coastal topography, land form and land use	15 km of shoreline per day by team of 4-5 people	Boat, fuel	Any clear waters generally with depth of 3-10 m depending on water visibility	Can be acquired in 1-2 days	no	Manta board; snorkelling equipment; inflatable boat plus outboard; maps; underwater paper and pencils, GPS	The manta board can easily be constructed from marine ply	www.ltbp.org/PDD1.HTM Allison et al. (2000); Darwall & Tierney (1998); English, Wilkinson & Baker (1997)

Macrophytes (plants)

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Water type	Required expertise	Possibility of collecting ?	Equipment	Some sources of equipment	References for details of methods
visual search	IW/MC	note visible plants within certain areas ie. full river mark, high water mark; for qualitative analysis	variable depending on area searched	\$0	rivers, lakes, ponds, wetlands; any coastal/marine habitat	Species identification	yes	Basic	Everywhere	NSW National Parks and Wildlife Service (2002)
random sampling	IW/MC	qualitative, more unbiased than a visual search	1-5 hours	\$0	rivers, lakes, ponds, wetlands; any coastal/marine habitat	Species identification & knowledge of making random samples	yes	Basic	Everywhere	Downing & Rigler (1984), Moss et al. 2003 in press; NSW National Parks and Wildlife Service (2002)
Plots	MC	All coastal vegetation (plot size variable depending on vegetation type)	Variable: usually c. 1 hour/plot	Low	All coastal habitats, including mangroves	Species identification & survey design	Yes	Basic	Everywhere	NSW National Parks and Wildlife Service (2002)
grab	IW/MC	good, quantitative method	1-5 hours	\$350-1100	rivers, lakes, ponds, wetlands; soft bottom coastal/marine vegetation	Skill in grab use; knowledge on random of transect sampling	yes	Grab sampler, buoys, GPS, boat	http://www.elcee-inst.com.my/aboutus.htm	Downing & Rigler (1984)
Diving/snorke ling	IW/MC	allows investigating plants in deep water	Usually c. 1 hour, depending on repetition	Low (snorkelling) to high (Scuba)	rivers, lakes, ponds, wetlands; clear coastal/marine waters	diving certification	yes	diving equipment, scissors to collect specimens; underwater sheets, slates & pencils	http://www.mares.com	English, Wilkinson & Baker (1997)

Zooplankton (small invertebrates suspended in water)

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Water type	Required expertise*	Possibility of collecting ?	Equipment	Some sources of equipment	References for details of methods
box samplers	IW/MC	for plankton crustaceans and rotifers	1-3 hours	\$100	rivers, lakes, ponds; all coastal/marine waters	skill in using samplers	yes	plankton (box) samplers	http://www.mclanelabs.com	Downing & Rigler (1984)

Epiphytic macroinvertebrates

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Water type	Required expertise	Possibility of collecting ?	Equipment	Some sources of equipment	References for details of methods
various samplers, depending on type of vegetation	IW/MC	Any inland wetland; littoral (near shore) zone	1-4 hours	\$100-\$200/sampler	rivers, lakes, ponds, reservoirs, seagrass and macroalgal beds	skill in sampling	yes	tube or box samplers, sieves		Downing & Rigler (1984); Kornijów & Kairesalo (1994); Kornijów (1997)

Benthic macroinvertebrates

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Water type	Required expertise	Possibility of collecting ?	Equipment	Some sources of equipment	References for details of methods
--------	--	-------------	------------	------	------------	--------------------	-----------------------------	-----------	---------------------------	-----------------------------------

visual search/ snorkel/ dive (quadrats, intercept and band transects)	IW/MC	good for locating big animals (e.g. crustaceans); suitable for suerveying clear waters and medium/large animals	Usually c. 1 hour, but variable depending on extent of repetition	Low (snorkelling) to high (scuba)	rivers, lakes, all clear coastal waters	diving certification	yes	snorkel/scuba gear, dip net, underwater sheets, slates and pencils, collecting material	http://www.nationalfishingsupply.com/seinenets1.html http://www.mares.com	English, Wilkinson & Baker (1997)
grabs, tube samplers	IW/MC	all invertbrates inhabiting soft or sandy sediments	Variable, generally about 1 hour/site	\$350- \$1100	good for sampling soft and sandy sediments	skill in using grab apparatus	yes	Grab samplers, wire mesh sieve, Rose Bengal stain, buoys, boat, sorting box, jars and preservatives	http://www.elcee-inst.com.my/limnology.htm http://www.elcee-inst.com.my/aboutus.htm	Downing & Rigler (1984); English, Wilkinson & Baker (1997)
kick net	IW/MC	all invertebrates inhabiting hard substrates	1-5 hours	\$55	good for wadable streams with gravel or stoney bottom	skill with kick nets	yes	kick net	http://www.acornnaturalists.com/p14008.htm http://www.greatoutdoorprovision.com/	Downing & Rigler (1984) http://www.wavcc.org/wvc/cadre/WaterQWuality/kicknets.htm
dip net	IW/MC	suitable for sampling nectic (swimming) animals (e.g. beetles, water mites) in shallow waters	1-2 hours	\$5-\$20/ net	lakes, rivers, wetlands (incl Coastal)	skill in using dip nets	yes	dip net	http://www.sterlingnets.com/dip_nets.html http://www.seamar.com	Downing & Rigler (1984)
seine	IW	suitable for sampling big invertbrates (crustaceans) in shallow water without strong current	1-4 hours	\$10-\$20/ net	small rivers, possible in lakes with a boat	skill in seining	yes	seine net	http://www.nationalfishingsupply.com/seinenets1.html	Downing & Rigler (1984)
sledge	MC	Semiquantitative epifauna sampling	About 1 hour/site	Not available	Soft-bottom habitats	Skill in sledging	Yes	Sledge, sieves, sorting box, buoys, GPS		English, Wilkinson & Baker (1997)
dredge	MC	Semiquantitative at best: useful for broad area surveys and inventories	About 1 hour/site	\$500-600 per dredge	Soft-bottom: samples deeper into substrate	Skill in dredging	Yes	Dredge, sieves, boat, sorting box, rope, GPS	http://wildco.com	English, Wilkinson & Baker (1997)

trawl	MC	Qualitative: larger epifauna and demersal nekton (complementary to other methods)	2-3 hours/site	\$1000 for nets, boat rental and field assistance	Soft-bottom substrates	Skill in trawling	Yes	Trawl, sieves, boat, sorting box, rope, GPS	http://www.seamar.com	English, Wilkinson & Baker (1997)
Surber sampler	IW/MC	all invertebrates inhabiting stony or gravel substrates	1-3 hours	\$200	gravel or stony bottom rivers and streams, standing waters	knowledge of using Surber and requirements to quantify data	yes	Surber sampler, bucket	http://www.kc-denmark.dk/public_html/surber.htm http://www.kc-denmark.dk	Downing & Rigler (1984)
aerial nets		for catching adult invertebrates	1-5 hours	\$35-\$50	land	skill in using aerial nets	yes	insect net	http://www.rth.org/entomol/insect_collecting_supplies.html http://bioquip.com/	Downing & Rigler (1984)

Fishes

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Water type	Required expertise	Possibility of collecting ?	Equipment	Some sources of equipment	References for details of methods
seine nets		mostly smaller fishes	1-4 hours	\$10-250/ net, depending on size	shallow water without strong current, small rivers, possible in lakes with a boat, (for big nets a boat can be needed for deployment and pulling)	skill in seining	yes, net does not kill fishes	seine net boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.nationalfishingsupply.com/seinenets1.html http://www.seamar.com	Bagenal (1978); English, Wilkinson and Baker (1997)
gill net	IW	all fish sizes and types	24 hours- leave out overnight	\$150-200/net	shallow to medium depth waters, standing waters or slow flowing rivers	none	yes, net kills fishes	gill nets	http://www.nationalfishingsupply.com/seinenets1.html ¹	Bagenal 1978

Kill nets	MC	all fish sizes and types, depending on mesh size	12-24 hours- leave out overnight	\$50-\$500/net	shallow to medium depth waters	Skill in setting the nets	yes	drift, trammel, block, encircling and/or gill nets, boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.seamar.com	English, Wilkinson and Baker (1997)
fish traps (fykes)	IW/MC	all fish sizes and types, mostly bottom living fishes	24 hours- leave out overnight	\$50-100/trap	mostly shallow waters (for deeper waters a motorised winch is needed)	Skill on setting traps in right places. Fishermen assistance advised	yes, trap does not kill fishes	fish traps, (may need motorized winch), boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.seamar.com	Bagenal (1978); English, Wilkinson and Baker (1997)
Trap nets	MC	Most fish sizes and types, primarily in shallow waters	12-24 hours, based on tides (barrier and bag) Corrals are set up for longer and collect every 24 hours or so	\$50-\$500/nets, corral depending on size	shallow waters	Skill in setting the nets. Corral requires expert people (fishermen)	yes	Barrier, bag nets and/or fish corral, boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.seamar.com	English, Wilkinson and Baker (1997)
Trawl (various types: e.g. beam, Otter)	IW/MC	use only for deep water pelagic, schooling and bottom-dwelling fish, can be very destructive to the environment	1-4 hours	\$1000 for nets, boat rental and field assistance	only for deeper, large waters without obstacles on the bottom or surface debris	skill in trawling	yes, nets kill fishes	trawl net, boat, at least 2-3 people to help measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.fao.org/fiservlet/org.fao.fi.common.FiRefServlet?ds=geartype&fid=103 http://www.seamar.com	Bagenal 1978 English, Wilkinson and Baker (1997)
Scoop and tray nets	MC	suitable for small fish near surface, use only against banks	1-5 hours	\$5-\$20/ net	Used in inaccessible areas, such as mangroves	Skill in using the nets but easy to learn	yes	Scoop and tray net, boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.seamar.com	English, Wilkinson and Baker (1997)
Push net	MC	Catches only small organism	1-2 hours	\$5-\$20/ net	Most shallow waters	Skill in using the nets - but easy to learn	yes	Push net, boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.seamar.com	English, Wilkinson and Baker (1997)
Cast net	MC	Suitable for small fish and prawns	1-2 hours	\$50-\$200/net	Good for confined areas and shallow waters	Skill on cast. Operators vary in efficiency.	yes	Cast net, boat, measuring boards, scales, sheets, pencils, slates, plastic bags,	http://www.nationalfishingsupply.com/	English, Wilkinson and Baker (1997)

								plastic labels, preservative, GPS		
Drop net	MC	Small organisms	1-2 hours	\$50-\$100/net	Good for small and shallow areas	Skills on construct and use. Labour intensive	yes	Drop net, boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.seamar.com	English, Wilkinson and Baker (1997)
Lift net	MC	Small and rare species that must be concentrated	1-2 hours	\$50-\$100/net	Good for small and shallow areas	Skills on use the net	yes	Lift net, boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.seamar.com	English, Wilkinson and Baker (1997)
Spear fishing (various types)	MC	Suitable for all species but used primarily for big and selective species (difficult to catch by other means)	1-6 hours	\$50-\$200/spear gun	Any clear waters; difficult areas	Skill is obtained by practicing	Yes	Spear gun and gear, boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://divebooty.com	English, Wilkinson and Baker (1997)
Longline (drift or bottom)	MC	Selective fish, according to bait used	12-24 hours - leave out overnight	\$100-\$300/per line, depending of number of hooks	Any water, except high-relief hard bottom	Skill in long-lining	Yes	hook, line, bait, buoys, weights, boat, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.seamar.com	English, Wilkinson and Baker (1997)
dip nets	IW/MC	suitable for small fish near surface	1-5 hours	\$5-\$20/ net	limited area within rivers, lakes, other wetlands	skill in using dip nets	yes	dip net	http://www.sterlingnets.com/dip_nets.html	Bagenal 1978
hook and line	IW/MC	suitable for any fish type and any water, depending on bait used	variable depending on repetition	variable depending on repetition	rivers, lakes, other wetlands	skill in line fishing	yes	hook, line, bait, (boat), measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://www.nationalfishingsupply.com/	
Rotenone	MC	All fish of the encircle area. Kills all the fish. Permit could be required	Minutes per site	\$350/20 litres	Encircle area with a net in shallow-open area. For deep waters, use it in caves and crevices	Skill on setting net	Yes	Rotenone, net, scoop net, measuring boards, scales, sheets, pencils, slates, plastic bags, plastic labels, preservative, GPS	http://southernaquaculturesupply.com/index.php	English, Wilkinson and Baker (1997)

sonars	IW/MC	suitable for schooling, pelagic fish, not very precise data	depending on the size of the water body	\$100 - 1000	deep lakes and large rivers; all coastal waters, but mostly deep	skill in operating the sonars	No	Sonar, boat		
electrofishing	IW	optimal for sampling medium to big fish, better in colder water with some salinity	1-5 hours, variable depending on repetition and habitat type	\$500-2000	mostly shallow waters	training in electrofishing and license	yes, stuns fishes but does not kill them	electro-shocker set; collecting equipment	http://www.fisheriesmanagement.co.uk/electrofishing.htm	Bagenal 1978
dive/snorkelling (transects, stationary, roving)	IW/MC	suitable for surveying particular ecosystems that are difficult to locate or reach; clear waters	usually about 1 hr., but variable depending on repetition	low (□ snorkelling) to high (scuba), cost of equipment	lakes, rivers, all coastal clear waters	Snorkelling: none; diving needs certification. Identification of species and survey design	no	snorkel/scuba gear, dip net, underwater sheets, pencils and slates	http://www.mares.com	English, Wilkinson and Baker (1997)
questionnaire	IW/MC	ask local fishermen about the fishes they have observed and use	2-4 hours	low	all water bodies	Easy to apply but requires knowledge to prepare questionnaire	no	paper, pens, maybe refreshments for locals		

¹ The so-called “biological survey gill nets” can be ordered from: Fårup SpecialnetKaustrupvej 3Velling6950 Ringkøbing Denmark or from: Lundgren Fiskefabrik A/BStorkyrkobrinken 12S-11128 Stockholm, Sweden Tel +45 97 32 32 31

Reptiles and Amphibians

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Water type	Required expertise	Possibility of collecting ?	Equipment	Some sources of equipment	References for details of methods
dip nets (amphibians)	IW/MC	suitable for catching tadpoles	usually about 1 hour, but variable depending on repetition	\$5-\$20/ net	rivers, lakes, other inland wetlands, any coastal waters where species occur	skill in using dip nets	yes	dip net	http://www.sterlingnets.com/dip_nets.html http://www.seamar.com	NSW National Parks and Wildlife Service (2002)

visual search (ambphibians/reptiles)	IW/MC	good for locating relatively visible organisms	variable	\$0	land and surface water	knowledge of microhabitats	no	None		NSW National Parks and Wildlife Service (2002)
vocalizations	IW/MC	listen for and sometimes record frog calls and identify species from call	variable, several hours depending on search and record time	low- tape recorder	any water bodies, riparian habitats, land	knowledge of frog calls and identify species from calls, habitats	no	tape recorder, cassettes, playback, flashlights,	Any good electronic shop	NSW National Parks and Wildlife Service (2002)
pitfall traps with drift fence (amphibians/reptiles)	IW/MC	good for collecting animals that are difficult to sight; estimate relative abundance and richness	should be left out 24-48 hours	\$0 if old buckets are used	land	skill in setting up pitfall traps with drift fences	yes	buckets, hand shovel, metal for fence,	http://www.agric.nsw.gov.au/reader/2730	NSW National Parks and Wildlife Service (2002)
litter search (amphibians/reptiles)	IW/MC	usually used for finding frogs in conjunction with quadrants	variable depending on repetition	\$0	land	minimal	yes		Everywhere	NSW National Parks and Wildlife Service (2002)
transects (amphibians/reptiles)	IW/MC	used to control sample area to quantify and standardize data	dependant on length and number of transects	\$0	Land	knowledge of establishing transects	yes	marking tape	http://www.npws.nsw.gov.au/wildlife/cbsm.html	NSW National Parks and Wildlife Service (2002)
Snorkelling/dive (reptiles)	IW/MC	used especially for looking for turtles	variable depending on repetition	low (snorkelling) to high (scuba)	rivers, lakes any coastal waters	diving certification	yes	snorkel/scuba gear, dip net, underwater sheets, slates and pencils	http://www.mares.com	NSW National Parks and Wildlife Service (2002)
nooses (reptiles)	IW/MC	suitable for lizards	depends on number of lizards sought	\$0 - can be made of grass	land	skill in making noose and spotting lizards	yes	long, flexible, but strong weed/ rope,	http://www.macnstuff.com/mcfl/1/lizard.html	NSW National Parks and Wildlife Service (2002)
turtle traps (reptiles)	IW/MC	used to trap turtles on land and water	at least 1 day	\$65-\$150/ trap	lakes, rivers, land, other inland and coastal wetlands	knowledge of setting turtle traps	yes	turtle trap, bait		Limpus et al. (2002); NSW National Parks and Wildlife Service (2002)
questionnaire	IW/MC	ask local people, incl. fishermen about the species they have observed and use	2-4 hours	low	all water bodies	Easy to apply, but requires experience in questionnaire design	no	paper, pens, maybe refreshments for local people		NSW National Parks and Wildlife Service (2002)

Birds

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Water type	Required expertise	Possibility of collecting ?	Equipment	Some sources of equipment	References for details of methods
airplane surveys	IW/MC	can get crude estimates of population numbers and relative population abundance; biased against certain species	1-4 hours	high- cost of hiring an airplane	any open areas; may also be only means for surveying densely vegetated wetlands	experience in quickly recognizing species	no	if possible, fly at height enabling naked eye identification; binoculars, tape recorder, maps, GPS gear	http://www.telescope.com	NSW National Parks and Wildlife Service (2002)
point counts	IW/MC	Terrestrial species: used in conjunction with transects to control sample area to quantify and standardize data - can be done on foot in dry season and canoe in wet season	1-5 hours	\$100	land, rivers, wetlands; all coastal habitats	knowledge of parameters for carrying out and recording point counts	no	binoculars, measuring tape, flagging	NSW National Parks and Wildlife Service (2002)	http://www.npws.nsw.gov.au/wildlife/cbsm.html ; NSW National Parks and Wildlife Service (2002)
transects	IW/MC	Terrestrial & aquatic species: used to control sample area to quantify and standardise data – can be done on foot or by boat	1-5 hours, but depends on sampling area	\$100	Any open habitat	Knowledge of the species and of survey design		Binoculars, measuring tape	NSW National Parks and Wildlife Service (2002)	NSW National Parks and Wildlife Service (2002)
vocalizations	IW/MC	listen for and sometimes record bird calls and identify species from call	variable, several hours depending on search and record time	low- tape recorder (if needed)	any water bodies, riparian habitats, land; coastal habitats	knowledge of how to identify bird species from calls, habitats	no	tape recorder, cassettes, playback (if needed)g	Any good electronics shop	NSW National Parks and Wildlife Service (2002)

locate nesting sites	IW/MC	bird species nesting on or near water	1-5 hours	\$100	any water bodies	knowledge of nesting habitats and nesting ecology (to avoid disturbance)	no	binoculars, maps	http://www.telescope.com	NSW National Parks and Wildlife Service (2002)
----------------------	-------	---------------------------------------	-----------	-------	------------------	--	----	------------------	---	--

Mammals

Method	Applies to inland waters (IW) and/or marine/coastal (MC)	Application	Field Time	Cost	Water type	Required expertise*	Possibility of collecting ?	Equipment	Some sources of equipment	References for details of methods
sighting	IW/MC	look for mammals to surface	variable	\$0	rivers, lakes, wetlands; all coastal/marine habitats	minimal	no	binoculars if necessary	http://www.telescope.com	NSW National Parks and Wildlife Service (2002)
locate breeding sites	IW/MC	appropriate for aquatic mammals living also on land	1-5 hours	\$0	land	knowledge of breeding habitats	yes	None		
Traps	IW/MC	small and medium sized mammals (e.g. otters, minks)	12 hours- leave out overnight	\$20-50/trap	land, riparian, shallow water; all coastal habitats	Trap-setting and locating skill	yes, trap does not kill animals	Tomahawk trap, Sherman traps	http://www.thecatnetwork.org/trapping.html	NSW National Parks and Wildlife Service (2002)
Tracks	IW/MC	detecting mammal presence on land, riparian	1-4 hours- depends on search time	\$0	land and riparian areas	able to detect tracks and identify species from tracks	no	minimal- take photo or make plaster cast	Any camera supplier	NSW National Parks and Wildlife Service (2002)
transects	IW/MC	quantifies data if there are many sightings	1-5 hours	\$0	river, lakes, wetlands; open coastal habitats	knowledge of establishing transects	no	binoculars if necessary	http://www.telescope.com	http://www.npws.nsw.gov.au/wildlife/cbsm.html
Airplane surveys	MC	Crude estimates of population numbers and relative population abundance biased	1-2 hours, but depends on size of survey area	High – airplane hire cost	All open areas	Experience in quickly identifying species	No	Binoculars	http://www.telescope.com	NSW National Parks and Wildlife Service (2002)

		against certain species)								
--	--	--------------------------	--	--	--	--	--	--	--	--