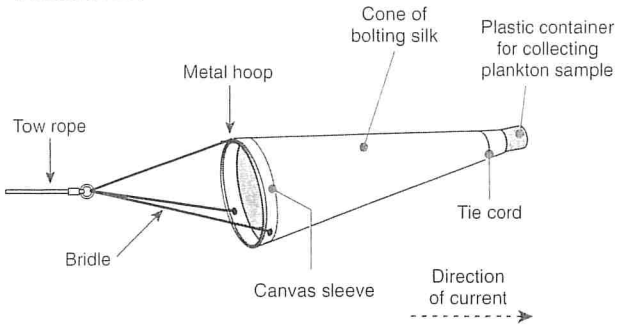
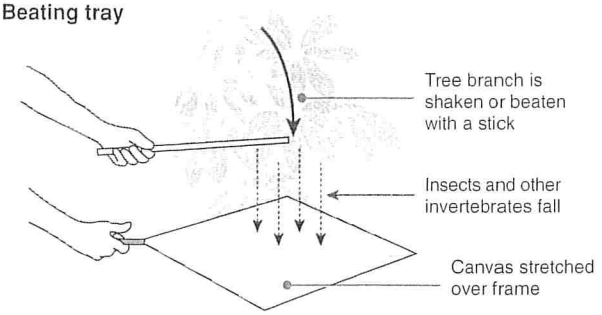
Sampling Animal Populations

Unlike plants, most animals are highly mobile and present special challenges in terms of sampling them **quantitatively** to estimate their distribution and abundance. The equipment available for sampling animals ranges from various types of nets and traps (below), to more complex electronic devices, such as those used for radio-tracking large mobile species.

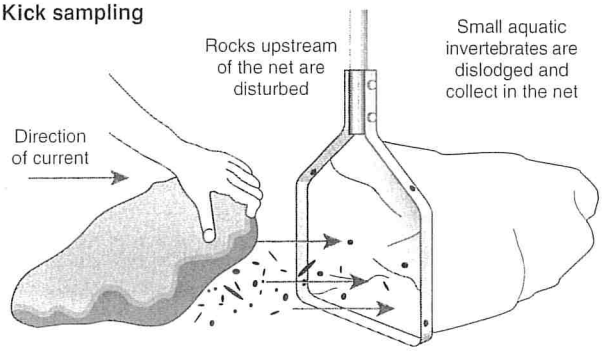
Plankton net



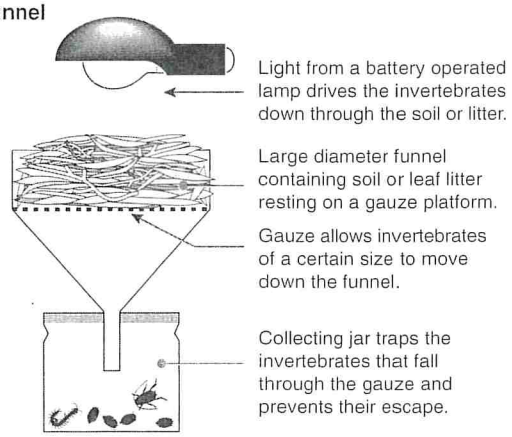
Beating tray



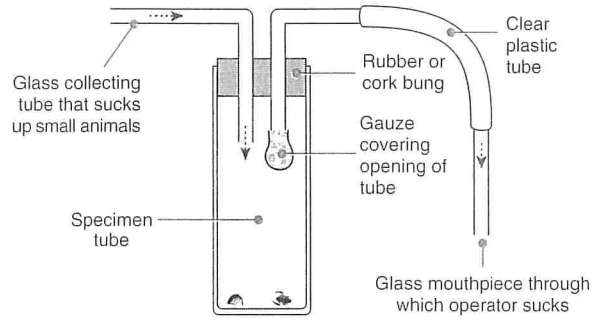
Kick sampling



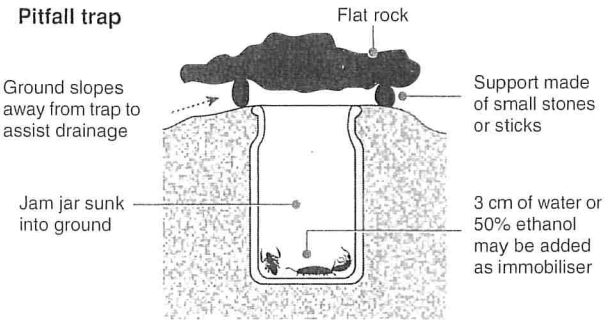
Tullgren funnel



Pooter (aspirator)



Pitfall trap



1. Describe which of the sampling techniques pictured above provides the best quantitative method for sampling invertebrates in vegetation. Explain your answer:

_____

_____

_____

_____

2. Explain why pitfall traps are not recommended for estimates of population density: _____

_____

_____

3. (a) Explain how mesh size could influence the sampling efficiency of a plankton net: _____

_____

(b) Explain how this would affect your choice of mesh size when sampling animals in a pond: _____

_____

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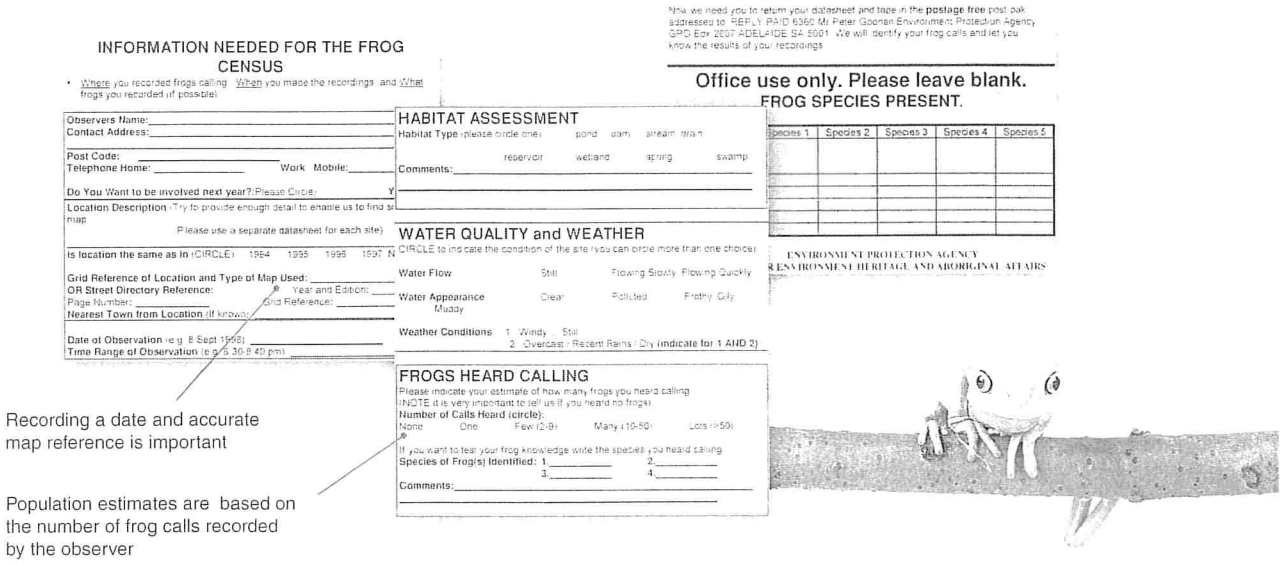
Related activities: Mark & Recapture Sampling, Sampling a Leaf Litter Population

Indirect Sampling

If populations are small and easily recognized they may be monitored directly quite easily. However, direct measurement of elusive, easily disturbed, or widely dispersed populations is not always feasible. In these cases, indirect methods can be used to assess population abundance, provide information on habitat use and range, and enable biologists to link habitat quality to species presence or absence. Indirect sampling methods provide less reliable measures of abundance than direct sampling methods, such as mark and recapture, but are widely used nevertheless. They rely on recording the signs of a species, e.g. scat, calls, tracks, and rubbings or markings on vegetation, and using these to assess population abundance. In Australia, the Environmental Protection Agency (EPA) provides a Frog Census Datasheet (below) on which volunteers record details about frog populations and habitat quality in their area. This programme enables the EPA to gather information across Australia.



Now we need you to return your datasheet and tape in the **postage free** post pak addressed to: REPLY PAID 6360 Mr Peter Goonan Environment Protection Agency GPO Box 2607 ADELAIDE SA 5001. We will identify your frog calls and let you know the results of your recordings.

INFORMATION NEEDED FOR THE FROG CENSUS

- Where you recorded frogs calling. When you made the recordings and What frogs you recorded (if possible)

Observers Name:
Contact Address:
Post Code:
Telephone Home: Work Mobile:
Do You Want to be involved next year? Please Circle: Y
Location Description (Try to provide enough detail to enable us to find s map
Please use a separate datasheet for each site)
Is location the same as in (CIRCLE) 1994 1995 1996 19
Grid Reference of Location and Type of Map Used:
OR Street Directory Reference: Year and Edition:
Page Number: Grid Reference:
Nearest Town from Location (if known)
Date of Observation (e.g. 8 Sept 1998)
Time Range of Observation (e.g. 6-8.30-8.40 pm)

HABITAT ASSESSMENT
Habitat Type (please circle one) pond dam stream drain reservoir wetland spring swamp
Comments:

WATER QUALITY and WEATHER
CIRCLE to indicate the condition of the site (you can circle more than one choice)
Water Flow Still Flowing Slowly Flowing Quickly
Water Appearance Clear Polluted Pretty Oily Muddy
Weather Conditions 1 Windy Still
2 Overcast / Recent Rains / Dry (indicate for 1 AND 2)

FROGS HEARD CALLING
Please indicate your estimate of how many frogs you heard calling
(NOTE it is very important to tell us if you heard no frogs)
Number of Calls Heard (circle):
None One Few (2-9) Many (10-50) Lots (>50)
If you want to test your frog knowledge write the species you heard calling
Species of Frog(s) Identified: 1. 2. 3. 4.
Comments:

Office use only. Please leave blank.
FROG SPECIES PRESENT.

Species 1	Species 2	Species 3	Species 4	Species 5

ENVIRONMENT PROTECTION AGENCY
ENVIRONMENT HERITAGE AND ABORIGINAL AFFAIRS

Recording a date and accurate map reference is important

Population estimates are based on the number of frog calls recorded by the observer

COD

Electronic devices, such as the bat detector pictured above, can be used to estimate population density of nocturnal, highly mobile species, such as bats. In this case, the detector is tuned to the particular frequency of the hunting clicks emitted by specific bat species. The number of calls recorded per unit time can be used to estimate numbers per area.

The analysis of animal tracks allows wildlife biologists to identify habitats in which animals live and to conduct population surveys. Interpreting tracks accurately requires considerable skill as tracks may vary in appearance even when from the same individual. Tracks are particularly useful as a way to determine habitat use and preference.

Sam Banks

All animals leave scats (feces) which are species specific and readily identifiable. Scats can be a valuable tool by which to gather data from elusive, nocturnal, easily disturbed, or highly mobile species. Fecal analyses can provide information on diet, movements, population density, sex ratios, age structure, and even genetic diversity.

1. (a) Describe the kind of information that could be gathered from the Frog Census Datasheet:

   _____

   (b) Identify the benefits of linking a measure of abundance to habitat assessment: _____

   _____

2. Describe one other indirect method of population sampling and outline its advantages and drawbacks:

   _____

   _____

   _____

Weblinks: *New Zealand Frog Survey*

Periodicals:
Bowels of the beasts

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