Monitoring Visitors to Natural Areas

A Manual with Standard Methodological Guidelines

Queensland Government
Sport and Recreation Queensland

Queensland Government
Environmental Protection Agency
Queensland Parks and Wildlife Service

The University Of Queensland

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ABBREVIATIONS

ABS	Australian Bureau of Statistics
ANZECC	Australian and New Zealand Environmental Conservation Council
ARC	Australian Research Council
AVOR	Average Vehicle Occupancy Rate
IUCN	The World Conservation Union
NSW NPWS	New South Wales National Parks and Wildlife Service
QPWS	Queensland Parks and Wildlife Service
SAS	Statistical Analysis System
SPIRT	Strategic Partnerships with Industry, Research and Training
SPQ	Sport and Recreation Queensland
SPSS	Statistical Package for the Social Sciences
VMS	Visitor Monitoring System
UQ	University of Queensland
VDS	Visitor Data System

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Preface

This Manual has been designed to provide methodological and operational guidelines for monitoring visitors in natural areas. A pragmatic view of natural areas is adopted as those areas where open space is a feature of the recreation setting. As such, the guidelines apply to a variety of tenure-independent areas including national parks, state forests, nature reserves, local government parks, and many other types of land tenure.

The need to incorporate information on visitors in natural-area management is now recognised as an imperative; however, little reliable visitor data are available. This Manual arose from the need identified by various natural resource and land management agencies to improve the way in which the planning and management of recreation is carried out in natural areas. The development of this Manual was funded by the Australian Research Council (ARC), and several state government agencies including the Queensland Parks and Wildlife Service (QPWS), the New South Wales National Parks and Wildlife Service, and Sport and Recreation Queensland. The project was based in the School of Natural and Rural Systems Management, at the University of Queensland (UQ), Gatton, from 2000-2002.

The Visitor Monitoring System presented in this Manual serves as a best-practice benchmark for monitoring visitor use and visitor behaviour. The system recognises that no single data collection method or group of methods are universally applicable for all purposes of data collection. Rather, the approach taken has been to specify standardised methodological guidelines for a variety of data collection methods, and the outputs to be produced. This is essential for maintaining data consistency and compatibility across land tenures. Natural resource and land management agencies can then design data collection programs that best meet individual needs and circumstances, while retaining data comparability. Such flexibility in the system is important to accommodate the diversity of natural area resources, visitation patterns, staffing levels, and management practices across land tenures.

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PART 1
Introduction

PART 1: INTRODUCTION

This Manual has been designed to provide standard guidelines for monitoring visitors in natural areas. Recreation occurs in many settings that have varying levels of naturalness, which can be expressed in a variety of forms ranging from completely wild, to partly natural, to modified-natural. For the purpose of this Manual, a pragmatic definition of naturalness is adopted. Natural areas are defined as those areas where open space is a feature of the setting. As such, the guidelines apply to a variety of tenure-independent areas including national parks, state forests, local government parks, and many other types of land tenure.

1.1 Managing Natural Areas: Balancing Dual Responsibilities

Natural areas in Australia are faced with increasing pressures from rising recreation demand (Bramley 1996; Charters 1996; Gabriel 1996). These areas provide multiple benefits to the community including the conservation of biological diversity, ecosystem services, and the provision of recreation and tourism opportunities. Traditional natural area management focused on the natural and cultural resource as the central element in the management process; however, this view has been challenged in several international and national reviews (e.g. New South Wales National Parks and Wildlife Service 1997; New South Wales National Parks and Wildlife Service 1998; British Columbia's Park Legacy Panel 1998; Environmental Protection Agency, Queensland Parks and Wildlife Service 1999; New South Wales National Parks and Wildlife Service 2000; Parks Canada 2000; Environmental Protection Agency, Queensland Parks and Wildlife Service 2001). More recently, the importance of monitoring visitor use is reflected in the need to address international and national reporting requirements (e.g. Montreal Protocol for Forests, World Heritage Reporting, State of the Parks Reporting), which are becoming increasingly important.

The need to incorporate information on visitors is now recognised as a management imperative, however, little reliable visitor data exist (Veal 1991; Victorian National Park Service 1996). For many areas, visitor numbers are the only data available (Blamey 1995), and even these data are notoriously unreliable. While independent visitor monitoring studies have been undertaken by various government agencies managing different land tenures, the work has been ad hoc and thus lacks an overarching framework for integrating the information into management and decision-making processes.

The need to collect more reliable visitor data for planning and management purposes is supported in many discussions of natural area management. In a review of visitor monitoring by the Queensland Parks and Wildlife Service during the mid-1980s, Harris (1985: 10-11) identified the following problems with data collection:

- statistical data collection is non-standardised,
- staff do not have adequate access to visitor data,
- visitor data are not responsive to practical requirements,
- data collected lacks a theoretical foundation,
- analysis is descriptive and non-interpretive,
- data are not centrally collated, analysed or stored, and
- data are usually not readily available for further analysis or research.

More recently, the need to improve the collection of visitor data in protected areas[1] across Australia and New Zealand was endorsed by the Australian and New Zealand Environmental Conservation Council (ANZECC) (Victorian National Park Service 1996).

In reviewing the national data standards for protected areas, the report to ANZECC found that:

- no system for the collection of visitor data is in place nationally,
- no systemised methodology is in place, and
- no state or territory was able to produce state-level data other than visitor numbers.

Since the report to ANZECC, several state natural resource and land management government agencies have begun to develop visitor-monitoring manuals (e.g. Department of Conservation and Land Management 2000; Northern Territory National Parks and Wildlife Commission 2001). The rising importance of visitor monitoring is further reflected in several collaborative projects between universities and natural resource and land management agencies to develop standard guidelines for visitor monitoring (e.g. Archer and Griffin 2002, Wilson et. al 2002; Moscardo and Ormsby (In Press)).

1.2 Visitor Monitoring: Bridging the Gap

To address deficiencies in visitor monitoring a collaborative SPIRT (Strategic Partnerships with Industry Research and Training) project, was funded by the Australian Research Council (ARC), and several state government agencies including the New South Wales National Parks and Wildlife Service (NSW NPWS), the Queensland Parks and Wildlife Service (QPWS) and Sport and Recreation Queensland (SRQ). The project was based in the School of Natural and Rural Systems Management, at the University of Queensland (UQ), Gatton from 2000-2002. The research team was lead by Dr. Louise Horneman, Associate Professor Bob Beeton, and Dr. Marc Hockings.

The aims of the collaborative project were:

1. to develop, test and validate a standardised methodology for collecting information about the different types of visitors to natural areas; and
2. to demonstrate how a wider understanding of visitor attributes can contribute to more sophisticated and effective planning and management of natural areas.

Several outcomes from the project were produced, including:

1. a properly tested, validated, and standardised methodology for the collection and analysis of visitor data;
2. a manual providing operational and methodological guidelines;
3. a blueprint for a database to be constructed from aggregated surveys which will allow the comparison of individual areas to regional, state or national baselines;
4. a description of the types of visitors to natural areas; and
5. a demonstration of how better knowledge of visitor expectations and attributes can contribute to management without compromising conservation objectives and values.

[1] The World Conservation Union (IUCN) (1994) defines a protected area as an area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

1.3 Objectives of the Manual

The purpose of this Manual is to provide methodological and operational guidelines for monitoring visitors in a diverse range of natural areas. Specifically, the objectives of the Manual are:

1. to provide a tool-kit of methods for monitoring visitor numbers and surveying visitor behaviour that caters for the diversity of natural areas;
2. to specify standard guidelines for data collection, analysis, and reporting; and
3. to provide data that are compatible and comparable across various temporal intervals (e.g. monthly, quarterly, annually), spatial scales (e.g. local, regional, state), and land tenures (e.g. national parks, state forests, regional parks, community and council parks).

1.4 The Visitor Monitoring System

The Visitor Monitoring System (VMS) presented in this Manual serves as a best-practice benchmark for monitoring visitors to natural areas. The methodological guidelines have been designed to collect data from visitors who are actually visiting the area in question. The guidelines do not apply to visitor studies that are aimed at the non-visiting population or general community. The visitor monitoring system has two components (Figure 1):

1. Visitor Use (numbers), and
2. Visitor Surveys.

The visitor monitoring system provides a methodological blueprint for monitoring visitor use (Part 2) and visitor behaviour (Part 3) across a diversity of natural areas. While the visitor monitoring system is based on a standardised set of methodological guidelines, the system recognises that no single data collection method or group of methods are universally applicable for all purposes of data collection. Rather, the approach taken is to specify the methodological guidelines for a variety of data collection methods, and the outputs to be produced. This is essential for maintaining data consistency and comparability across various jurisdictions and land tenures. Land management agencies can then design data collection programs that best meet individual needs and circumstances, while retaining data comparability. Such flexibility in the visitor monitoring system is necessary to accommodate the wide diversity of natural area resources, visitation patterns, staffing levels and managerial styles across the different land tenures.

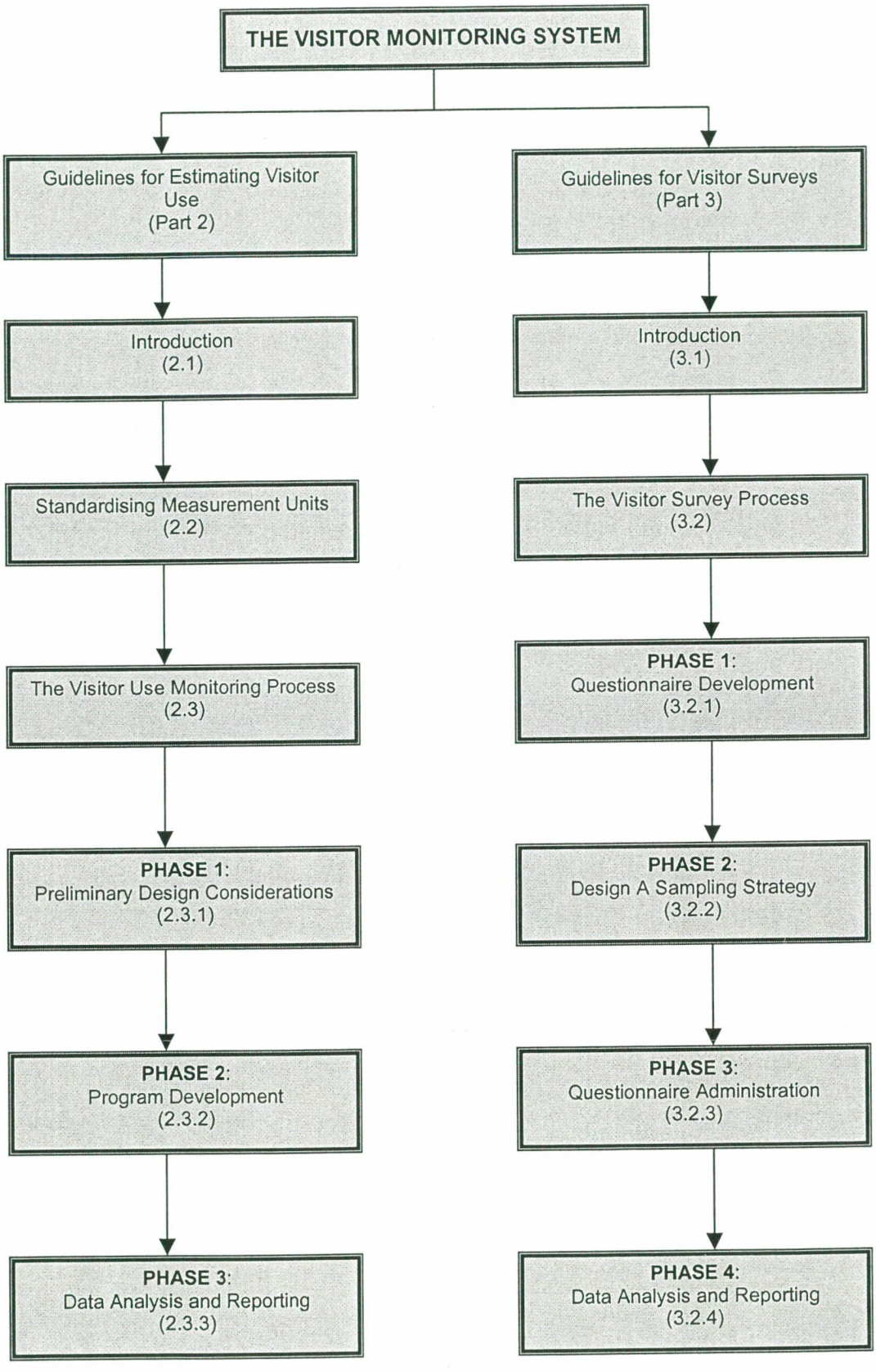


Figure 1 The visitor monitoring system

PART 2

Guidelines for estimating visitor use

PART 2: GUIDELINES FOR ESTIMATING VISITOR USE

2.1 Introduction

This section details the methodological guidelines for estimating visitor use (numbers) in natural areas (see Figure 2). The section begins by emphasising the importance of adopting standard measurement units for comparing data across various spatial and temporal scales. An eight-step process for monitoring visitor use is then presented. The eight-step process highlights key principles and standard data collection protocols for developing a visitor use monitoring program.

2.2 Standardising Measurement Units

To compare visitor numbers over time and between sites, a standard set of measurement units must be adopted. The standard measurement units proposed by the Australian and New Zealand Environment and Conservation Council (ANZECC) for protected areas are recommended (Victorian National Park Service 1996: 3). Several protected area agencies in Australia, the South Australian Parks and Wildlife Service, the Northern Territory Parks and Wildlife Commission, and the Tasmanian Parks and Wildlife Service, have adopted the ANZECC standard measures for estimating visitor numbers. These measures incorporate both purpose and duration of visit:

> ***the person entry*** occurs whenever a person enters an area for any purpose;
>
> ***the person visit*** occurs when a person visits an area for the first time on any given day or on the first day of the stay for the purpose of participating in related activities;
>
> ***the person visit-day*** occurs when a person stays in an area for a day or part day, each day the person stays counts as an additional person-visit-day; and
>
> ***the person visit-hour*** is used for visits to areas where the person cannot stay overnight but where different lengths of stay, ranging from minutes to hours, can be significant to management.

2.3 The Visitor Use Monitoring Process

To estimate visitor use, a monitoring process has been designed which incorporates three phases: (1) Preliminary Phase, (2) Program Development Phase, and (3) Data Analysis and Reporting Phase (Figure 2). The monitoring process follows key principles of visitor monitoring to assist in the design of a visitor-monitoring program.

2.3.1 Phase 1: Preliminary Design Considerations

2.3.1.1 Step 1: Clearly define the rationale for data collection

The first step in the preliminary design phase is to clearly define the rationale for visitor monitoring. The monitoring of visitor use should not be undertaken for its own sake. The rationale or reason for investing in visitor data needs to be clearly stated and targeted to data sets. Once the rationale for collecting data has been defined and reviewed, the objectives for monitoring can then be developed.

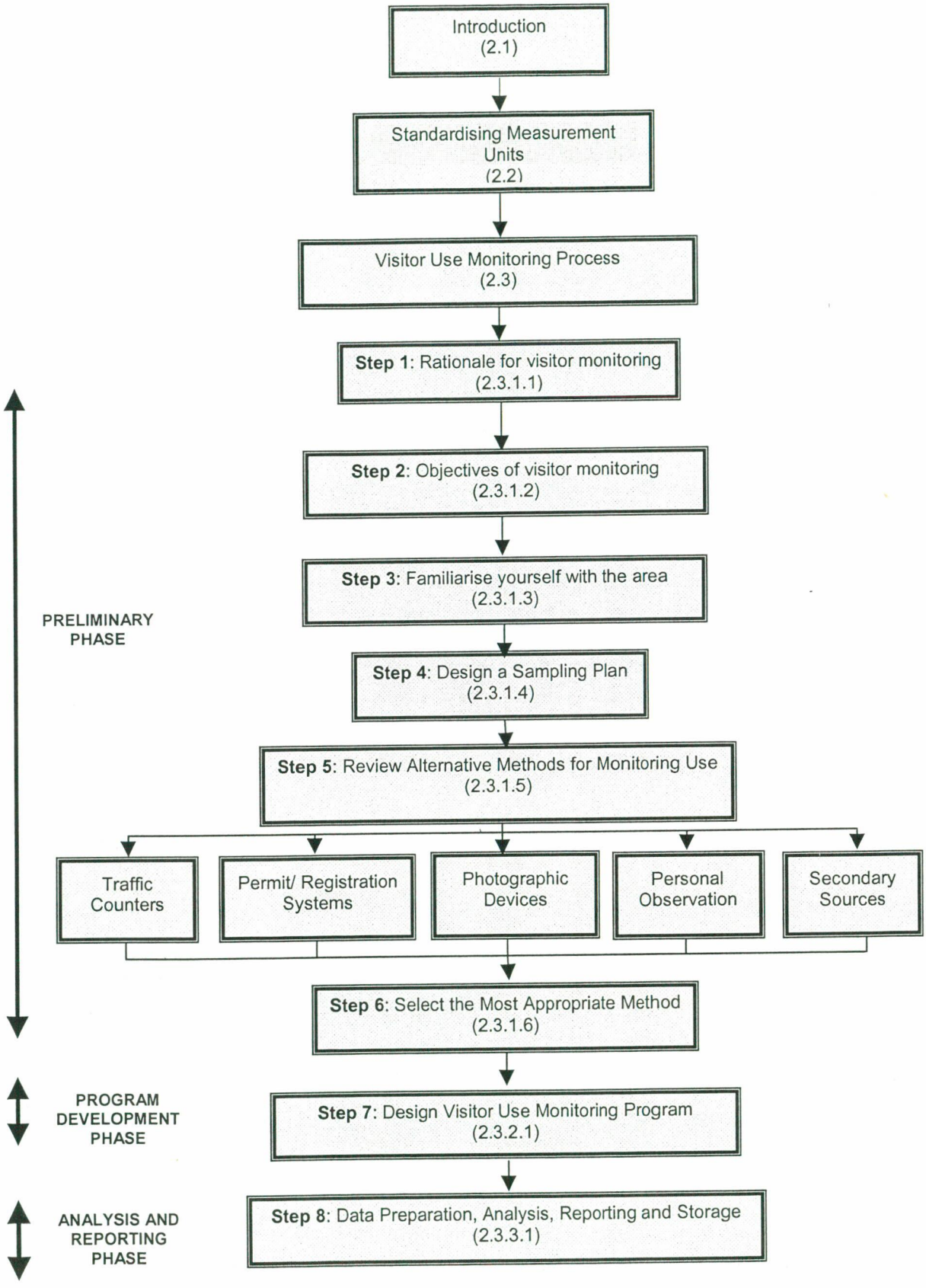


Figure 2 Guidelines for estimating visitor use

2.3.1.2 Step 2: Determine objectives of monitoring visitor use

The second step is to clearly state the objectives or reasons for monitoring visitor use. The objectives may be very general, for example, to measure the total number of visitors to a particular area over a specified time period, or they may be very specific, for example, to measure the number of visitors who use a particular walking track over a specified time period. The nature of the research objectives will influence the design of the visitor-monitoring program.

2.3.1.3 Step 3: Familiarise yourself with the area

The third step in visitor monitoring is to become familiar with the patterns of visitor use in the area in question. The following tasks need to be undertaken:

- map the area indicating the main access points, key natural features and visitor attractions, recreation sites and facilities, as well as any undeveloped areas where known visitor activity is occurring;
- list and name all the sites and recreation opportunities (the products of setting and activity combinations where each combination of recreation activity and setting constitutes a different recreation opportunity) that the area has to offer and briefly summarise what is known about patterns of use for each site; and
- consult staff and other individuals who have local knowledge about visitor use and record their views and opinions.

In this step, utilise all available information sources to compile as accurate a picture of visitor use as practicable. An outcome of this step is to develop an understanding of:

- how, when and why visitation is taking place in the area;
- the special attributes and qualities of the area; and
- any special seasonal use characteristics.

Having completed the third step, check whether the objectives for monitoring visitor use undertaken in Step 2 need refining or adjusting.

2.3.1.4 Step 4: Design a sampling plan

Accurate visitor data begin with a well designed sample plan. The aim of the sampling plan is to obtain a representative sample of visitors. The sampling plan should be documented to provide a standard level of consistency and reliability, allowing for comparisons to be made over time. The sampling plan should be filed, and included in the visitor monitoring report (section 2.3.3.1) for reference purposes. The design of a sampling plan will involve the following tasks:

- Define the sampling objectives (or reasons) for collecting visitor use data.
- If resources (e.g. staffing, funding, time) are limited, objectives may need to be prioritised. One method of prioritising objectives is to develop a three- to five-year sampling plan that specifies the groups, locations, and which year and season, if seasonality is an issue, are to be sampled.
- Using the map developed in Step 3, overlay spatial patterns of use by consulting staff and relevant individuals who have local knowledge of visitor use.

- The population, sample, sampling frame, and sampling unit then need to be defined:

  Population is determined by what you are intending to measure. In most cases, the population will be the number of visitors in a specified time period. For example, the population may be all visitors to an area, or visitors who have a particular attribute.

  Sample is a subset of the population that is used to generalise to the population as a whole. To generalise findings, the sample must be representative of the population.

  Sampling frame is the complete list of all possible sampling units in the population of interest from which the sample is drawn. In most cases, the sampling frame will consist of the time period for which visitor use estimates are needed.

  Sampling unit is defined by the objects of study. The sum total of all the units is called the sample. For example, if you want to describe the average number of visitors using a particular walking track over a particular time frame, the sampling unit is person visits per hour or day (see section 2.2).

- The next task is to select the sampling method. Sampling methods are usually divided into two broad types: probability and nonprobability:

  Probability Sampling provides a statistical basis for saying that a sample is representative of the population. In probability sampling every unit of the target population has a known, non-zero probability of being included in the sample. In probability sampling, the theory of probability allows the researcher to calculate the nature and extent of any biases in the estimate and to determine what variation in the estimate is due to the sampling procedure. The most common probability sampling methods include simple random sampling, stratified random sampling, systematic sampling, and cluster sampling (Table 1).

  Nonprobability Sampling involves samples which are chosen based on judgment regarding the characteristics of the target population and the needs of the research. With nonprobability sampling, some units of the population have a greater chance of being selected than others. Nonprobability sampling methods should only be used when sampling frames are unavailable or the size of the population cannot be calculated. Nonprobability sampling methods include convenience sampling, purposive sampling, quota sampling, and snowball sampling (Table 1).

  A brief description of each probability and nonprobability sampling method and a summary of each method's strengths and weakness is presented in Table 1. A more detailed description of each sampling method is presented in Appendix I.

  For a more comprehensive review of sampling methods see Kish (1965), Henry (1983), Fink (1995), Babbie (1990), Bouma (2000), Burns and Bush (2000), and Malhotra et. al (2002).

Table 1 Probability and nonprobability sampling methods

Description	*Strengths*	*Weaknesses*
Probability Sampling		
Simple random sampling		
The probability of being selected from the sample frame is known and every unit has an equal chance of selection	Easily understood; results are projectable to target population; most efficient when populations are geographically concentrated	Difficult to construct sampling frame; expensive, low precision; no assurance of representativeness
Stratified random sampling		
The study population is grouped according to meaningful strata or characteristics Elements are selected from each stratum by a random procedure	Includes all important subpopulations; precision; cost effective	Difficult to select relevant stratification variables; not feasible to stratify on many variables; expensive
Systematic sampling		
The sample is chosen by selecting a random starting point and then selecting every *k*th element in succession from the sampling frame The sampling interval, *k*, is determined by dividing the population size by the desired sample size	Can increase representativeness: easier to implement than simple random sampling; sampling frame not necessary	Can reduce representativeness because the population is divided into groups before the sample is selected; subject to sample bias if repetition is a natural component of the sampling frame (e.g. ranking, sorting)
Cluster sampling		
Natural groups or clusters are sampled, with members of each selected group sub-sampled afterward	Easy to implement; cost effective	Imprecise; difficult to compute and interpret results
Nonprobability Sampling		
Convenience sampling		
Use of a group of individuals or units that is readily available The selection of the place and, consequently, potential respondents is subjective rather than objective	Least expensive; least time consuming; most convenient	Selection bias; sample not representative; lacks generalisability
Purposive sampling		
Judgement is used to identify which sampling unit to choose from Those that best meet the purpose of the study are selected	Low cost; convenient; time efficient	Generalisation of results not possible; subjective
Quota sampling		
The population is divided into sub-groups Quota samples rely on key characteristics to define the composition of the sample	Sample can be controlled for certain characteristics; useful when detailed demographic profiles of the population to be sampled exists	Selection bias; no assurance of representativeness
Snowball sampling		
Previously identified members identify other members of the population	Can estimate rare characteristics; suitable for researching specialised populations	Time consuming; no assurance of representativeness

- The next task is to determine an appropriate sample size. This is one of the most critical steps in designing the sampling plan. The determination of an adequate sample size involves making trade-offs among the following criteria:
    - the importance of the decision,
    - the nature of the research,
    - the number of variables,
    - the nature of the analysis,
    - sample sizes used in similar studies,
    - resource constraints (e.g. staffing, time, budget),
    - the degree of accuracy (or confidence) required for the sample, and
    - the degree of error that can be tolerated in count estimates.

  The determination of an adequate sample size should also take into consideration the rationale for collecting visitor data (step 1) and the objectives for monitoring visitor use (step 2).

2.3.1.5 Step 5: Review alternative methods for monitoring visitor use

Having designed the sampling plan, the next step is to select the most suitable measurement techniques for monitoring visitor use. A variety of methods are available to estimate visitor use. The methods are grouped into five main types:

1. vehicle and pedestrian traffic counters,
2. permit and registration systems,
3. photographic devices,
4. personal observation, and
5. secondary sources.

A description of each method, their strengths and weaknesses, where they can be used, and sampling considerations is presented below. This is followed by a discussion of the key criteria that need to be considered when selecting the most appropriate method.

1. Vehicle and Pedestrian Traffic Counters

Description

Counters record the passing of objects, including vehicular and pedestrian traffic. Counters can be used in a variety of locations such as roads, walking tracks, rivers, or any area where a visitor must pass a given point. Counters may also be used to measure the use of a facility (e.g. door counters on toilets) or resource (e.g. the amount of water consumed for toilets and showers). A variety of traffic counting techniques are available to estimate visitor numbers (for a comprehensive review see Hornback and Eagles 1999). The advantages and disadvantages of vehicle and pedestrian traffic counters are presented in Table 2.

Table 2 Advantages and disadvantages of vehicle and pedestrian traffic counters

Advantages	*Disadvantages*
Installation costs are relatively low	Tend to be subject to vandalism (if visible)
Easy to operate	Can be weather sensitive
Automation makes counters efficient	When used alone, counters provide limited data
Require small components of staff time	

Where Vehicle and Pedestrian Traffic Counters Can Be Used

Counters work most effectively in areas that have formal access (by road, walking track) and contain a limited number of access points. If there are many access points, more counters will be needed or one counter will have to be rotated. The data reported from rotated counters become estimates based on partial counts.

When counting *vehicular traffic* on roads, the counter should be located at the entrance to the site. Counters should not be located where vehicles are likely to stop or turn sharply. Traffic counters are not effective in areas where visitors enter and leave the area multiple times (e.g. campgrounds).

When counting *pedestrian traffic*, the counter should be located far enough along the track to avoid visitors who are 'looking' but not walking. The counter should be located on a narrow section of the track where visitors pass by in single file. Counters should not be located where it is likely visitors may stop and rest (e.g. scenic areas).

Building on the information that was compiled in step 3, the following factors should be considered before positioning traffic and pedestrian counters:

- think of the visitors, their visits, how they travel to the area, and patterns of use in the area,
- compile detailed and accurate information about visitor use to determine the most cost effective site(s) where counters should be placed,
- assess the relationships between areas of use, and
- estimate relative volume of traffic for sites with multiple entrances and exits.

Sampling Considerations for Vehicle and Pedestrian Counters

All vehicle and pedestrian counters should be calibrated to check the relationship between the counter recording and actual counts. The purpose of calibration is to determine the level of accuracy between recorded counts and actual counts. Any possible recording error can then be factored into recorded counts to produce a more reliable and accurate estimate of use. In most cases, calibration is a relatively simple task. For instance, to check that a counter on a toilet door is providing correct readings, open and shut the door for a set number of times, and then check to see whether the counter has recorded an accurate count. Counters should be calibrated on a regular basis (e.g. six monthly).

To calibrate vehicle traffic counters an extra step is required. While the principles discussed above equally apply to vehicle traffic counters, conversion factors also need to be calculated to estimate average vehicle occupancy rates (AVOR). The purpose of calibrating vehicle traffic counters is to derive a number (or conversion factor) by which a traffic counter reading can be multiplied to give the number of visitors to a site. The conversion factor represents the number of visitors per count. The aims of a vehicle counter calibration survey are:

- to determine seasonal variation in visitation;
- to determine recreation visitors per vehicle;
- to determine an average conversion factor; and
- to detect any errors in counters.

Vehicle counter calibration surveys should be undertaken to derive correct conversion factors for each area in question. For those areas where seasonality effects visitation, conversion factors need to be determined and used on a seasonal basis. Calibration surveys return a conversion factor for a 'snapshot' period, normally three days. That snapshot period should be typical of the month or season to which the conversion factor will be applied. If a three-day snapshot period is chosen, for convenience, the days should be consecutive and take in one weekend day. Unless a significant change in use patterns is observed, conversion factors need only be calculated every 12 months.

2. Permit and Registration Systems

Description

Permit and registration systems are one of the few methods that provide a direct measure of visitor use. Permit systems generally fulfil three objectives:

1. to regulate use,
2. to provide a contact point for visitors, and
3. to provide information on visitor use.

Permit and registration systems are commonly used at campgrounds, at the beginning of walking tracks, and visitor centres. The advantages and disadvantages of permit and registration systems are presented in Table 3.

Table 3 Advantages and disadvantages of permit and registration systems

Advantages	*Disadvantages*
Provide an accurate record of permitted activity	Cannot estimate total visitor numbers
Provide additional data aside from numbers	Do not provide data on frequency of visit
Little additional cost if a system of permits and registration is already in place	Accuracy is dependent on compliance rate

Where permits can be used

Aside from collecting visitor-use data, permit systems allow for special regulation of use in circumstances where special management controls apply. These circumstances typically arise when there is a need to:

- minimise impacts,
- maintain use levels within servicing capacities, and
- control large or special groups who may disrupt the enjoyment of other visitors.

Sampling Considerations

While permits generally provide an accurate and reliable measure of specialised visitor use, an understanding of what the permit is measuring, and of actual compliance rates is necessary before analysing and interpreting permit and registration data.

3. Photographic Devices

Description

Advances in technology have meant that a variety of photographic devices now exist for monitoring visitor use (e.g. 35mm cameras, video cameras, and digital cameras). Photographic devices estimate visitor use by photographing the area in question. The pictures are then examined to estimate use at the site. A variety of visitor data including the number of individual visits, group size, and activity participation may be observed with photographic devices. The advantages and disadvantages of photographic devices is presented in Table 4.

Table 4 Advantages and disadvantages of photographic devices

Advantages	*Disadvantages*
Appropriate method in low-use areas	May be subject to vandalism
Provides information in addition to visitor numbers	Data will be inaccurate if not systematic
Useful in settings where groups congregate	Equipment can be difficult to install and operate

Where Photographic Devices Can Be Used

It is important that the privacy of visitors be respected when positioning photographic devices. For example, visitors should not be photographed in the privacy of their campsite. The site must be small enough and open enough so that all visitors fit into the view of photographic equipment. Furthermore, the site must contain a suitable location for mounting the device. The density of foliage and distance of the equipment from visitors also needs to be considered. The view should not be obscured, and the viewing distance should be close enough to record the desirable visitor information. If considering the use of photographic devices, it is necessary to obtain ethical approval to a recognised current standard.

Sampling Considerations

The field view of photographic devices is generally fixed. This means that the relationship between use within the field of view and in the balance of the site should be known. Because photographic devices sample use at discrete points in time, no record of use between photographs is available. Photographic frequencies need to be higher where use is changing rapidly.

4. Personal Observation

Description

In areas where there are multiple or uncontrolled entrances, personal observation can be a very effective method for estimating use as observers do not have to stay at one specific place. Collecting visitor data through observation is a popular technique because it is can be incorporated into existing duties when convenient (e.g. patrols), making it a cheap and easy method of data collection. Although this technique is often used, it is usually done incorrectly because observations are not systematic. However, the usefulness of data collected through observation should not be underestimated. Depending on an area's characteristics, additional visitor information such as group size, activity participation, and some observable socio-demographic characteristics (e.g. gender) can often be obtained. The advantages and disadvantages of personal observation are presented in Table 5.

Table 5 Advantages and disadvantages of personal observation

Advantages	*Disadvantages*
Useful in areas where other systems will not work	Counts will be inaccurate if not systematic
Can provide data aside from visitor numbers	Observation requires considerable personnel time
Can be incorporated into existing duties	No cost reductions for counts in future years

Where Personal Observation Can Be Used

The observer must adhere to a predetermined sampling plan. The sampling plan should specify when, where, by whom, and how the data are to be collected. During the sample period, the observer should not influence or disturb visitor use behaviour.

Sampling Considerations

Because there is no way of estimating errors using personal observation, a set of sampling rules and observational training notes and techniques are the best methods for minimising observer bias and error.

5. Secondary Sources

Description

Information on visitation to the area in question that is collected for other purposes may be useful for estimating use. Examples of local activities that may record visitor numbers include:

- transport authorities or companies (e.g. railways, airports, coaches),

- accommodation establishments (e.g. caravan parks, motels, hotels, resorts),
- tourist information centres,
- government authorities (e.g. Departments of Main Roads), and
- commercial operators (e.g. guided tours, kiosks).

While such data may include activity data that are not related to the area in question, there may be ways to make adjustments that will provide an indication of the proportion that has the area in question as a destination. The advantages and disadvantages of secondary sources are presented in Table 6.

Table 6 Advantages and disadvantages of secondary sources

Advantages	*Disadvantages*
Cost-effective means for estimating visitor use	May be biased
When used with other methods, provides an opportunity for triangulating visitor data	Because of the confidential nature of much secondary and, in particular, commercial data, some sources may be difficult to obtain
	May be poorly maintained, and therefore provide an inaccurate account of visitation

Where Secondary Sources Can Be Used

Secondary sources such as information collected by commercial tour operators using the area can often provide useful visitor information. For example, information collected by tour operators may include visitor use of kiosks, accommodation, equipment hire, and guided tours.

Sampling considerations

Sampling issues may become relevant if secondary sources are used to predict aspects of visitor use not directly related to the secondary data. Where direct visitor-use data are not available, relationships between secondary measures and actual use need to be determined.

2.3.1.6 Step 6: Select the most appropriate method(s)

The choice of method is a critical decision in the data collection process. The decision is seldom easy as there are many factors to consider. Past research has demonstrated that several important factors need to be considered before selecting and implementing data collection techniques. These factors include:

1. the amount of time and effort required to implement the technique;
2. the initial cost of purchasing and installing the equipment;
3. the future maintenance costs;
4. the reliability of data collected, and
5. the level of visitor imposition.

2.3.2 Phase 2: Program Development

2.3.2.1 Step 7: Design a visitor use monitoring program

The visitor use monitoring program specifies the guidelines and procedures that need to be followed when collecting data for estimating visitor use. The resulting plan sets out the protocols that need to be adhered to ensure data comparability and consistency. The visitor use monitoring program needs to specify the following:

- what data are to be collected,
- where the data are to be collected,
- when the data are to be collected,
- who is to collect the data (staff responsibilities), and
- what happens to the data once collected (data processing and reporting).

2.3.3 Phase 3: Data Analysis and Reporting

2.3.3.1 Step 8: Data preparation, analysis, reporting and storage

The data preparation process involves data editing and data entry. The purpose of data editing is to make sure that data collection forms have been filled out properly and completely, with the objective of increasing accuracy and precision. Editing is an extremely tedious and time-consuming task, however, it is an important step in the data preparation stage.

Once the data have been edited, the next step is data entry. Data entry refers to the process of converting information from a form that cannot be read by a computer to a form that can be read by a computer. This process requires a data entry device and a storage medium. A Visitor Data System (VDS), adopted by the New South Wales National Parks and Wildlife Service and Parks Australia, originally developed by the South Australian Parks and Wildlife Service, has been recommended for adoption as a state-wide database across New South Wales and Queensland. At present, the Visitor Data System has been designed to store, analyse and generate reports for manual and digital traffic counter data. This system provides a range of options for output (e.g. tabulated data and graphics such as bar and pie charts) that are satisfactory for management reporting on visitor use of natural areas. For more information, refer to the Visitor Data System Training Manual (New South Wales National Parks and Wildlife Service and Environment Australia 2002). Alternatively, data can be entered into standard data analysis software such as Microsoft Excel for simple reporting purposes.

A competent data entry operator should be employed to enter the visitor use data. Data are generally entered directly from the data collection forms. However, recent technological advances in data entry, such as optical scanning, have significantly reduced the personnel time required for data entry.

Once the data have been entered, the data need to be verified. Data verification involves checking the data entered against the raw data to identify any errors that may have occurred during the data entry process. If electronic scanning devices are used to enter the data, data verification involves a cross check of the scanned data against the raw data.

The analysis of visitor use data should initially involve tabulation of the data. Data tabulation can be done using a variety of software mediums from simple reporting using Microsoft Excel, to more sophisticated analytical databases such as the Visitor Data System. A common and simple approach used to tabulate visitor use data is frequency distribution. A frequency distribution organises data into classes, or groups of values (e.g. weekly, monthly, quarterly visitation data), and shows the number of observations from the data set that falls into each of the classes. For reporting purposes, frequency distribution is typically displayed as a histogram.

When time series data (or data collected over time) are involved, and establishing the validity of trends is an issue, data analysis goes beyond visual reporting to more sophisticated statistical analysis. In such cases, a statistician should be consulted during the design of the data collection program and during the analysis stage. There are a variety of modern software packages available that allow statistical tests to be applied to both trend data and comparative data (e.g. SPSS (Statistical Package for the Social Sciences) and SAS (Statistical Analysis System)). Sophisticated statistical packages such as these have internet sites that can be accessed for a variety of information.

When analysis is complete, the final task is to ensure that the data are appropriately warehoused. Data warehousing involves adding the data to a central database (such as the Visitor Data System), storing the data on site in electronic and physical form, and also storing any reports that have been generated. Best practice requires that all data acquired, and physical reports generated, be recorded in a meta-database which catalogues information relating to the data collection process (e.g. data collection site, name(s) of data collectors, sampling plan, dates etc.). It is essential that clear notes, comments and notations are recorded in the meta-database and with materials that are lodged or stored. In the case of electronic data, the software program including type and version should be written in permanent ink on the media. Over time, it is good practice to occasionally re-transform the data from an old format to a more updated analytical and reporting format. Modern electronic storage systems generally have a life of approximately five years. It is therefore recommended that all visitor data be re-transformed at least every five years.

PART 3
Guidelines for visitor surveys

PART 3: GUIDELINES FOR VISITOR SURVEYS

3.1 Introduction

This section details the methodological guidelines for conducting visitor surveys in natural areas. A visitor survey process is presented which incorporates four phases: (1) Questionnaire Development Phase, (2) Sample Design Phase, (3) Execution Phase, and (4) Data Analysis and Reporting Phase. The section concludes with a discussion on ethical considerations in survey research.

3.2 The Visitor Survey Process

3.2.1 Phase 1: Questionnaire Development

This phase involves a series of steps for designing a questionnaire (Figure 3). The first step determines the survey objectives, resources and constraints; this is followed by a review and comparison of the main modes of data collection. The next step determines the survey questions, including wording and format, then layout and flow of the questionnaire are established and evaluated. Before preparing the final copy, the questionnaire is pre-tested to check for any construction and administration defects.

3.2.1.1 Step 1: Define survey objectives, resources and constraints

The first step in constructing a visitor survey is to clearly define the research objectives, resources and constraints that will guide the overall design of the survey instrument. Survey objectives should be stated as clearly and precisely as possible. The objectives are the reasons for undertaking the survey. The research objectives may be of a general nature, for example, to develop a profile of visitors to a particular natural area (e.g. national park), or of a specific nature, for example, to develop a profile of visitors who use a particular section of a natural area (e.g. developed sites versus undeveloped sites).

During this step it is important to identify resource constraints (e.g. budget, staff, and time available) versus information needs. The resources that are available to administer a visitor survey will also have an influence on the mode of data collection that is most appropriate or suitable. A plan should be developed that indicates the budget, staff, and time available for each step in the survey process.

3.2.1.2 Step 2: Review methods of data collection

Research methods can be divided into two broad categories:

> **Quantitative research** is a research methodology that seeks to quantify the data and, typically, applies some form of statistical analysis;
>
> **Qualitative research** is an unstructured, exploratory research methodology based on small samples intended to provide insight and understanding of the problem setting.

The differences between the two research methodologies are summarised in Table 7. Although the research methods are often presented separately, they are not mutually exclusive. For example, qualitative methods (e.g. focus groups and in-depth interviews) may be used at the beginning of a research project to identify key issues that are then tested using quantitative methods such as surveys. Alternatively, qualitative methods may be employed after quantitative methods to obtain a more detailed

understanding of key issues that were found during the quantitative phase. This Manual focuses on quantitative research methods most commonly used to survey visitors to natural areas. For a more detailed discussion on qualitative research methodologies, see Glaser and Strauss (1967), Tesch (1990), Glesne and Peshkin (1992), Miles and Huberman (1994), Denzin and Lincoln (1994), Potter (1996) and Patton (2001). Before contemplating qualitative research, it is recommended that a professional experienced in qualitative research be involved in the research process.

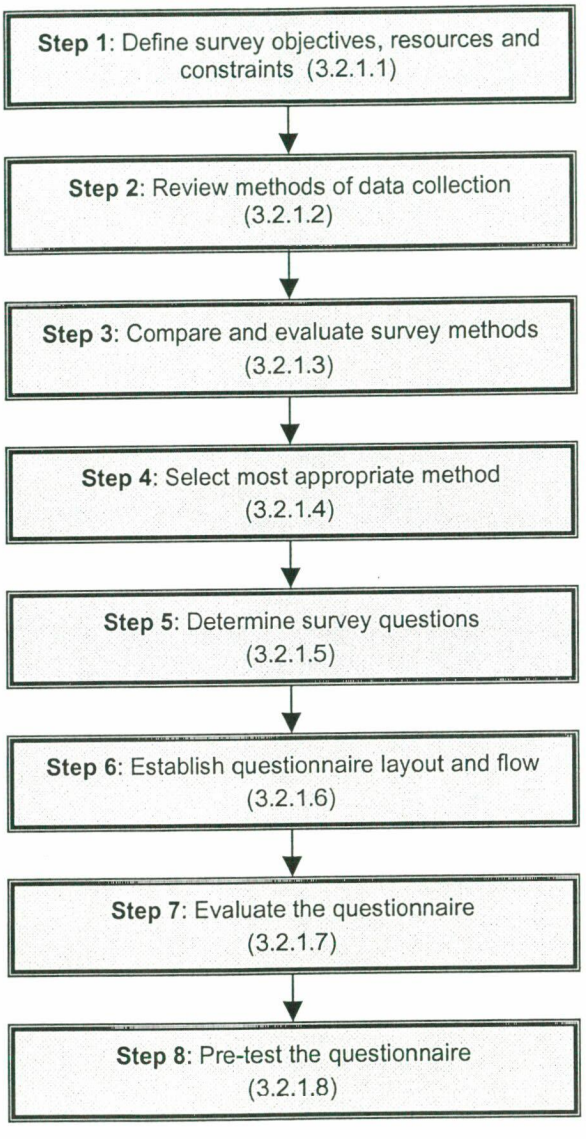


Figure 3 Phase 1 (Questionnaire Development) in survey research

The most common approach to classify survey research methods is by mode of administration (Figure 4). Questionnaires may be administered by four major modes:

1. personal surveys,
2. telephone surveys,
3. electronic surveys, and
4. mail surveys.

Table 7 Qualitative versus quantitative research methods

	Qualitative research	*Quantitative research*
Objective:	To gain a qualitative understanding of the underlying reasons and motivations	To quantify the data and generalise the results from the sample to the population of interest
Sample:	Small number of non-representative cases	Large number of representative cases
Data collection:	Unstructured	Structured
Data analysis:	Non-statistical	Statistical
Outcome:	Develop an initial understanding	Recommend as final course of action

Source: Malhotra et. al (2002: 192).

A description of each data collection mode and the various administrative methods, along with their advantages and disadvantages, is presented below. For a more comprehensive review of survey data collection methods see Babbie (1990), Fowler (1993), de Vaus (1995), McDaniel and Gates (1999), West (1999), Aaker, Kumar and Day (2000), and Bouma (2000).

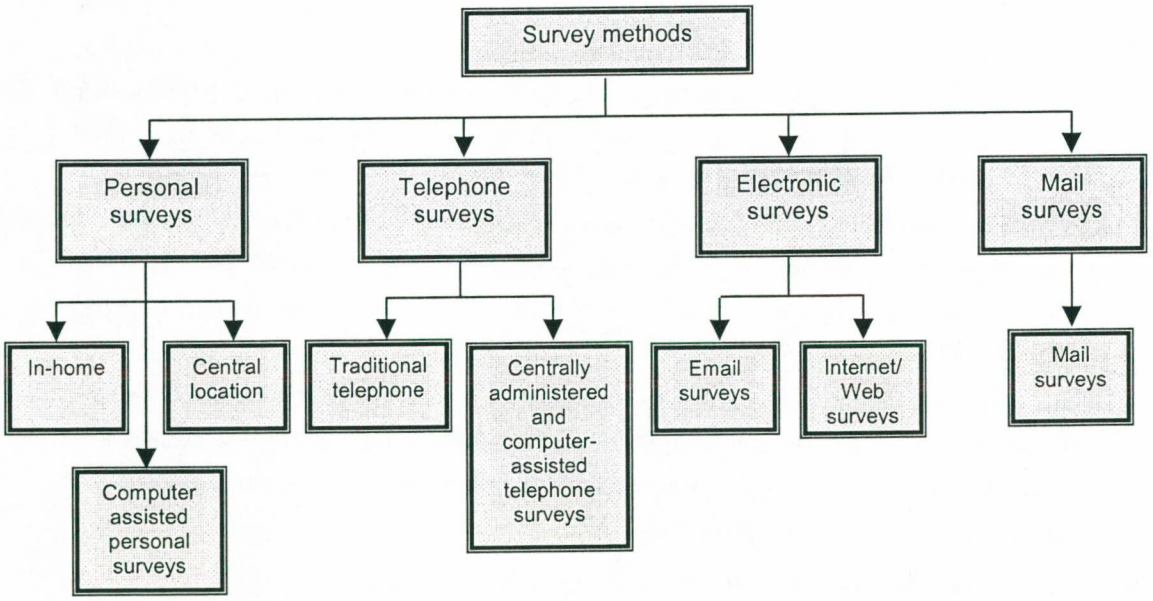


Figure 4 Classification of survey method by mode of administration

1. Personal Survey Methods

A person-administered survey is one in which an interviewer reads questions to the respondent and records the respondent's answers. There are three variations of personal survey methods, and their differences are largely based on the location of the survey. These variations include the in-home survey, the central location personal survey, and the computer-assisted survey.

Personal In-home Survey

In-home surveys are conducted in the home of the respondent. The interviewer's task is to contact the respondents, ask the questions, and record the responses. In recent years, personal in-home surveys have declined due to their lack of cost effectiveness. Today, limited access, security cameras, security entrances, and changing lifestyles have made personal in-home surveys more difficult than twenty years ago. Nevertheless, they are still used, particularly for national syndicated studies.

Central Location Personal Survey

This method is characterised by basing the survey location in a place that the target population is likely to frequent. Potential respondents are intercepted as they come within the area and are asked to participate in a survey. The central location may be a shopping centre, a business lounge at an airport, a visitors centre, campground or picnic area.

Computer-assisted Personal Survey

Computer-assisted personal surveying introduces the use of direct entry of research information into a computerised database. This may involve a personal interviewer recording the responses on a personal computer or, alternatively, the respondent sits in front of a computer terminal and answers a questionnaire on the video display screen by using the keyboard, a mouse, or touch screen.

Personal Survey Methods: Advantages and Disadvantages

Advantages: An interviewer, face to face with a respondent, is able to arouse initial interest and thereby increase the rate of participation and establish continuing rapport. Furthermore, it is feasible to ask complex questions and enhance their meanings with pictorial and mechanical aids, clarify misunderstandings, and probe for more complete answers. The personal survey method has a high degree of flexibility. Questions can be asked in a variety of sequences depending on the characteristics of the respondent or their previous answers. Personal surveys have the advantage of providing feedback during the data collection process. Interviewers are able to respond to direct questions from respondents, for example, when respondents have not understood the instructions.

Disadvantages: Person-administered surveys are time consuming and costly. Changing demographic structures, particularly the growth of the two-adult working family, have reduced the availability of potential respondents. Finally, the costs associated with call-backs that are needed to achieve high response rates are increasing.

A summary of the advantages and disadvantages of person-administered surveys is presented in Table 8.

Table 8 Advantages and disadvantages of person-administered surveys

Advantages	*Disadvantages*
Rapport	Time consuming
Visual aids	Expensive
Flexibility	Respondent availability declining
Feedback	High call-back costs
Quality control	
Adaptability	

2. Telephone Survey Methods

A telephone-administered survey is one in which the interviewer reads questions to the respondent and records the respondent's answers. There are two variations of telephone survey methods: the traditional telephone survey and the centrally administered, computer-assisted telephone survey.

Traditional Telephone Survey

The traditional telephone survey involves phoning a sample of respondents and asking them a series of questions. The interviewer uses a hardcopy questionnaire, which is almost identical to that used in personal surveys. The interviewer records the responses to the questions by circling or ticking pre-coded responses, or writing in the verbatim responses when open-response questions are asked.

Centrally Administered and Computer-assisted Telephone Survey

Computer-assisted telephone surveys from a central location are now more popular than the traditional telephone method. Computer-assisted telephone interviewing uses a computerised questionnaire administered to respondents over the telephone. When contact is made, the interviewer reads the questions posed on the screen and records the respondent's answers directly into the computer by use of a keyboard or touch sensitive screen.

Telephone Survey Methods: Advantages and Disadvantages

Advantages: Regardless of how telephone surveys are administered, the advantages are the same. First, the telephone is a relatively inexpensive method to collect survey data for large sample sizes compared to personal survey methods because the time involved in traveling to and locating respondents is eliminated. A second advantage of the telephone survey is that it has the potential to yield a high-quality sample if random digit dialing procedures and correct call-back measures are employed. A third advantage is that telephone surveys have quick turnaround times.

Disadvantages: An obvious shortcoming of telephone surveys is the inability to employ visual aids or complex tasks. A second disadvantage is that the telephone survey does not allow the interviewer to make various judgments and evaluations of the respondent. For instance, the telephone survey does not allow for the observation of body language and facial expressions. A third disadvantage is that the type and amount of information that can be obtained is limited. Very long interviews are inappropriate for the telephone, as are questions with long lists of response categories. Lastly, there is the possibility of sample bias which is a consequence of some people being without phones, having unlisted phone numbers, and telephone directories being unable to keep up with a mobile population.

A summary of the advantages and disadvantages of telephone-administered survey methods is provided in Table 9.

Table 9 Advantages and disadvantages of telephone-administered surveys

Advantages	*Disadvantages*
Relatively inexpensive for large sample sizes	Visual aids cannot be employed
Quality samples	Respondent is unobservable
Efficient	Question length and type limited
	Possible sample bias

3. Electronic Survey Methods

An electronically administered survey is one in which questions are administered to respondents via an electronic medium. Since the late 1990s, electronic survey methods have grown in popularity. There are two variations of electronic survey methods: email surveys and internet surveys.

Email Survey

Email is a system for transferring messages and files from computer to computer. To conduct an email survey, a list of email addresses needs to be obtained. The survey may be typed in the body of the email massage, or a questionnaire may be attached that is designed using a common word processing package. Respondents answer the questions and then email their responses back to the researcher. A computer program may be used to prepare the questionnaire, the email address list, and to extract data from the replies.

Internet (or Web based) Survey

In contrast to email surveys, internet surveys are posted on a web site. Respondents may be recruited on-line from potential respondent databases or they can be recruited by conventional methods (e.g. mail and telephone). Respondents are asked to visit a particular web location to complete the survey.

Electronic Survey Methods: Advantages and Disadvantages

Advantages: The rising popularity of electronically administered survey methods over the last decade is due to a number of reasons. First, there is the speed with which a questionnaire can be created, distributed to respondents, and the data returned. Since printing, mailing, and data entry delays are eliminated, the response time for receiving data is very quick. Data are obtained in electronic form, so statistical software can be programed to process standard questionnaires and return statistical summaries and graphics automatically. A second advantage of electronic surveys is the cost savings. Printing, mailing, data entry, and interviewer costs are eliminated, and the incremental costs of each respondent are typically low, so studies involving large sample sizes can be done at substantial savings. A third advantage is flexibility because electronic surveys can be completed in one's own time and place. A fourth advantage of electronic surveys administered on the internet is that they can be made visually pleasing with attractive fonts and graphics.

Disadvantages: The first disadvantage is that email and internet users are not representative of the population as a whole and so it is difficult to apply random statistical sampling procedures. A second problem relates to security and privacy concerns with accessing email messages and providing personal information on the internet. These concerns are, however, being addressed with security pin numbers. A further disadvantage is the verification of who is actually responding to the survey.

A summary of the advantages and disadvantages of electronically administered surveys is presented in Table 10.

Table 10 Advantages and disadvantages of electronically administered surveys

Advantages	*Disadvantages*
Quick response time	Inadequate samples
Flexibility	Security and privacy issues
Cost savings	Verification of data
Visually appealing	

4. Mail Survey Method

A mail-administered survey is one in which questionnaires are mailed to potential respondents. A typical mail survey package consists of a cover letter, questionnaire, reply-paid envelope, and possibly an incentive. The respondents are asked to complete and return the questionnaire by mail.

Mail Survey Method: Advantages and Disadvantages

Advantages: The first advantage of mail surveys is that they are relatively cheap. Because mail surveys are completed without an interviewer there are significant cost savings. The second advantage is that respondents can control the pace at which they respond. A third advantage is that there is no interviewer-evaluation apprehension. Because the mail survey approach is self-administered, respondents may feel more at ease. A fourth advantage is that, because the survey is answered at the respondent's own discretion, the replies are likely to be more thoughtful.

Disadvantages: Mail surveys are subject to the possibilities that respondents will not complete the survey, will answer questions erroneously, will not respond in a timely manner, or will refuse to return the survey at all. The major reason for these disadvantages is that no opportunity exists to monitor or interact with the respondent during the course of the survey. Furthermore, due to the absence of an interviewer, the burden of respondent understanding falls on the questionnaire itself. Mail surveys must, therefore, have clear instructions throughout.

A summary of the advantages and disadvantages of mail-administered surveys is provided in Table 11.

Table 11 Advantages and disadvantages of mail-administered surveys

Advantages	*Disadvantages*
Low cost	Low response rates
Flexibility	Little control over survey
Thoughtful responses	Respondent burden

3.2.1.3 Step 3: Compare and evaluate survey modes of data collection

To determine which methods are most appropriate for a given situation, an evaluation of each method of data collection needs to be undertaken. The choice of data collection method is a critical decision in the research process. The decision is seldom easy as there are many factors to consider. Table 12 compares the four main modes of data collection across a variety of factors. The relative importance attached to these factors will vary for each particular survey.

Diversity of Questions

The diversity of questions that can be asked in a survey depends on the degree of interaction the respondent has with the interviewer and the questionnaire, as well as the respondent's ability to actually view the questions. A wide variety of questions can be asked in a personal interview because the respondent can view the questionnaire and an interviewer is present to clarify ambiguities. In electronic surveys, multimedia capabilities can be utilised and so the ability to ask a diversity of questions is moderate to high, despite the absence of an interviewer. In mail surveys, less diversity is possible. In telephone surveys, the respondent cannot view the questionnaire while answering and this limits the diversity of questions.

Table 12 A comparative evaluation of survey modes of data collection

Criteria	*Personal surveys*	*Telephone surveys*	*Electronic surveys*	*Mail surveys*
Diversity of questions	High	Low	Moderate/High	Moderate
Flexibility of data collection	High	Moderate/High	Low/Moderate	Low
Use of physical stimuli	Moderate/High	Low	Moderate	Moderate
Sample control	High	Moderate/High	Low/Moderate	Low
Control of data collection environment	Moderate/High	Moderate	Low	Low
Quantity of data	High	Low	Moderate	Moderate
Perceived anonymity of respondent	Low	Moderate	High	High
Social desirability	High	Moderate	Low	Low
Obtaining sensitive information	Low	High	High	High
Potential for interviewer bias	High	Moderate	None	None
Speed	Moderate	High	High	Low
Cost	High	Moderate	Low	Low

Adapted from McDaniel and Gates (1999), Aaker, Kumar and Day (2000), and Malhotra et. al (2002).

Flexibility of Data Collection

The flexibility of data collection is determined primarily by the extent to which the respondent can interact with the interviewer and the survey questionnaire. The personal interview, whether conducted in-home or at a central location, allows the highest flexibility of data collection. Because the respondent and interviewer meet face to face, the interviewer can administer complex questionnaires; explain, clarify and encourage a response to difficult questions; and even utilise unstructured techniques. The telephone interview, by contrast, allows only moderate flexibility, because it is more difficult to use unstructured techniques, ask complex questions or obtain in-depth answers to open-response questions over the telephone. Electronic surveys, particularly those posted on the internet, allow greater flexibility because the questionnaire is administered in an interactive mode. Mail surveys do not have an interactive interface, and so tend to be the least flexible method of data collection.

Use of Physical Stimuli

Often is it helpful or necessary to use physical stimuli (e.g. photographs, maps) during the interview. If physical stimuli are to be used, personal survey methods are the most appropriate because of the face-to-face contact between interviewer and respondent. Mail and electronic surveys are moderately appropriate on this dimension because it is sometimes possible to mail or email the facilitating aids. The use of physical stimuli in telephone surveys is obviously low.

Sample Control

Sample control is the ability of the survey mode to reach the sample units (e.g. individuals, households) effectively and efficiently. In principle, personal surveys offer the best sample control because it is possible to control which sampling units are interviewed, who is interviewed, the degree of participation of other members of the household and many other aspects of data collection. Moderate to high sampling control can be achieved with telephone surveys. Telephones offer access to geographically dispersed respondents. While the telephone has achieved almost total penetration of households in Australia, there are some variations by region and within regions. Mail surveys require a list of addresses of individuals or households eligible for inclusion in the sample. However, mail listings can sometimes be unavailable, outdated or incomplete. Typically, telephone or electoral rolls are used for a listing of the general population. Further factors outside of the researcher's control with mail surveys are whether the questionnaire is answered and who answers it. Some subjects refuse to respond because of lack of interest or motivation; others cannot respond because they have a low reading age. For these reasons, the degree of sample control in mail surveys is low. Not all populations are candidates for electronic survey modes. At present, the general population is often a poor fit because not all Australian households have home access to the internet. The biases in this population are towards the higher income earner and those who have children less than eighteen years of age in the household. Although respondents can be screened to meet qualifying criteria and quotas can be imposed, the ability to meet quotas is limited by the number and characteristics of respondents who visit the web site in question.

Control of the Data Collection Environment

The degree of control the researcher has over the environment in which the respondent answers the questionnaire is another factor that differentiates the various survey modes. Personal surveys offer moderate to high control because an interviewer is present. The telephone survey method offers moderate control. Although the interviewer cannot see the environment in which the interview is being conducted, background conditions can be sensed, and respondents can be encouraged to be attentive and involved. In electronic and mail surveys, the researcher has little control over the data collection environment.

Quantity of Data

The quantity of data that can be obtained varies between survey methods. Personal survey methods allow the researcher to collect large amounts of data. The social relationships between the interviewer and respondent, as well as the home environment, motivates the respondent to spend more time in the interview. Because the interviewer records answers to open-response questions and provides visual aids to assist with lengthy questions with complex scales, less effort is required of the respondent in a personal survey than in a telephone or mail survey. Mail and electronic surveys can also yield moderate amounts of data. Medium length questionnaires can be used, because short questionnaires have not been shown to generate higher response rates. Telephone surveys provide limited amounts of data.

These surveys commonly last around 15 minutes, although longer surveys may be conducted when the subject matter is of interest to the respondent.

Perceived Anonymity

Perceived anonymity refers to the respondents' perceptions that the interviewer or researcher will not discern their identities. Perceived anonymity is high in electronic and mail surveys because there is no contact with an interviewer while responding. It is low in personal surveys due to face-to-face contact with the interviewer. Telephone surveys offer moderate anonymity. While there is no contact with the interviewer, respondent's names and contact details are known.

Social Desirability

Social desirability is the tendency of the respondents to provide answers that are socially acceptable, whether or not they are true. As electronic and mail surveys do not involve any interaction between the interviewer and respondent, they are least susceptible to social desirability. Such methods are suited to obtaining sensitive information such as that related to financial or personal behaviour. Telephone surveys are moderately good at avoiding socially desirable responses. They are suited to obtaining sensitive information, as respondents have the perception that they are not committing to anything in writing over the telephone. Personal surveys are limited in this respect, due to the interaction between interviewer and respondent.

Potential for Interviewer Bias

An interviewer can bias a survey by the manner in which respondents are selected, research questions are asked, and responses are recorded. The extent of the interviewer's role determines the potential for bias. Personal surveys are highly susceptible to interviewer bias. Telephone surveys are less susceptible. For example, with inflection and tone of voice, interviewers can convey their own attitudes and thereby suggest answers. Electronic and mail surveys are not subject to interviewer bias.

Speed

Electronically administered surveys are the quickest method of data collection when surveying a large number of respondents. First, there is the speed at which a questionnaire can be created, distributed to respondents, and the data returned. Telephone surveys are also a fast method of data collection. When a central telephone facility is used, several hundred telephone interviews can be completed per day. Data for large national surveys by professional market research companies can be collected in one week or less. Personal surveys are slower because of the time involved between interviews. To expedite data collection, interviews may be conducted simultaneously using many interviewers. Mail surveys are typically the slowest method. It usually takes several weeks to receive completed questionnaires; follow-up mailings take even longer.

Cost

For large samples, the cost of electronic surveys is the lowest. Printing, mailing, data entry and interviewer costs are eliminated, and the incremental costs per respondent are typically low, so studies with large sample sizes can be done at substantial savings compared to mail, telephone or personal surveys. Personal surveys tend to be the most expensive mode of data collection per completed response. In general, electronic, mail, telephone and personal surveys require progressively larger survey teams and greater supervision and control. Hence, the cost tends to increase in this order (see Table 13). However, relative costs depend on the subject of inquiry and the procedures adopted.

Table 13 Relative survey costs (August 2001)

Survey mode	*Description*	*Cost per survey index/N=sample size*	
Electronic Survey			
Cost effective for large samples only, due to initial set up costs	WWW survey; unsolicited with invitation to reply; small incentive offered; no sample list management needed; 10-minute self-completion questionnaire	N=150 responses 0.9	N=1000 responses 0.15
Mail Survey			
Cost effective for large samples, however, low response rates necessitates high mailing charges Incentive helps generate reasonable response rate	30% response rate; 10-minute self-completion questionnaire; incentive offered; high quality mailing list; large initial sample; no additional mailings	N=150 responses 0.7	N=1000 responses 0.5
Telephone Survey			
Interview length impacts on cost, however, qualifying rate causes higher costs	15-minute interview; national study	N=150 interviews 1.8	N=1000 interviews 1.6
Personal Survey			
Interview length, limited window for interviewing and interviewer travel charges impacts on costs	30-minute interview; 100% qualifying incidence	N=150 interviews 2.8	N=1000 interviews 2.2

Source: Malhorta et. al (2002: 249)

3.2.1.4 Step 4: Select the most appropriate method

As is evident from Table 12, and the preceding discussion, no survey method is superior in all situations. Depending on factors such as information requirements, resource constraints (time and money), and respondent characteristics, none, one, two or even all methods may be appropriate. Although the survey modes have been presented separately, they are not mutually exclusive. Rather, they can be employed in a complimentary fashion to build on each other's strengths and compensate for each other's weaknesses.

Of the four modes of data collection described, telephone and electronic modes are the least suited methods for collecting visitor data on-site. Telephone surveys are most appropriate when large samples of the general population are required, and are best administered by professional polling companies. For general survey research, electronic survey methods are limited at present because of their limited penetration in terms of internet and email access in the general population. For the period during which email and internet penetration is increasing its use for survey research, its application will be restricted to those population groups in which the number of email and internet connections are high (e.g. high-income groups).

The most appropriate methods for administering visitor surveys on-site is the personal survey method, and a combination of personal and mail surveys, otherwise known as the personal intercept and mail-back method. The personal survey method is interviewer-administered, and thus requires respondents to be stationary for the period of the survey (usually between 10 and 15 minutes). In contrast, the personal intercept and mail-back method is essentially a self-administered survey. This method

involves two stages. First, visitors are intercepted and asked if they would like to participate in the survey. Second, those respondents who are willing to participate in the survey are asked to complete a mail-back questionnaire at the end of their visit. This method has been applied successfully by the United States National Park Service (see Machlis, Bergerson, and Littlejohn 1999; Littlejohn 2000; Machlis 2000) and in several studies of visitors to a diversity of natural areas in New South Wales and Queensland (see Horneman 2001a, 2001b, 2001c, 2001d, 2001e and 2002).

3.2.1.5 Step 5: Determine survey questions

Surveys are composed of questions that are designed to answer the research objective or research questions/hypotheses. The choice of question to be included in a survey is determined by what the researcher is seeking to understand about visitors to the area in question. Research questions can be categorised according to the number of variables included in the question. For instance, first order questions contain a single variable. Second order questions contain two variables, while third order questions contain three variables and so on. The following examples illustrate the relationship between research questions and survey questions.

First order research question

Research question: What proportion do males and females comprise of the visitor base?

Survey question: This requires the gender question in the survey.

Second order research question

Research question: What proportion do first-time, male visitors comprise of the visitor base?

Survey question: This requires questions on frequency of visit and gender to be included in the survey.

Third order research question

Research question: What proportion of first-time, male visitors prefer longer walks?

Survey question: This requires questions on frequency of visit, gender, and activity to be included in the survey.

As a general rule, every question in a questionnaire should contribute to the information needed (as determined by the research objective and research questions) or serve some specific purpose. If there is no satisfactory use for the data resulting from a question, that question should be omitted.

Types of Survey Questions

Surveys typically contain questions that are designed to collect information about the following behavioural attributes: who, what, when, where, and why. In this Manual, the types of questions to be included in a visitor survey can be divided into three types, described as modules:

1. **Core questions module**. The questions contained in the core module must be included in every visitor survey (see Part 4). The core questions that are of interest to all natural resource management and land agencies were identified in a series of workshops. The core questions serve as a benchmark against the Australian Bureau of Statistics standard demographic questions and provide a baseline for comparing data across temporal and spatial scales.

2. **Question bank module.** The question bank module contains seven sub-modules containing questions relating to the following aspects:

    - Visitor characteristics
    - Travel characteristics
    - Nature of the visit
    - Interpretation and education
    - Visitor spending
    - Visitor satisfaction
    - Natural area management

    Each sub-module has two components. The first component contains standardised visitor survey questions (see Part 5) that have been tested and validated in a round of pilot surveys in New South Wales and Queensland (see Horneman 2001a, 2001b, 2001c, 2001d, 2001e, 2002).

    The second component of each sub-module contains best practice questions chosen from a comprehensive review of visitor surveys and workshops with staff from various natural resource and land management agencies. They have not been validated during the development of this Manual. All best practice questions and their formats use either Australian Bureau of Statistics or known best practice categories (see Part 6).

3. **Customised questions module.** The customised module recognises that additional questions, not included in the core or question bank modules, may need to be included in surveys to address issue, site- or agency-specific topics. Before choosing to design and insert a customised question into a survey, make sure that the answer cannot be obtained by combining answers from questions contained in the core and question bank modules.

The typical survey will therefore contain the core questions from the Core Questions Module (Part 4), standardised questions selected from the Question Bank Module (Part 5), best practice questions selected from the Question Bank Module (Part 6), and customised questions, if information on a particular issue is needed and cannot be obtained from the questions in the Question Bank Modules.

Guidelines for Constructing Customised Questions

Considerable attention must be given to developing clear, unambiguous and useful questions. The wording, format, and presentation of survey questions is therefore crucial. The basic goal in constructing questions is to create a question that provides a standardised stimulus to all respondents and provides a systematic way of recording answers.

The Basics of Question Design: Some General Principles

The following discussion is organised as a series of questions that should be asked about each customised question to be included in a visitor survey. For a comprehensive discussion on wording survey questions see Dillman (1978), Babbie (1990), Fowler (1993), de Vaus (1995), and West (1999).

- **Will the words be uniformly understood?**

To make a question mean the same to everyone it is important to keep the wording as simple as possible. The challenge is to choose words that are understood by all respondents in the target group. The number of syllables in a question is not a perfect indication of the complexity of difficult words, but it provides a good guideline. As a general principle shorter words are preferable to longer words. For example, "tired" could be substituted for "exhausted", and "help" could be substituted for "assistance". A thesaurus is a useful tool for finding synonyms that might be used.

- **Do the questions contain abbreviations or unconventional phrases?**

The use of abbreviations, jargon, or slang should be avoided when designing survey questions. The meaning of such terms is often confused and thus should be avoided, unless they add something that can be better communicated. For example, the majority of people working in natural area management would be familiar with the IUCN abbreviation, however, most people in the community would not understand what IUCN means.

- **Are the questions vague?**

A common error in question wording is failing to provide the respondent with an adequate frame of reference in time and space for interpreting the question. For example, words such as "often", "occasionally", and "usually" lack an appropriate time reference, so respondents choose their own, with the result that answers are not comparable.

- **Is the question unnecessarily detailed?**

The desire to avoid vagueness sometimes results in questions being so precise that people are unable to answer them. For example, questions about personal or household income can create problems. Since we generally do not need precise data on income, the problem can be diffused by asking respondents to place themselves in income categories (for example, see section 6.1, question 9).

- **Is the question biased?**

A biased question is one that influences people to respond in a manner that does not accurately reflect their position on the issue under investigation. Some respondents will refuse to answer a question that appears to be biased in a particular way. Others may be negatively affected by the wording so they intentionally respond with an answer that does not reflect their actual opinion, while others may be unaware that a question is biased and may be influenced to respond in the direction encouraged by the wording. Biased questions imply that the respondent should have a particular opinion, for example, "Most people agree that a fee should be paid to access national parks. Do you agree? Yes/No". Respondents who are concerned about being different from other people may be influenced to answer "yes" to this question, even though they may not agree with the statement.

- **Is the question leading or loaded?**

A leading question is one that clearly suggests the answer or reveals the researcher's opinion. For example, questions can be leading by using such phrases as "Do you agree that..." A loaded question introduces a more subtle bias. A common type of loading of responses is through failure to provide a full range of response categories. If the full range of response categories cannot be provided because the list is too long, the alternative is to ask a partially closed question. Such questions typically offer a number of answer responses followed by an "other (please specify)" option (for example, see section 5.3, questions 1 and 5). A second form of loading is the use of emotionally charged words that have such strong positive or negative overtones they overshadow the specific content of the question. For example, words such as "environmentally-friendly", "green", "natural" tend to be viewed favourably, whereas words such as "pollution", "waste", "poverty" tend to induce feelings of hostility.

- **Is the question objectionable?**

There are several reasons that respondents find questions objectionable. The most frequent reason is when the information requested is considered personal (for example, "how much money did you earn last year?"). To make objectionable questions such as personal or household income less of a problem, use broad response categories that allow respondents to verbalise information they prefer not to divulge (for example, see section 6.1, question 9).

- **Is it a double-barrelled question?**

Double-barrelled questions ask more than one question at once. The result is an ambiguous question that produces an ambiguous answer. For example, double-barrelled questions occur when a respondent can answer or agree with one part of a question but not the other, or cannot answer at all without accepting a particular assumption. For example, the question "how often do you visit your parents?" is double-barrelled. Separate questions about a person's mother and father should be asked.

- **Is the respondent likely to have the necessary knowledge?**

Questions typically assume that the respondent possesses a certain amount of knowledge. For example, a question which asks "Do you agree or disagree with the government's policy on protected species?" is unsatisfactory. For issues where there is doubt, the solution is to ask a qualifying or filter question and limit further questioning to those who qualify.

- **Does the question artificially create opinions?**

On certain issues people will have no opinion. It is therefore important to offer people the option of responding "no comment", "not applicable", "don't know" or "no opinion". Although this can lead to some people giving these responses to most questions, not including such options can produce highly unreliable and therefore useless responses.

- **Is the question an appropriate length?**

It is not always the case that shorter questions are better, although one common rule of thumb is to keep the number of words in any question under twenty. Under certain circumstances a question may have to be long to avoid ambiguity but these should be the exception rather than the rule.

Question Format

Another decision in constructing survey questions is to determine question format. Two general question formats can be identified: open-response questions and closed-response questions. Both question formats require respondents to engage in a different kind of response behaviour and have certain advantages and disadvantages.

Open-response questions

Open-response questions have no answer choices from which respondents select their response. Instead, respondents must create their own answers and state them in their own words. The advantages of open-response questions stem from the range of responses that can be obtained, and the lack of influence in the responses from pre-specified categories. Because of these advantages, open-response questions are useful in the following circumstances:

- when it is valuable to measure the importance of an issue;
- when there are too many possible responses to be listed, or they cannot be foreseen;
- when verbatim responses are desired to add substance to answers or to cite as examples in a report; and
- when the behaviour to be measured is sensitive, or disapproved of.

The major disadvantage with open-response questions is that variability in the clarity and depth of responses depends on the articulateness of the respondent, and the interviewer's ability to record the verbatim answers quickly. Open-response questions are also time consuming. Classifications must be established to summarise the responses, and each answer must be assigned to one or more categories. This involves subjective judgments that are prone to error and bias. To minimise this error, normal practice is that two editors independently categorise the responses and compare their results. In addition, respondents may not always use the same frame of reference when answering an open-response question, which may not be easily discernable by the researcher.

Open-response questions are generally used in two situations. The first situation is where respondents can express themselves freely (for example, see section 5.3, questions 2 and 3). Open-response questions of this type are used when the researcher cannot anticipate the various ways in which people are likely to respond. They are used to stimulate free thought, solicit suggestions, probe people's memories, and clarify positions. However, open-response questions of this type also exhibit some problems. The biggest disadvantage is that these kinds of questions can be very demanding. Another frequent disadvantage of open-response questions that encourage free expression is the difficulty of constructing meaningful variables for statistical analysis.

The second situation is when the researcher would like to elicit a precise piece of information that respondents can recall without difficulty and listing all of them would increase the difficulty of answering. This type of open-response question is not designed to encourage free expression. It seeks a specific fact, usually (but not always) a behaviour or attribute that is known to the respondent. The only barrier to providing answer categories is that it would be unnecessarily time consuming for the respondent. For example, most people can name the state or country in which they live, making it unnecessary to read through a list of perhaps 50-100 items to find the answer. These questions are not without their problems. Sometimes people can't recall all the possible answers, and under-enumeration becomes a problem. Second, people do not always hear or read questions correctly.

Closed-response questions

Closed-response questions are accompanied by the presentation of responses to be considered by the respondent. The advantages of closed-response questions stem from the time and effort required by the respondent to answer the question. Closed-response questions are easier to answer, require less effort by the interviewer, and make tabulation and analysis easier. There is less potential error due to differences in the way questions are asked and responses recorded. The most significant advantage of these questions is that answers are directly comparable from respondent to respondent.

There are, however, significant limitations to closed-response questions. One area of controversy is whether or not middle alternatives should be included in the questions. Secondly, the very nature of closed responses provides fewer opportunities for self expression or subtle qualifications. Finally, the list of alternative response categories provides answers that might not have been considered by respondents, who are often reluctant to admit their ignorance of an issue.

Closed-response questions can be classified into three broad types:

- closed-response questions with ordered answer choices,
- closed-response questions with unordered answer choices, and
- partially closed-response questions.

Closed-response questions with ordered answer choices

The feature that distinguishes closed-response questions with ordered answer choices from all other forms of questions is that each choice represents a gradation of a single dimension of some concept. This question structure is ideally suited for determining such things as intensity of feeling, degree of involvement, and frequency of participation (for example, see section 5.2, questions 1 and 2). Questions with ordered choices tend to be quite specific. To answer these questions, respondents must identify the response dimension that underlies the answer choices and place themselves at the most appropriate point along a scale that is implied by the answer choices. Questions of this nature are appropriate when the researcher has a well-defined issue and knows what dimensions of thought are required for the respondent to provide an answer. Researchers find this question structure attractive for asking a series of belief and attitude questions when their goal is to combine answers to form a multiple item scale. Such questions in a questionnaire often use the same type of answer choices (e.g. strongly agree to strongly disagree) for many items.

Closed-response questions with unordered answer choices

Closed-response questions with unordered answer choices do not restrict respondents to choosing among gradations of a single concept. Rather, each choice is an independent alternative representing a different concept. To answer questions with unordered answer choices it is necessary to evaluate individually each alternative in relation to every other one. Questions of this type are often used to establish priorities among issues (for example, see section 5.3, questions 4 and 5). Because respondents have to balance several ideas in their minds at the same time, these questions are generally more difficult to answer than those containing ordered answer choices.

The shortcomings of questions with unordered answer responses are quite similar to those of questions with ordered answer choices. Unless the researcher's knowledge of the subject allows meaningful answer choices to be stated, useful results cannot be obtained. The most frequent criticism is that the preferred options of all respondents are not stated. This shortcoming can be overcome by the use of the question structure described next.

Partially closed-response questions

The fear that certain options may be overlooked by researchers has led to the widespread use of the partially closed-response question. Typically, such questions offer a number of answer responses followed by an "other (please specify)" option (for example, see section 5.3, questions 1 and 5). This format is almost always limited to unordered, closed-response questions. Although this format is often used, a sufficient number of additional responses are seldom obtained to warrant their inclusion in the planned analysis. The majority of respondents usually select one of the offered categories rather than create their own. However, turning a closed question into one that is partially closed may provide very useful information. If, for example, a number of respondents insist that none of the categories adequately describes their response, it can be assumed there are numerous others who, although they did not choose the open-response version, probably chose one of the closed-response versions reluctantly. In short, an unusually high number of volunteered responses to partially closed questions suggests a problem and that an evaluation must be made before reaching conclusions.

Measurement scales for presenting closed-response categories

To measure closed-response categories, a variety of scaled-response measurements are available. The measurement scales vary according to the type of information that can be obtained. Measurement scales are grouped into four main types:

> **Nominal scales** are those whose numbers serve only as labels or tags for identifying and classifying objects with strict one-to-one correspondence between the numbers and the objects. Gender, for example, is a nominal variable comprised of the categories male and female. The categories comprising a nominal variable are mutually exclusive.
>
> **Ordinal scales** reflect a rank order among the categories comprising a variable. An example of an ordinal variable is household income. Although such measures are often represented by numbers on an index or scale, these numbers have no meaning other than the indication of rank order.

Interval scales are those in which the distance between each descriptor is known, and thus have more meaning than ordinal scales. The distance is normally defined as one scale unit. For example, if a respondent is asked to rate the management of an area on a seven-point scale (1=very poor and 7=very good), because the descriptors are evenly spaced on a continuum and the numbers are equal distances apart, the results would be intervally scaled. By wording or spacing the response options on a scale so they appear to have equal intervals between them, the researcher achieves a higher level of measurement than ordinal or nominal scales.

Ratio scales are ones in which a true zero origin exists, such as age, the actual amount of dollars spent, or kilometres travelled in a certain time period. This characteristic allows the researcher to construct ratios when comparing results. For example, comparisons that one visitor has travelled twice as far as another visitor can be made.

An understanding of the level of measurement a scale possesses is important for two reasons. First, the type of measurement scale used in closed-response questions dictates the type of information that can be obtained. For example, nominal scales allow the researcher to identify the object of study on some property, while ratio scales allow direct comparisons to be made between objects. Second, the level of measurement dictates the type of statistical analysis that can be performed. Low-level scales necessitate low-level analysis whereas high-level scales permit more sophisticated analysis (see section 3.2.4.3).

As a general principle, it is desirable to construct a scale at the highest appropriate level of measurement possible. Appropriateness is determined by the properties of the object being studied and, to some extent, by the mental capabilities of potential respondents. High-level measurement scales can always be collapsed to a lower-level; however, it is practically impossible to go to a higher level once the data are collected. For example, the intensity of disagreement represented by responses such as "strongly disagree" and "somewhat disagree" on an interval scale can be collapsed into a "disagree" category for a nominal scale, but the reverse does not apply.

Several standard scaled-response formats for measuring the psychological aspects of human behaviour have been designed for closed-response questions. Question scales and response formats should be as consistent as possible to assist with survey continuity and flow. The most common scaled-response formats for measuring psychological constructs include the Likert Scale, the Semantic Differential Scale, and the Rank Order Scale. These are briefly described below. For a more comprehensive review see Babbie (1990), Veal (1997), Aaker, Kumar and Day (2000), and Burns and Bush (2000).

Likert scale formats. This scaling approach asks respondents to indicate their degree of agreement or disagreement with a proposition on a symmetric agree-disagree scale. Likert scales capture the intensity of feelings towards a particular object. For example:

Please indicate your level of agreement with the following statement: The walking tracks are well maintained. *(Tick one box only)*

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
☐1	☐2	☐3	☐4	☐5

Semantic differential scale formats. The semantic differential scale contains a series of bipolar (or opposite) adjectives on a 5- or 7-point scale for the various properties of the object under study. Respondents indicate their impressions of each property by indicating locations along its continuum. The focus of the semantic differential is on the measurement of the meaning of an object, concept, or person.

The construction of a semantic differential scale begins with the determination of a concept or object to be rated. The researcher then selects bipolar pairs of words or phrases that could be used to describe the object's important properties. The opposites are positioned at the endpoints of a continuum of intensity. The respondent then indicates their evaluation of the performance of the object, by placing a tick along the line. The closer the respondent ticks to an endpoint on a line, the more intense is their evaluation of the object being measured. For example:

For each criteria listed below, how would you describe this area? *(Place a tick along each line)*

Developed _____|_____|_____|_____|_____ Natural

Clean _____|_____|_____|_____|_____ Unclean

Crowded _____|_____|_____|_____|_____ Uncrowded

Rural _____|_____|_____|_____|_____ Urban

Rank order scale formats. These scales require the respondent to arrange a set of objects with regard to a common criterion. Rank-order scales are useful if a researcher is interested in how respondents rank alternatives. As a rule of thumb, respondents should not be asked to rank more than five or six items. For example:

Please rank the following sources of information in terms of their importance for planning your visit to this area.

	Rank
Word of mouth	_____
Travel/guide books	_____
Newspaper/magazines	_____
Road sign/maps	_____

Number of response categories

The response categories provided in closed-response questions should be mutually exclusive and exhaust the possibilities. However, as highlighted earlier, sometimes it is neither possible nor desirable to include all possible alternatives. The number of response categories varies with attitudinal scales. As a general rule, the range of opinion on most cases can be best captured with five or seven categories. Five categories are the minimum needed to discriminate effectively among individuals. Although a seven-point or nine-point category scale is more precise and discriminating, respondents are more likely to get confused.

Presenting a "don't know" category

The inclusion of a "don't know" category is dependent on the type of question asked. When knowledge-type questions are being asked, a "don't know" response should be provided. Also, as the object of the question is further removed from people's lives, the more plausible and reasonable it is that some respondents will not have adequate knowledge on which to base an answer or will not have formed an opinion or feeling. However, in some instances it may be relevant and useful to know how many "don't know". When asking attitudinal questions, the "don't know" is sometimes equivalent to no opinion, or sometimes it means respondents have mixed feelings about the issue under investigation.

There are two approaches to dealing with respondents who may not have adequate knowledge or an opinion on the topic. The first approach is to ask the question of all respondents, relying on the respondent to volunteer a "don't know" answer. The second approach is to ask all respondents a standard screening question about their familiarity with the topic.

Open-response Versus Close-response Questions: Which is Best?

The choice of open or closed questions is dependent on many factors including question content, respondent motivation, method of administration, type of respondents, access to skilled coders to code open-response answers, and the amount of time available to develop a set of unbiased responses. The following guidelines are recommended for choosing between open and closed structure questions:

- a closed question to see if the respondent has thought about or is aware of the issue under study;
- an open question to develop an understanding of general feelings on the matter;
- a closed question to develop an understanding of specific aspects of the issues under study;
- open or closed questions to find out respondents' reasons for their opinions; and
- closed questions to find out how strongly an opinion is held.

3.2.1.6 Step 6: Establish questionnaire layout and flow

After the questions have been properly formulated, the next step is to develop a layout of the questionnaire and determine how the questions are to be presented and sequenced. A copy of a visitor survey administered at Kondalilla National Park (Horneman 2001d) is presented in Appendix II, as an example of questionnaire layout and flow.

Components of the Questionnaire

Each questionnaire should contain the following:

- a logo of the agency undertaking the research;
- a title;
- an introduction to the survey which explains the purpose of the survey, and potential application of the information collected; and
- instructions for completing the questionnaire. The instructions should inform the respondent and/or the interviewer about who should complete the questionnaire, confidentiality, length of time required, and directions about what to do with the survey once completed.

Questionnaire Layout

When combining questions into a questionnaire, the following issues need to be considered:

Ordering the questions

The order of questions will initially be determined by the need to gain and maintain the cooperation of the respondent and make the questionnaire as easy as possible. For a more detailed discussion on ordering survey questions, see Dillman (1978), Babbie (1990), de Vaus (1995), Aaker, Kumar and Day (2000), and McDaniel and Gates (1999). The following guidelines are recommended for ordering survey questions:

- Begin the questionnaire with an easy and non-threatening question. This helps to establish rapport and build the confidence of the respondent in his or her ability to answer. The initial questions should be obviously relevant to the stated purpose of the survey.
- The questionnaire should flow smoothly and logically from one topic to the next. Questions that are similar in content should be grouped, easing the mental effort required for constantly switching from one kind of question to another. When a new topic is introduced, a transition statement or question should be used, explaining how the new topic relates to what has been discussed previously or to the purpose of the study.
- For most topics it is better to proceed from broad, general questions to the more specific. This funnel approach helps the respondent put the question in a broader context and provide a more thoughtful answer.
- Open-response questions should be kept to a minimum and where possible placed towards the end of the questionnaire.
- Sensitive or difficult questions should not be placed at the beginning of the questionnaire. Rather, they should be introduced at some point where the respondent has developed trust in the study. Demographic questions (i.e. questions that elicit personal information such as age, gender, and income) should be placed at the end of the questionnaire.

Choosing the first question

The ordering principles already discussed suggest that the first question be clearly related to the purpose of the survey. To increase the likelihood that all who read the first question will answer it and continue answering the questions that follow, the following criteria need to be addressed:

- The first question should be easy so that virtually all respondents need only a few seconds to comprehend it and another few seconds to answer it. As such, open-response questions are never used. Long closed-response questions with lengthy answer choices should also be avoided.
- The opening question must convey a sense of neutrality. Any question that might suggest that the researcher leans toward a particular view is to be avoided. Therefore, the questionnaire should never begin with statements that ask respondents to express their agreement or disagreement. It is better to locate such questions later in the questionnaire so that they will be viewed in the context of several other questions, rather than as the only indicator of the subject of the study.

- The first question should be applicable to all respondents. Any question that logically requires a "does-not-apply" category should be avoided early in the questionnaire. Such responses may lead the respondent to conclude that all of the remaining questions do not apply, a convenient excuse for going no further.
- The opening question should also be interesting to all respondents. While finding such a question may be difficult in surveys of the general public, it is usually possible to construct a question that is related to the stated purpose of the survey and arouses a fair amount of interest.

Presenting the Questions

The presentation of questions requires attention for a number of reasons. The presentation of survey questions is particularly important for self-administered modes of data collection. First, the questionnaire must be aesthetically pleasing and look easy to do to motivate respondents to complete it. At the same time, the structure of precisely worded questions must be preserved. Third, the pages must be constructed in such a manner that keeps respondents from skipping individual items or whole sections. To accomplish all three goals, the following principles are recommended.

- **Identify answer categories on left, with numbered boxes**

Numbering the boxes for each response category provides a convenient form of pre-coding. This pre-coding is only possible for closed-response questions (for example, see section 5.2, Question 1). The answer boxes are placed to the left of the answer for two reasons. First, some answer categories are longer than others and placing the numbers to the right would result in them being located some distance away from the answer, increasing the chance of error. Second, respondents who choose certain answers are sometimes asked to give additional specification or explanation. It is more convenient to ask for specification to the right of the answer without having to extend answer boxes even further away to provide the needed space for writing. Although for some questions it makes little or no difference on which side the numbers are placed, the importance of consistency and the likelihood that the questionnaire will contain many different types of answer categories makes this a rule that should be followed without exception.

- **Establish a vertical flow**

The answer categories should be arranged so that answers are registered in a vertical line on each page. The purpose of vertical flow is to prevent inadvertent omission, which often occurs when respondents are required to move back and forth across the page with their answers. Presenting answers in a vertical flow pattern also prevents the common error of ticking the space on the wrong side of the answers when answer categories are placed beside one another rather than underneath. Another reason for adopting a vertical flow pattern is that it appears to have the positive psychological effect of enhancing the respondent's feeling of accomplishment, so that a sense of making progress comes with each answer. This is desirable, giving the questionnaire the image of being easy to complete.

- **Provide directions for how to answer**

The need for clear directions on how to provide answers is often easy to overlook. Instructions such as "tick one box only", "tick all that apply", or "circle a number for each statement" need to be given for each question. It is especially important that directions are provided if respondents are required to circle or

tick more than one answer. Directions for answering need to be distinguished from the questions by placing them in parentheses and italics (for example, see Part 4, Question 1).

- **Filter questions**

Filter questions are those that direct some but not all respondents to skip one or more questions depending on the answer provided. There are two occasions when filter questions are used, first, when respondents provide an answer that indicates that the subsequent sequence of questions, which gather greater detail, is not applicable to them. For example, visitors who state this is their first time to the area do not need to answer questions relating to previous visits. The second situation is when a respondent may have a demographic characteristic that makes the series of questions irrelevant to them, for example, asking a series of questions on tertiary education of a respondent who has not studied at university. Filter instructions should be placed next to the answer category directing the respondent to the next relevant question depending on the answer provided (for example, see section 5.2, question 1).

- **Question spacing**

To encourage respondents to complete the questionnaire, questions need to appear spaced and not cluttered. Sufficient space for open-response questions needs to be provided; however, do not leave too much space as to discourage respondent's from completing the questionnaire because of the time it will apparently take. Questions should be printed on one side of the page only as it is too easy for respondents to miss questions printed on the backs of pages.

- **Use transitions for continuity**

Transitions are the connective material that provides a sense of flow, guidance, and continuity to the questionnaire. For example, a transitionary statement for introducing a question on satisfaction may be structured as follows:

"Next, we would like to ask about your satisfaction with this visit."

Transitional statements are used in three situations. One is when a new line of inquiry begins. Such transitional statements serve as a signal that some change in thought patterns is required. The second situation is the start of new pages. Here, they are aimed at the preliminary "page flippers", the people who want to see what the entire questionnaire is about before committing themselves to the task of answering. The third use of transitions is to break the monotony of a long series of questions on a single topic. They are added to give a conversational tone to what might otherwise sound like an inventory of questionnaire items.

3.2.1.7 Step 7: Evaluate the questionnaire

Once a rough draft of the questionnaire has been designed, a critical evaluation needs to be undertaken. At this point in the development of the questionnaire, the following items need to be considered: (1) Is the question necessary? (2) Is the survey too long? and (3) Will the questions provide the answers to address the objectives of the survey?

Is the question necessary? The most important criterion for this stage of questionnaire development is ascertaining the necessity of each given question. Researchers often ask questions because "it would be nice to know". For example, excessive demographic questions are very common. Education data, the number of children in each age category, and extensive demographics on the spouse are simply not warranted by the nature of many visitor studies.

Each question must serve a purpose. It must be a screener, an interest generator, a required transition, or be directly related to the stated objectives of the survey. Any question that fails to satisfy at least one of these criteria should be omitted.

Is the questionnaire too long? At this point, it is advisable to role-play the questionnaire with volunteers acting as respondents. Although there is no minimum number of interactions, the length of time it takes to complete the questionnaire needs to be noted. The length of the questionnaire should be suitable to the method of administration (see section 3.2.1.3).

Will the questions provide the desired information to accomplish the research objective? The researcher needs to make certain that a sufficient number and type of questions are contained within the questionnaire to meet the decision-making needs of management. A suggested procedure is to carefully review the survey objectives. The objectives of the survey should be realistic and manageable. Next, the researcher should read through the questionnaire and write each question number next to the objective that the particular question will assist to accomplish. If a question cannot be tied to an objective, the researcher needs to determine whether the list of objectives is complete. If the list is sufficient, the question should be omitted. Also, if after reading through the entire questionnaire there is an objective with no questions listed beside it, appropriate questions should be added to the questionnaire. The number of survey objectives will also influence the length of the questionnaire, thus, a trade-off needs to be made between the survey objectives and questionnaire length.

3.2.1.8 Step 8: Pre-test the questionnaire

The core and standard visitor survey questions have already been pre-tested for reliability and validity. However, pre-testing customised questions, if included, and the questionnaire itself for possible construction defects is an important part of questionnaire design. No survey should be administered with out a pre-test. Pre-testing is particularly important for self-administered modes because problems of comprehension and difficulties with answering questions are less evident. The best approach to pre-test a questionnaire is in person. This approach can follow one of two methods:

1. **Debriefing method.** In the debriefing approach the questionnaire is administered first. For example, the survey would be filled out without assistance from the interviewer; however, the interviewer should be instructed to observe and note reactions of confusion, resistance, or uneasiness. When the survey is complete, the interviewer should debrief the respondent by asking what he or she was thinking about when forming each answer, whether there were any problems of understanding, and whether any aspects of the subject were not covered by the questions.
2. **Protocol method.** In the protocol method the respondent is asked to "think aloud" when filling out the questionnaire. The interviewer records these thoughts, and at the end of the pre-test asks for further clarification of the problems where necessary.

Notwithstanding the method selected for pre-testing a questionnaire, the following issues need careful consideration during pre-testing:

- **Flow of the questionnaire**

Testing the "flow" of the questionnaire is often a matter of intuitive judgment. Since respondents do not know what the next question will be, questions must appear in a logical sequence and form part of a coherent flow. Transitions from one topic to another must also be pre-tested to ensure that they are clear and logical.

- **Filter questions and patterns**

Many questionnaires have instructions on what questions to skip depending on the answers to a previous question. Pre-testing provides the opportunity to check whether the instructions are clear.

- **Length**

Each section of the questionnaire should be timed to ensure that no section is too long. Unless the length of the questionnaire is pre-tested, the researcher may experience problems with respondent fatigue and initial refusal if respondents know in advance the expected length.

- **Respondent interest and attention**

Capturing and maintaining the interest of a respondent throughout the entire questionnaire is a major design challenge. Often the answering task is varied throughout the questionnaire to engage a respondent's active attention. The extent to which this is successful can and should be pre-tested.

- **Trial data analysis**

Analysis of data collected during the pre-test is recommended because it will show the type of output that will be generated by the study and its adequacy to answer the research objectives. Trial analyses show that all data collected will be used, and that all necessary data will be obtained.

3.2.2 Phase 2: Design A Sampling Strategy

The second phase of the visitor survey process details guidelines for designing a sampling strategy (see Figure 5). The goal of the sampling strategy is to obtain an accurate representation of visitors without sampling every visitor during the sampling period.

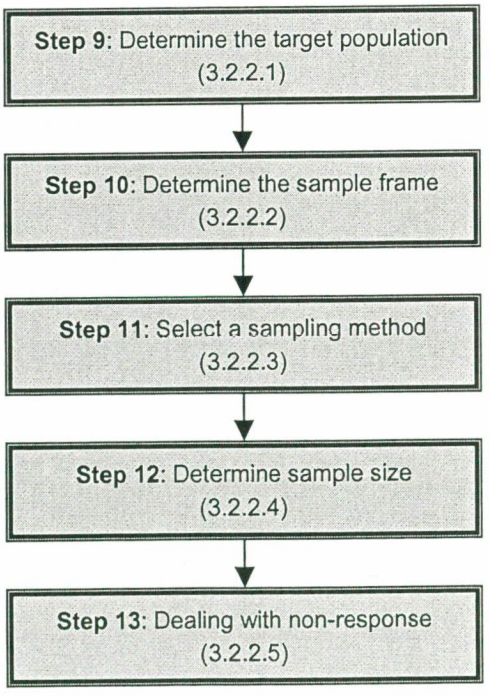


Figure 5 Phase 2 (Design a Sample Strategy) in survey research

3.2.2.1 Step 9: Determine the target population

Sampling design begins by specifying the target population, which is the collection of elements or objects that possess the information sought by the researcher and about which inferences are to be made. The target population must be precisely defined, in terms of elements, sampling units, and area of coverage.

> An **element** is the object about which or from whom the information is desired. In survey research, the element is usually the respondent.
>
> The target population consists of **sampling units** (e.g. people). The task is to specify which sampling unit is appropriate. The choice of sampling unit will depend on the purpose of the study.
>
> The **area of coverage** refers to the geographical boundaries relevant to the survey objectives. For example, if the objective is to survey visitors to a particular area (e.g. national park, local council park), the boundary is the geographical (or tenure) boundary that defines the area in question.

In addition to defining who should be included in the target population, it is also important to define the characteristics of those that should be excluded. For example, if the objective of the survey is to develop a profile of visitors to a particular area (e.g. a state forest), the population of interest will be restricted to those visitors who are visiting that particular area.

3.2.2.2 Step 10: Determine the sample frame

A sampling frame is a representation of the elements of the target population. The sampling frame may consist of either a list of population members used to obtain a sample, or a description of the procedure by which each sampling unit is located. Most sample frame procedures fall into one of three general categories:

1. Sampling is done from a more or less complete list of individuals in the population to be studied.
2. Sampling is done from a set of people who go somewhere or do something that enables them to be sampled (e.g. visitors to a specific site). In these cases, there is not an advance list from which sampling occurs; rather the creation of the list and the process of sampling occur simultaneously.
3. Sampling is done in two or more stages, with the first stage involving sampling something other than the individuals finally to be selected. In one or more steps, these primary units are sampled (e.g. households), and eventually a list of individuals is created, from which a final sample selection is made.

When a list of population members cannot be compiled, which is often the case when surveying visitors to a particular area, directions for identifying the target population must be specified. For example, if the target population is visitors to a particular area, the sample frame is based on the visitation patterns and attributes of the area including:

- the number and location of all entrances to the area including roads, walking tracks, and waterways;
- if possible, estimates of the amount of use each entrance receives and a description of the types of people who use the entrance (e.g. walkers, campers, locals); if this information is not

recorded, estimates of traffic flows and visitation patterns need to be obtained from experienced staff working in the area; and

- the number and location of key visitor sites including camping areas and day use areas.

Once the sample frame has been determined, the next step is to select a sampling procedure for selecting sampling units to be included in the survey.

3.2.2.3 Step 11: Select a sampling method

The selection of a sampling method will depend on the objectives of the survey, the resources available, and the nature of the research problem under investigation. A variety of sampling methods are available for respondent selection. The methods are usually divided into two broad types:

Probability samples must be selected in such a way that every element of the population has a known, non-zero probability of selection. Probability sampling implies the use of random selection and provides a statistical basis for saying that a sample is representative of the target population.

Nonprobability samples include the selection of specific elements of the population in a non-random manner. Such samples are chosen based on judgment regarding the characteristics of the target population and the needs of the survey. With nonprobability sampling, some members of the target population have a greater chance of being selected than others.

The advantages and disadvantages of probability and nonprobability sampling methods are presented in Table 14.

Table 14 Advantages and disadvantages of probability and nonprobability sampling methods

Advantages	*Disadvantages*
Probability Sampling Methods	
Information from a representative cross-section of the population of interest can be obtained	More expensive than nonprobability samples of the same size. The rules for selection increase interviewing costs and professional time must be spent in developing the sample design
Sampling error can be computed	Take more time to design and execute
Survey results are projectable to the total population	
Nonprobability Sampling Methods	
Samples cost less	Sampling error cannot be computed
Samples ordinarily can be conducted more quickly than probability samples	The researcher does not know the degree to which the sample is representative of the population from which it was drawn
Can produce samples of the population that are reasonably representative, if executed in a reasonable manner	The results cannot and should not be projected to the total population

An example of sampling guidelines for selecting a representative and random sample of visitors to an area are provided below:

- surveys should be distributed at locations that are used by a representative sample of the visiting population (e.g. vehicle entry points, visitor centers, car parks, campgrounds, and picnic areas);
- the locations should be surveyed at random intervals throughout the survey period; if there is more than one location to be surveyed, the amount of time spent at each location should reflect the level of visitor use; high use areas should be surveyed more often than low use areas;
- at each survey location the surveyor should identify a specific area and establish a survey position where visitor movement can be consistently and safely observed;
- only one visitor from each family group should be selected; although visitors may pass by while the surveyor is working with a respondent, interviewers should take their time, finish with a respondent and then begin to identify the next respondent; and
- if the person selected declines to participate in the survey, simply thank them and identify the very next visitor as the next potential respondent.

The same principles apply for the other sampling methods. For example, if stratified sampling procedures were selected to survey weekend and weekday visitors, the sampling guidelines would be the same as above, with separate samples selected during the week (e.g. Monday to Thursday) and weekend (e.g. Friday to Saturday) periods.

In addition to choosing between probability and nonprobability samples, the researcher must choose between different types of sampling procedures for each sampling method. A brief description of commonly used probability and nonprobability sampling methods and their benefits is presented in Table 15. Some of the issues that should be resolved when using each method are also discussed. A summary of the strengths and weaknesses associated with the various probability and nonprobability sampling methods is provided in Table 1.

A more detailed discussion of probability and nonprobability sampling methods is provided in section 2.3.1.4. Comprehensive discussions of probability and nonprobability sampling methods can be found in Babbie (1990), Fowler (1993), de Vaus (1995), McDaniel and Gates (1999), Aaker, Kumar and Day (2000), and Bouma (2000).

3.2.2.4 Step 12: Determine sample size

Once a sampling method has been selected, the next step is to determine the appropriate sample size. Of the many issues involved in sample design, one of the most common questions posed is how big a survey sample should be. There is a popular misconception that the adequacy of a sample depends on a fraction of the population included in that sample – that somehow 1 per cent or 5 per cent, or some other percentage will make a sample credible. This is not necessarily so. What is important is the absolute size of the sample, regardless of the size of the population. For example, many well-known national surveys and opinion polls are based on samples of less than 2000. These polls have demonstrated that the behaviour of millions of people can be predicted quite accurately using samples that are minuscule in relation to the size of the population.

Table 15 Commonly used probability and nonprobability sampling methods

Description	*Benefits*	*Issues*
Probability Sampling		
Simple random sampling		
Every unit has an equal chance of selection from the sample frame	Relatively simple to do	Members of a subgroup of interest may not be included in appropriate proportions
Stratified random sampling		
The study population is grouped according to meaningful characteristics or strata	Can conduct analyses of subgroups (e.g. female and male, weekday and weekend use) Sampling variations are lower than that for random sampling; the sample is more likely to reflect the population	Must calculate sample sizes for each subgroup Can be time consuming and costly to implement if many subgroups are necessary
Systematic sampling		
Every *k*th unit on a list of eligible units is selected *k*th can mean 5th, 6th, 23rd and so on, determined by dividing the population by the desired sample size	Convenient; use existing list (e.g. names) as a sampling frame Similar to random sampling if starting point is randomly divided	Must watch for recurring patterns within the sampling frame (e.g. names beginning with a certain letter; data arranged by month)
Cluster/Multistage sampling		
Natural groups or clusters are sampled, with members of each selected group sub-sampled afterward	Convenient; use existing units (e.g. national parks, state forests)	
Nonprobability sampling		
Convenience sampling		
Use of a group of individuals or units that is readily available	A practical method because you rely on readily available units	Because sample is opportunistic and voluntary, participants may be unlike most of the constituents in the target population
Snowball sampling		
Previously identified members identify other members of the population	Useful when a list of names for sampling is difficult or impractical to obtain	Recommendations may produce a biased sample Little or no control over who is named
Quota sampling		
The population is divided into subgroups A sample is selected based on the proportions of subgroups needed	Practical if reliable data exist to describe proportions	Records must be up to date to get accurate proportions
Focus groups		
Groups of people (8-10) serve as representatives of the population	Useful in guiding survey development	Must be certain the relatively small group is a valid reflection of the larger group that will be surveyed

Source: Fink (1995: 22-23).

Determining sample size is complex and involves several qualitative and quantitative considerations. The following are general guidelines, and it is recommended that professional statistical guidance be sought to assist with determining an appropriate sample size.

Qualitative factors that should be considered in determining sample size include:

- **The importance of the decision**. In general, for more important decisions, more information is necessary and the information should be obtained more precisely. This calls for larger samples, but as the sample size increases, each unit of information is obtained at greater cost.

- **The nature of the research**. For exploratory research, such as those using qualitative methods (e.g. focus groups), the sample size is typically small (i.e. less than 100 samples). For conclusive research, such as descriptive surveys, larger samples are required.
- **The number of variables**. If data are being collected on a large number of variables, larger samples are required. The cumulative effects of sampling error across variables are reduced in a large sample.
- **The nature of the analysis**. If sophisticated analysis of the data is required, the sample size should be large. Thus, a larger sample would be required if the data are being analysed at the subgroup level (e.g. age groups) than if the analysis is limited to the aggregate or total sample. As a general rule, ensure that the smallest subgroup has at least 50 samples.
- **Sample sizes used in similar studies**. Surveys of visitors to natural areas typically range from 100 to 500 samples. Studies have shown that survey errors associated with sample sizes of less than 100 are too high, and thus lack generalisability. At the same time, however, studies have also shown that beyond a certain point the cost of increasing the sample size is not worth it in terms of the extra precision gained.
- **Resource constraints**. More often than not, a strict resource constraint in terms of the budget and time available to do visitor surveys exists. Trade-offs between the amount of time and budget available, and the level of precision, accuracy, and analysis that is required, will need to be made.

Sample size may also be determined by applying **quantitative factors,** otherwise known as the confidence interval approach.

The Confidence Interval Approach

The confidence interval approach applies the concepts of variability, confidence interval, sampling distribution, and standard error of a proportion (or mean) to create a valid sample.

> **Variability** is defined as the amount of dissimilarity (or similarity) in respondents' answers to a particular question.
>
> A **confidence interval** is a range into which the true population parameter will fall, assuming a given level of confidence.
>
> The **sampling distribution** is the distribution of the values of a sample statistic computed for each possible sample that could be drawn from the target population under a specified sampling plan.
>
> The **standard error** is an indication of how far away from the true population value a typical sample result is expected to fall.

To calculate the sample size for a survey, the amount of variability believed to be in the population, the desired level of accuracy, and the level of confidence required for the estimates of the population values needs to be considered. The relationship between these factors is best explained by the following example.

The confidence intervals for various statistics for various sample sizes are shown in Table 16. Down the left side of the table are various sample sizes, ranging from 50 to 10,000. Across the top of the table are statistical proportions that may be found in surveys. Given knowledge (or an estimate) of the proportion of a sample that gives a particular answer, the table provides 95 per cent confidence intervals for various sample sizes. An example of how the table is interpreted is as follows: suppose we have a sample size of 250 and we have a finding that 90 per cent of the sample have a certain characteristic, say, they have travelled independently to the area, and the remaining 10 per cent have travelled as part of an organised tour. Reading from the table, for a sample size of 250, we find that a finding of 90 per cent (and 10 per cent) is subject to a confidence interval of plus or minus (±) 3.7. In other words, we can be fairly certain that the true population value lies in the range of 86.3 per cent and 93.7 per cent.

Table 16 Confidence intervals for variability attributable to sampling (at the 95% confidence level)

	Proportion of sample with characteristics					
Sample size	**50/50**	**40/60**	**30/70**	**20/80**	**10/90**	**5/95**
50	13.9	13.6	12.7	11.1	8.3	6.0
80	11.0	10.7	10.0	8.8	6.6	5.3
100	9.8	9.6	9.0	7.8	5.9	4.3
150	8.0	7.8	7.3	6.4	4.8	3.5
200	6.9	6.8	6.3	5.5	4.2	3.0
250	6.2	6.1	5.7	5.0	3.7	2.7
300	5.7	5.5	5.2	4.5	3.4	2.5
400	4.9	4.8	4.5	3.9	2.9	2.1
500	4.4	4.3	4.0	3.5	2.6	1.9
750	3.6	3.5	3.3	2.9	2.1	1.6
1000	3.1	3.0	2.8	2.5	1.9	1.3
2000	2.2	2.1	2.0	1.7	1.3	1.0
4000	1.5	1.5	1.4	1.2	0.9	0.7
10000	1.0	1.0	0.9	0.8	0.6	0.4

Source: Fowler (1993: 31), Veal (1997: 211).

Several points about Table 16 are important. First, it can be seen that increasingly large samples always reduce sampling errors. Second, adding a given number of cases or respondents to a sample reduces sampling error a great deal more when the sample is small than when it is comparatively large. For example, adding 50 cases to a sample of 50 produces a quite noticeable reduction in sampling error. Adding 100 cases to a sample of 400, however, produces a less noticeable reduction in sampling error. Third, the absolute size of the sampling error is greatest around proportions of 50 per cent and decreases when the proportion of a sample having a characteristic approaches either zero or 100 per cent. Fourth, Table 16 and the equations on which it is based apply to samples drawn with simple random sampling procedures.

3.2.2.5 Step 13: Dealing with non-response

The object of sampling is to obtain a body of data that is representative of the population. The quality of the sample data depends on the proportion of that set from which data are actually collected. There are three categories of those selected to be in a sample who do not provide data:

- those whom the data collection procedures do not reach, thereby not giving them a chance to answer questions,
- those asked to provide data who refuse to do so, and
- those asked to provide data that are unable to perform the task required of them (e.g. people who are too ill to be surveyed, who do not speak the researcher's language, or whose reading and writing skills preclude their filling out self-administered questionnaires).

Bias Associated with Non-response

The effect of non-response on survey estimates depends on the percentage not responding and the extent to which those not responding are biased or systematically different from the population. The response rate is a basic parameter for evaluating a data collection effort. Response rates are usually reported as the percentage of a selected sample from which data were collected.

The effect of non-response depends on whether those who respond to the survey differ from non-respondents in a meaningful way, thereby creating biases. The seriousness of non-response bias depends on the extent of the non-response. If the percentage involved is small, then the bias is small. The very act of being a non-respondent often implies a meaningful difference. Bias attributed to non-response can be detected by comparing the demographic characteristics (e.g. age, gender, education) of:

- those who respond immediately with those who respond after follow-up steps are taken, and
- respondents and non-respondents.

Reducing Non-response

Non-response may be minimised by implementing the following:

- during the survey build rapport with the respondent, and motivate and encourage them to complete and return the questionnaire;
- to enlist the cooperation of the respondent, present the purpose of the study effectively and accurately;
- the questionnaire should appear professional, personalised, attractive, and easy to complete;
- minimise the length of the questionnaire as a long questionnaire may discourage potential respondents;
- the questions should be attractively spaced, easy to read and uncluttered;
- follow up and remind non-respondents (e.g. send a replacement mail questionnaire); and
- reminders should be avoided during December and holiday periods because of delivery delays and absence due to school holidays.

Correcting for Non-response

Some non-response is inevitable. As a general principle, the best approach for minimising non-response is to encourage the cooperation of potential respondents to maximise response rates. If non-response error is high, three approaches may be used to reduce the error associated with non-response: using proxy respondents, statistical adjustments, and resurveying a sample of non-respondents.

1. Proxy respondents

When a respondent is unable or unwilling to participate in a survey, asking another member of the group to report for the designated respondent is one option for reducing non-response. Providing there is a knowledgeable proxy available, proxy reporting is most suitable when asking respondents about factual information. Proxy respondents are not suitable for obtaining information relating to the subjective states (e.g. feelings and opinions) of designated respondents.

2. Statistical adjustments

Statistical correction for non-response works as follows: Suppose people aged between 18 and 24 years of age are known to constitute 20 per cent of visitors to a particular area. Because of differential non-response, though, only 10 per cent of the sample respondents are aged 18 to 24 years. After the survey is complete, the researcher could weight the answers of those aged 18 to 24 who responded so that they are the equivalent of 20 per cent of the responses. To the extent that those aged 18 to 24 gave different survey answers than those who were older, the resulting estimates might be better. This result, however, also depends on the 18 to 24 year-old respondents being representative of the 18 to 24 year-old non-respondents, which may not be true.

3. Surveying non-respondents

Suppose that a mail survey was conducted, and 60 per cent of those sampled participated. The researcher thinks that many non-respondents would respond to a request to give a personal or telephone interview, but lack the funds to try those procedures for all respondents. An option is to draw a sample of non-respondents to be contacted using the more expensive methods. Data collected in this manner may serve two purposes:

- Information from the second round of data collection can be used to estimate the direction and amount of bias in the initial sample. The second round will most likely also have non-response, and may still produce data that do not fully represent all respondents; however, the data may be used to improve the statistical adjustments discussed above.

- If the new round of data collection replicates questions in the initial survey, the results can be added to the initial sample data set. To do this, the data need to be weighted to adjust for the fact that only a sample of non-respondents received the follow-up treatment. For example, if half the non-respondents are followed-up, then the respondents from this phase of data collection should be weighted by a factor of two when they are combined with the initial data.

3.2.3 Phase 3: Administration of Questionnaires

The third phase of the survey process provides guidelines on questionnaire administration (Figure 6). This section provides guidelines for administering visitor surveys. The guidelines for personal surveys and personal intercept and mail-back surveys are similar; however, where differences occur, mention will be made. The differences are largely attributed to the fact that personal surveys are interviewer-administered, while the personal intercept and mail-back survey method is largely self-administered.

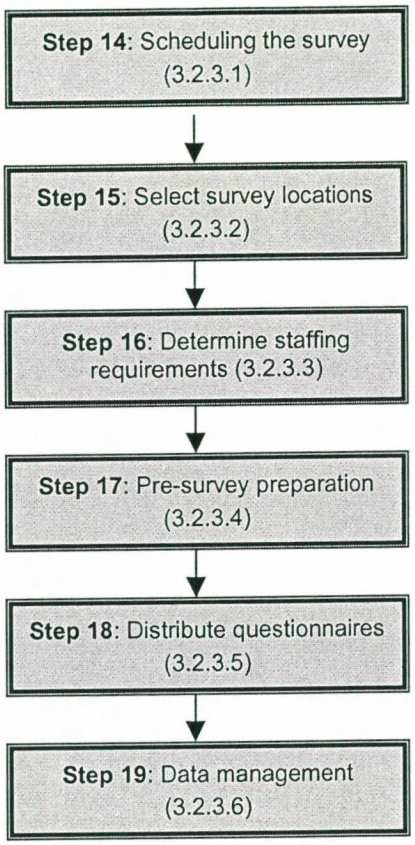


Figure 6 Phase 3 (Questionnaire Administration) in survey research

3.2.3.1 Step 14: Scheduling the survey

To schedule a visitor survey, the following factors need to be taken into consideration:

- Identify the time of year when visitation is most representative. If visitation to the area is significantly effected by seasonality (e.g. winter versus summer), select one season for this survey, and the other season for when another visitor survey is to be scheduled.
- A minimum of four days and a maximum of seven days need to be selected as the survey period. The survey period should incorporate both week days and weekend days. Visitor experiences can be significantly different between week days and weekends.
- The amount of time spent undertaking visitor surveys should be consistent during the survey period. For example, during the pilot studies that led to the development of this Manual, the survey period for each day began at 8 o'clock in the morning and finished at 5 o'clock in the afternoon.

3.2.3.2 Step 15: Select survey locations

Visitor surveys should be distributed at locations that are used by a representative sample of the area's visitor population (see section 3.2.2.2). Suggested survey locations include:

- vehicle entrance points,
- visitor centers,
- car parks,
- campgrounds,
- day use areas (e.g. picnic areas), and
- trackheads.

Survey locations need to be assigned for each of the survey days. If there is more than one survey location, vary the assignments to reflect the level of visitor use; high-use areas should be surveyed more often than low-use areas (see section 3.2.2.2).

3.2.3.3 Step 16: Determine staffing requirements for administering surveys

The number of interviewers required for administering visitor surveys will depend on:

- the number of sites to be sampled,
- the level of use, and
- the location of survey sites.

The majority of survey sites will require one person; however, if a site is heavily used or remote, two people may be needed. The safety of staff should be a priority at all times.

Interviewer training is critical to the quality of data collected. Training ensures that all interviewers administer the questionnaire in the same manner so the data can be collected uniformly. Training should cover making the initial contact, asking the questions, probing, recording the answer, and terminating the interview. These points are particularly important for interviewer-administered surveys.

- **Making the initial contact**

The initial contact can result in cooperation or the loss of potential respondents. Interviewers should be trained to make opening remarks that will convince potential respondents that their participation is important.

- **Asking the questions**

A slight change in wording, sequence or manner in which a question is asked can distort its meaning and bias the response. Training in asking questions can yield high dividends in eliminating potential sources of bias. Changing the phrasing or order of questions can make significant differences in the response obtained. The following are guidelines for asking questions:

- follow instructions carefully,
- be thoroughly familiar with the questionnaire,
- ask the questions in the order in which they appear in the questionnaire,

- use the exact wording given in the questionnaire,
- read each question slowly,
- repeat questions that are not understood, and
- ask every applicable question.

- **Probing**

Probing is intended to motivate respondents to clarify or explain their answers. Probing also helps respondents to focus on the specific content of the interview and provide only relevant information. Listed below are some commonly used probing techniques.

- Repeating the question in the same words can be effective in eliciting a response.
- Repeating the respondent's reply verbatim can stimulate respondents to provide further comments.
- Using an expectant pause or silent probe can cue the respondent to provide a more complete response. However, the silence should not become embarrassing.
- Reassure the respondent if the respondent hesitates with comments like: "There are no right or wrong answers. We are just trying to get your opinions." If the respondent needs an explanation of a word or phrase, the interviewer should not offer an interpretation. Rather, the responsibility for the interpretation should be returned to the respondent. This can be achieved with a comment such as: "Just whatever it means to you."
- Elicit clarification to arouse the respondent's motivation to cooperate with the interviewer and provide complete answers with a question like: "I don't quite understand what you mean by that, could you please tell me a little more?"

- **Recording the answers**

Although recording respondent answers seems simple, several mistakes are common. All interviewers should use the same format and conventions to record the interviews and edit completed interviews. While the rules for recording answers to closed-response questions vary with each questionnaire, the general rule is to mark the box that reflects the respondent's answer. The general rule for recording answers to open-response questions is to record the response verbatim. The following are specific guidelines for recording answers to open-response questions:

- record the responses during the interview,
- use the respondent's own words,
- do not summarise or paraphrase the respondent's answers,
- include everything that pertains to the question objectives,
- include all probes and comments, and
- repeat the response as it is written down.

- **Terminating the interview**

The interview should not be closed before all the information is obtained. The interviewer should answer the respondent's questions about the study. The respondent should be left with a positive feeling about the interview. It is important to thank the respondent and express appreciation.

In addition to conducting an interview, interviewers should also be briefed on the following points:

- establishing survey locations,
- distributing surveys to visitors,
- the interviewer's message,
- suggested techniques for increasing visitor response,
- instructions if visitor is willing to participate in survey, and
- instructions if visitor declines to participate in survey.

Interviewers may be recruited from the agency undertaking the survey, or may be volunteers, or university graduate and postgraduate students.

3.2.3.4 Step 17: Pre-survey preparation

Prepare Questionnaires

Once the questionnaires have been printed to specification, the following steps need to be taken before distributing to visitors.

Interview-administered questionnaires (personal survey method):

- Each questionnaire needs to be numbered (1-n) on the top right corner of the first page. The number of each questionnaire should correspond to the same number on the Interview-administered Interview Form (Appendix III) on which the details of each respondent is recorded.

Self-administered questionnaires (personal intercept mail-back method):

- Each questionnaire needs to be numbered (1-n) on the top right corner of the first page. The number of each questionnaire should correspond to the same number on the Self-administered Interview Form (Appendix IV) on which the details of each respondent is recorded. As surveys are mailed back for processing, each survey number can be marked off on the interview form. Two weeks after the survey period, follow-ups are then sent to those respondents who have not been marked off on the form.
- Reply-paid artwork proofs for reply-paid envelopes needs to be arranged through Australia Post (www.auspost.com.au). The artwork contains a unique barcode representing the reply-paid address. The postage of reply-paid envelopes (110mm X 220mm) costs $0.46 per envelope.

Assemble Survey Materials

Before commencing the distribution of questionnaires, assemble the following materials for each interviewer:

- name badge
- clipboard
- pens
- interview form
- a batch of questionnaires
- sampling plan
- copy of instructions for distribution
- copy of introductory message for interviewers.

Familiarise yourself with the area

Arrive at the area a day before commencing the visitor survey to review logistics, and become familiar with traffic patterns and visitor flow. Use this time to train your interview team and familiarise them with the sites where they will be surveying visitors. If time permits, run practice surveys so that the interviewers become familiar with the interview routine and, in particular, the introductory message. Their interview with the visitor should contain all the points mentioned in the introductory message (see section 3.2.3.5). Interviewers should also practice filling out the relevant interview forms (Appendices III and IV).

Last-minute preparation

At the commencement of each survey day, arrive ahead of the scheduled starting time to check that all of the survey materials are prepared. Reinforce the importance of following the sampling plan to interviewers. Lunch breaks should be scheduled at different times over the survey period to reduce any possibility of sample bias.

3.2.3.5 Step 18: Distribute questionnaires

Distribution Do's and Don'ts

Interviewers should use the following guidelines when distributing questionnaires to visitors:

- Only one person per family unit can participate in the survey. If a group is approached that is composed of more than one family unit, distribute a questionnaire to one member of each family unit. For example, if a group of visitors are approached comprised of a family of four and two grandparents, two separate surveys should be distributed, one to the family of four, and one to the grandparents.
- Although visitors may wish to volunteer, they should not be selected as potential respondents.
- If surveys are to be self-administered, every questionnaire must be handed directly to a respondent. Visitor surveys cannot be left on a visitor centre desk for distribution.
- Each potential respondent should be addressed in a friendly, cheerful, and courteous manner.

- If the potential respondent does not read or understand English, the interviewer should identify a person in the group who does. If there is not a suitable replacement, treat the situation as if the visitor declined to participate and note as a refusal on the interview form. Thank them for their time and go to the next potential respondent.
- Respondents should not receive more than one questionnaire.

Interviewers Introductory Message

When approaching a potential respondent, the interviewer should begin the survey with the following message:

Interview-administered surveys (personal survey method)

Hello my name is [INSERT NAME OF INTERVIEWER]. I am doing some visitor surveys for the [INSERT NAME OF AGENCY]. The agency is interested in your visit and what you think of the services and facilities provided in the [INSERT TYPE OF AREA]. The information collected will be used to improve the management of, and services provided at, [INSERT NAME OF AREA]. The survey will take about ten minutes, and the information collected is treated as confidential. Could you spare 10 to 15 minutes of your time to answer some questions about your visit to this [INSERT TYPE OF AREA]?

Self-administered surveys (personal intercept and mail-back method)

Hello my name is [INSERT NAME OF INTERVIEWER]. I am doing some visitor surveys for the [INSERT NAME OF AGENCY]. The agency is interested in your visit and what you think of the services and facilities provided in the [INSERT TYPE OF AREA]. The information collected will be used to improve the management of, and services provided at, [INSERT NAME OF AREA]. It is a self-administered survey, and a self-addressed, reply-paid envelope is attached for your convenience. The survey will take about ten minutes of your time and the information collected is treated as confidential. Would you be interested in taking a survey with you to fill in at the end of your visit?

During the introductory message, it is important that the conversation with potential respondents is conducted in a positive manner. Interviewers should emphasise the importance of visitor feedback. Each respondent should be convinced that their feedback will be used to improve the management of, and services provided at, the area in question.

Suggested techniques for increasing visitor response include:

- allow a sufficient amount of time for interacting with each potential respondent,
- plan your interaction with each potential respondent,
- establish direct eye contact,
- speak in an enthusiastic manner, and
- explain to the visitor the value of their opinions to the agency managing the area in question.

Visitors who are willing to participate in the survey

If the potential respondent agrees to participate in the visitor survey:

Interview-administered surveys (personal survey method)

- record their details on the Interview-administered Interview Form (Appendix III),
- conduct the interview at a place that is comfortable and convenient for the visitor, and
- thank the visitor for participating when the interview is finished.

Self-administered surveys (personal intercept and mail-back survey method)

- record their details on the Self-administered Interview Form (Appendix IV),
- remind them that if their survey has not been received within two weeks of the survey period, a reminder letter with a replacement questionnaire will be mailed to them to ask for their cooperation,
- reinforce that their opinions are important,
- thank them for participating, and
- encourage them to complete the survey at the end of their visit and return by mail in the self-addressed reply-paid envelope provided.

Visitors who decline to participate in the survey

If the potential respondent declines to participate in the survey:

- thank them for their time,
- mark them down as a refusal on the interview form, and
- select the next visitor as a potential respondent.

3.2.3.6 Step 19: Data management

This section details the procedures for managing survey data that is obtained using the personal intercept mail-back method of administering visitor surveys. Following the survey period, the following tasks for recording the mail-back surveys need to be undertaken:

- For two weeks following the end of the survey period, after each day's mail arrives each questionnaire should be marked off in the "Mailed-back" column on the Self-administered Interview Form (Appendix IV), by placing a tick in the row number that corresponds with the questionnaire number (recorded in the top right hand corner of the questionnaire). Each questionnaire should also be stamped with the date it was posted which should be recorded on the reply-paid envelope. Questionnaires should then be placed in sequential order by number.

- Using the Questionnaire Response Rate Form (see Appendix V), write the date and number of questionnaires received each day. Add the number of questionnaires already received to the number received each day. Calculate the response rate by dividing the cumulative tally by the number of questionnaires distributed.

- When two weeks have lapsed, follow-ups need to be sent to non-respondents (i.e. those respondents who have not mailed back their surveys). The follow-up mailings should include a reminder letter (see Appendix VI for a standard template) that is printed on letterhead and signed, and a replacement questionnaire, with a self-addressed, reply-paid envelope. To identify questionnaires that have been returned as a result of reminders, place the letter "R" next to the questionnaire number in the top right hand corner of the questionnaire. For example, if the 44th respondent who agreed to participate has not sent their survey back by mail within the first two-week period, the number "44R" should appear on the replacement questionnaire so it can be identified as a replacement questionnaire.

- The beginning of the follow-up period should be marked on the Questionnaire Response Rate Form. Once the follow-ups have been sent out to respondents, questionnaires that are received in the next two weeks should also be recorded on the Questionnaire Response Rate Form. In total, respondents are given a four-week period to mail back their completed questionnaires. Surveys received after the four-week deadline should be discarded.

- Once follow-up mailings have been sent, the names and postal addresses of respondents should be disposed of and preferably shredded to protect respondent privacy and confidentiality.

- Follow-up mailings are an effective method for increasing response rates. For example, a recent survey of visitors to the Bunya Mountains National Park using the personal intercept and mail-back approach yielded a 79 per cent response rate (Horneman 2002). The rate of returns over the four-week period is presented in Figure 7. The majority of visitors returned the surveys by mail in the first week following the survey period. Follow-up mailings to non-respondents on 14 October increased the response rate by 18 per cent.

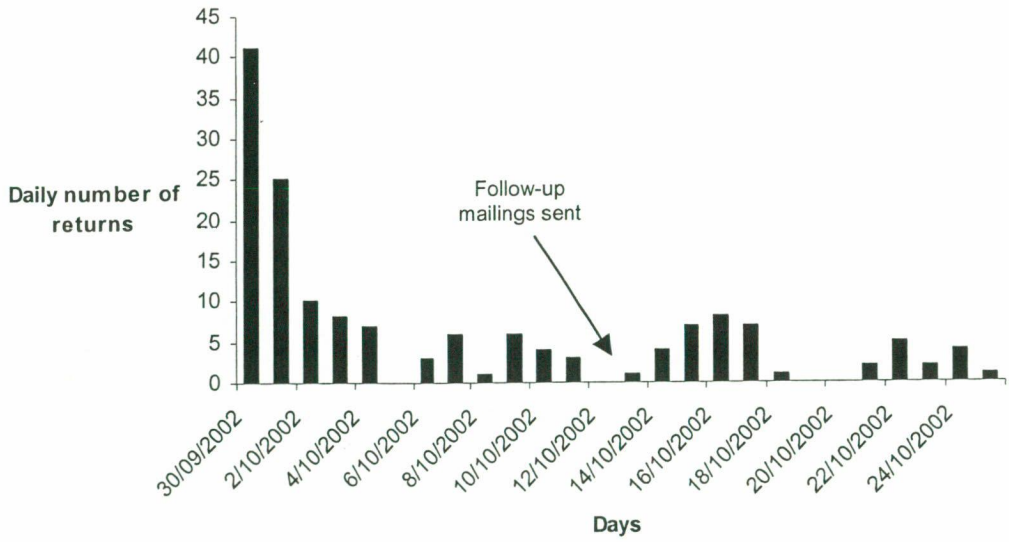


Figure 7 Bunya Mountains National Park visitor study response rate

Studies of visitors to a diversity of natural areas, applying the personal intercept and mail-back survey method, have produced similar response rates (Table 17).

Table 17 Comparison of response rates

	Sample size (N)	*Response rate (%)*
Oxley Wild Rivers National Park (Wollomombi Gorge section)	54	77
Crowdy Bay National Park	44	81.5
Carnarvon National Park (Carnarvon Gorge section)	174	71
Kondalilla National Park	164	66
Kenilworth State Forest	155	76

Source: Horneman (2001a, 2001b, 2001c, 2001d, 2001e)

3.2.4 Phase 4: Data Analysis and Reporting

This section details guidelines for analysing and reporting survey data (see Figure 8). The section begins with a discussion on data preparation and emphasises the importance of editing and coding survey data. The section then presents guidelines for entering, analysing and reporting visitor survey data.

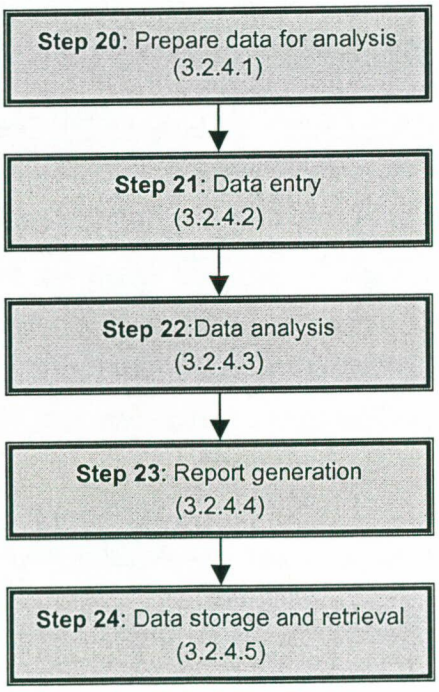


Figure 8 Phase 4 (Data Analysis and Reporting) in survey research

3.2.4.1 Step 20: Prepare data for analysis

The data preparation process involves data editing and data coding. These tasks are discussed in detail below.

Data Editing

The purpose of this task is to make sure that all questionnaires have been filled out properly and completely, with the objective of increasing accuracy and precision. This task involves screening questionnaires to identify illegible, incomplete, inconsistent or ambiguous responses. The editing process involves manual checking for a number of problems including the following:

1. whether the interviewer/respondent has failed to ask/answer any questions or record answers for certain questions,
2. that skip patterns or filter questions have been correctly followed, and
3. responses to open-response questions are eligible.

Editing is an extremely tedious and time-consuming task, however, it is an important step in the data preparation stage.

Coding Data

Coding refers to the process of grouping and assigning numeric codes to the various responses to a particular question. Most closed-response survey questions are pre-coded. This means that numeric codes have been assigned to the various responses on the questionnaire itself before it is administered. For example, all of the closed-response questions contained in the survey in Appendix II have been pre-coded. Note that each closed-response has a numeric code to the right of each answer box.

Unlike closed-response questions that are pre-coded, open-response questions are coded when the surveys are returned. As with editing, the process of coding responses to open-response questions is tedious and time-consuming; however, the richness and detail of information obtained often outweighs the initial time involved. Coding open-response questions is a subjective task. For this reason, it is recommended that two people independently code the responses, and then compare the results.

There are four steps in the process of coding responses to open-response questions:

1. ***List responses***. Develop a list of the responses for each open-response question. The listing may be done as part of the editing process or as a separate step.
2. ***Consolidate responses***. Identify responses that are similar, and consolidate them into a single response category. Because of the subjective nature of this stage in the coding process, it is important that the two independent coders discuss how and why they consolidated the open-responses.
3. ***Setting codes***. Assign numeric codes to each category in the final list of consolidated responses.
4. ***Enter codes on questionnaire***. The actual entry of codes involves several sub-steps:
   - read responses to individual open-response questions on each questionnaire;
   - match individual responses with consolidated list of response categories; and
   - assign the numeric code for the matched category, and write the code next to the appropriate place on the questionnaire for the response to the particular question.

3.2.4.2 Step 21: Data entry

Data entry refers to the process of converting information from a form that cannot be read by a computer to a form that can be read by a computer. This process requires a data entry device and a storage medium. A Visitor Data System, adopted by the New South Wales National Parks and Wildlife Service and Parks Australia and originally developed by the South Australian Parks and Wildlife Service, has been recommended for adoption as a state-wide database across New South Wales and Queensland, for analysing and reporting visitor survey data. For more information, refer to the Visitor Data System Training Manual (New South Wales National Parks and Wildlife Service and Environment Australia 2002). Alternatively, data can be entered into standard data analysis software packages such as Microsoft Excel for simple reporting purposes.

Data entry involves transferring the coded data from the questionnaires directly into an electronic medium by a competent keyboard operator. Besides key-punching, the data can be transferred by using mark sense forms, optical scanning or computerised sensory analysis. Mark sense forms require responses to be recorded with a special pencil in a predesignated area coded for that response. The data can then be read by a machine. Optical scanning involves direct machine reading of the codes and simultaneous transcription. A familiar example of optical scanning is the transcription of universal product code data at supermarket checkout counters. Technological advances have resulted in computerised sensory analysis systems, which automate the data collection process. The questions appear on a computerised gridpad and responses are recorded directly into the computer using a sensing device.

If key-punching is used to enter data, errors can occur and it is necessary to verify the data set for key-punching errors. Data verification involves checking the data entered against the raw data to identify any errors that may have occurred during the data entry process. If electronic scanning devices are used to enter the data, data verification involves a cross check of the scanned data against the raw data. As a general principle, all survey data should be verified; however, given the cost and time constraints, it is sufficient to only verify 25-50 per cent of the data.

Data Cleaning

Data cleaning includes consistency checks and treatment of missing responses. While preliminary consistency checks have been made during editing, the checks at this stage are more thorough and extensive, since they are most often made by computer. Consistency checks identify data that are out of range, logically inconsistent or have extreme values.

Out-of-range data values are inadmissible and must be corrected. For example, respondents have been asked to indicate their level of agreement with a series of statements on a 1- to 5-point scale. Assuming that the number 9 has been designated for missing values, data values of 0, 6, 7, and 8 are out-of-range. Statistical software packages like SPSS (Statistical Package for the Social Sciences) and SAS (Statistical Analysis System) can be programed to identify out-of-range values for each variable. The correct response can be cross checked by going back to the edited and coded questionnaire.

Responses can be logically inconsistent in various ways. For example, a respondent reports both unfamiliarity with, and frequent use of, the same product. The necessary information such as respondent identification number, variable code, and variable name can be printed to locate and correct inconsistent responses.

Extreme values should be closely examined. Not all extreme values result from errors, but they may point to problems with the data. For example, an extremely low evaluation of interpretation may be the result of the respondent indiscriminately circling 1s (on a 1 to 7 rating scale) for all attributes.

Missing responses represent values of a variable that are unknown, either because respondents provided ambiguous answers or their answers were not properly recorded. The treatment of missing responses poses problems, particularly if the proportion of missing responses is more than 10 per cent. The following options are available for the treatment of missing responses:

1. *Substitute a neutral value.* A neutral value, typically the mean response to the variable, is substituted for the missing responses. While this approach has some merit, the logic of substituting a mean value (say 4) for respondents who, if they had answered, might have used either high ratings (6 or 7) or low ratings (1 or 2) is questionable.

2. *Substitute an imputed response.* The respondents' pattern of responses to other questions is used to impute or calculate a suitable response to the missing responses. The researcher attempts to infer from the available data the responses the individuals would have given if they had answered the questions. This can be done statistically by determining the relationship of the variable in question to other variables. This approach, however, requires considerable effort and can introduce serious bias. As a general principle, if the missing response can not be easily and confidently inferred, the value should be clearly identified as a missing value in the analysis (for example, substitute the number 9 for missing values).

3.2.4.3 Step 22: Data analysis

The process of selecting a data analysis strategy is dependent on four factors:

1. the number of variables being examined,
2. the level of measurement of the variables,
3. the methods of analysis, and
4. the choice between descriptive or inferential statistics.

The number of variables

The selection of a data analysis strategy is initially dependent on the number of variables to be analysed (see Figure 9). Data analysis should aim to address the survey objectives and research questions (see section 3.2.1.5). To address a first order research question (e.g. gender composition of visitors), a univariate method of analysis is most appropriate. To address a second order research question (or two variables simultaneously), such as the relationship between gender and frequency of visit, bivariate methods of data analysis are most appropriate. To address a third order research question and higher (or three or more variables simultaneously), such as the relationship between gender, frequency of visit, and participation in an activity, multivariate methods of analysis are the most appropriate.

Once an analytical technique has been selected (e.g. univariate, bivariate or multivariate), the next step is to choose between a range of such techniques.

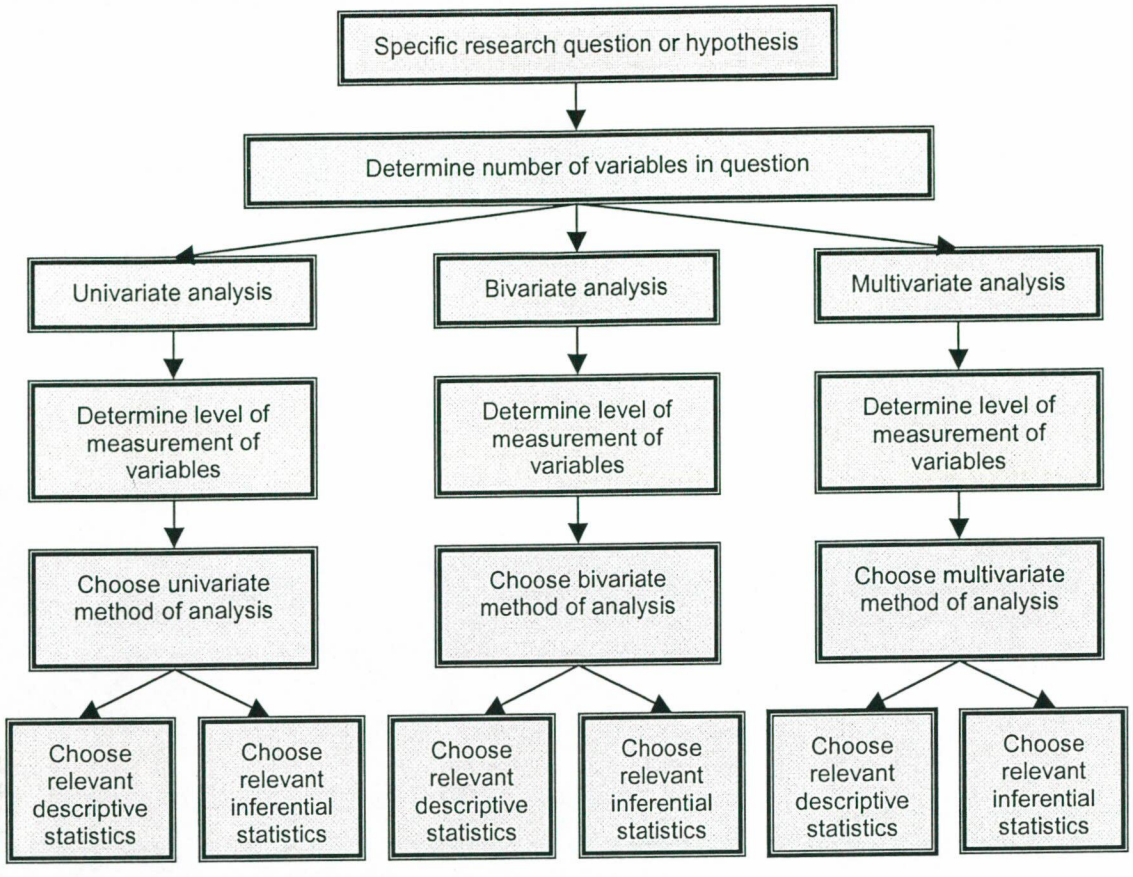


Figure 9 Flow chart for selecting analysis and statistical technique (de Vaus 1995: 133)

Levels of measurement

Having decided to use univariate, bivariate or multivariate techniques, the next step is to decide which particular technique to use within these broad categories. A key factor in this choice is the level of measurement of the variables being used. The levels of measurement refer to how the categories of the variable relate to one another. There are four main levels of measurement: nominal, ordinal, interval and ratio (see section 3.2.1.5, pp. 36-37).

The level of measurement has a direct effect on the level of analysis that can be administered to the data. The following points should be considered when deciding on which level of measurement to aim for:

- A wider range of methods of analysis is appropriate as the level of measurement of variables increases.
- More powerful and sophisticated techniques of analysis are appropriate for interval level variables.
- Higher levels of measurement provide more information.
- Questions which require a lot of precision and detail can be unreliable since people do not often have accurate, detailed information.
- Respondents may be reluctant to provide precise information but may provide it in more general terms (e.g. income bracket).

- If variables are measured at an interval level it is simple to reduce to an ordinal or nominal level. Data collected at lower levels cannot be converted to higher levels.

Methods of analysis

The method of analysis adopted depends on the complexity of the research question. If it involves only one variable (a first order question), select a method of analysis appropriate for univariate analysis. If the question involves two variables (a second order question), select a method of analysis appropriate for bivariate analysis and so on. Within each level of analysis there are a range of methods of analysis (Table 18).

Table 18 Analytical methods available for survey data analysis

Univariate methods	*Bivariate methods*	*Multivariate methods*
Frequency distributions	Crosstabulations	Conditional tables
	Scattergrams	Partial rank order correlation
	Regression	Multiple and partial correlation
	Rank order correlation	Multiple and partial regression
	Comparison of means	Path analysis

For a comprehensive review of the methods presented in Table 18, see Selvanathan et. al (1994), Kenkel (1996), and Welkowitz (2000).

Descriptive or inferential statistics

The choice of statistics is determined by many previous decisions such as complexity of the research question, the level of measurement of the variables, and the method of analysis. The next task is to select the most appropriate statistics. There are two basic types of statistics: descriptive and inferential. Descriptive statistics are those that summarise the characteristics of the sample. Typically, however, most researchers are interested in generalising from the results in the sample to the population. The function of inferential statistics is to examine whether the patterns described in the sample are likely to apply in the population from which the sample is dawn. For a more comprehensive discussion of descriptive and inferential statistics see Selvanathan et. al (1994), de Vaus (1995), Aaker, Kumar and Day (2000), and Welkowitz (2000).

Data analysis can be conducted using any modern software such as Microsoft Excel, SPSS and SAS. The New South Wales National Parks and Wildlife Service and Environment Australia partnership are generating a custom-built Visitor Data System (New South Wales National Parks and Wildlife Service and Environment Australia 2002) that allows a graphical inspection of data to be undertaken. As with visitor use data (see section 2.3.3.1), if the research goes beyond the needs of management, then statistical advice should be sought.

3.2.4.4 Step 23: Report generation

The report generation process begins by interpreting the results of data analysis in light of the research questions, research design and methodology. This section of the Manual provides guidelines for formatting reports, report writing, tables, and graphs. Examples of reports generated from a series of visitor studies in a diversity of natural areas can be found in Horneman (2001a, 2001b, 2001c, 2001d, 2001e, 2002).

Report Format

Researchers differ in the ways they prepare a research report. The personality, background, expertise, and responsibility of the researcher give each report a unique character. However, for consistency and comparability, survey research reports should contain the following:

1. **Title page**

The title page should include the title of the report, information about the researcher or agency conducting the research (e.g. name, address), and the date of release. The title should indicate the nature of the research project.

2. **Table of contents**

The table of contents should list the topics covered and the appropriate page numbers. In most reports, only the main headings and subheadings are included. The table of contents is followed by a list of tables and list of figures.

3. **Executive/Report summary**

The executive/report summary should concisely describe the problem, approach and research design that was adopted. A summary section should be devoted to the main results, conclusions and recommendations. The executive summary should be written after the rest of the report.

4. **Introduction**

The introductory section of the report should describe the background to the study including the details of where the study was undertaken, by whom, and when. The purpose of the study should also be clearly stated.

5. **Methodology**

This section of the report should specify the details of how the research was conducted, including questionnaire design, administration, data analysis, sample size and missing data, methodological limitations, and special conditions.

6. **Results**

This section is normally the longest section of the report. The results should be organised in a coherent and logical way. The details should be presented in tables and graphs, with the main findings discussed in the accompanying text.

7. **Discussion**

The researcher should interpret the results in light of the research. Presenting a summary of the results in this section is inadequate.

8. Conclusion

The conclusions should be based on the key issues arising from the discussion, and should be directly related to, and address, the research questions and survey objectives.

Report writing

A report should be written for a specific reader or readers. The report should take into account the readers' technical sophistication and interest in the project, as well as the circumstances under which they will read the report and how they will use it. Technical jargon should be avoided. If some technical terms cannot be avoided, briefly define them in an appendix. As a general guide, reports should be objective and concise, presentable and professional in appearance, reinforced with text and graphics, and written so that they are easy to follow and read.

Guidelines for tables

Statistical tables are a vital part of the report. Guidelines for preparing tables are as follows:

- Every table should have a number and title. The title should be brief yet clearly descriptive of the information provided.
- The arrangement of data items in a table should emphasise the most significant aspect of the data. For example, if the data pertain to time, the items should be arranged by appropriate time period.
- The unit of measurement should be clearly stated.
- Instead of ruling the table horizontally or vertically, white spaces are used to set off data items.
- Explanations and comments clarifying the table can be provided in the form of headings, stubs and footnotes. Designations placed over the vertical columns are called headings, those placed in the left-hand column are called stubs. Information that cannot be incorporated into the table should be explained by footnotes.
- If the data contained in the table are secondary, the source of the data should be referenced below the table.

Guidelines for graphics

As a general rule, graphical aids should be used where possible. Graphical display of information can effectively compliment the text and tables to enhance clarity of communication and impact. The guidelines for preparing graphs are the same as those for tables.

3.2.4.5 Step 24: Data storage and retrieval

When analysis is complete, the final task is to ensure that the survey data are appropriately warehoused. Data warehousing involves adding the data to a central database (such as the Visitor Data System), storing the data on site in electronic and physical form, and also storing any reports that have been generated. Best practice requires that all data acquired, and physical reports generated, be recorded in a meta-database which catalogues information relating to the data collection process (e.g. data collection site, name(s) of data collectors, sampling plan, dates etc.). It is essential that clear notes, comments and notations are recorded in the meta-database and with materials that are lodged or stored. In the case of electronic data, the software program including type and version should be written

in permanent ink on the media. Over time, it is good practice to occasionally re-transform the data from an old format to a more updated analytical and reporting format. Modern electronic storage systems generally have a life of approximately five years. It is therefore recommended that all visitor survey data be re-transformed at least every five years.

3.3 Survey Research: Ethical Issues

As with any research that involves human subjects, the survey researcher needs to be attentive to the ethical manner in which the research is conducted. Before undertaking a visitor survey, ethical approval should be sought through the appropriate channels. As a general guideline, the researcher should make sure that no individual suffers any adverse consequences as a result of the survey. Moreover, to the extent that it is feasible, a good researcher will also be attentive to maximising positive outcomes of the research process. For a more detailed discussion of survey research ethics see Fowler (1993), de Vaus (1995), and Bouma (2000). The following are some ethical principles with which all survey researchers should be familiar.

3.3.1 Informing Respondents

The survey research process generally involves enlisting voluntary cooperation. It is a basic premise of ethical survey research that respondents should be informed about what it is they are volunteering for. Respondents should have the following information before being asked to answer questions:

- the name of the organisation undertaking the research; if an interviewer is involved, the respondent should also have the interviewer's name;
- the sponsorship – that is, who is supporting or funding the research;
- a reasonably accurate, though brief, description of the purpose of the research; for example, is the research trying to increase general knowledge, or is their some planning or action process that the research is designed to assist?
- a description of the likely benefits of the study;
- an accurate statement of the extent to which answers are protected with respect to confidentiality; if there are risks to or limits on the confidentiality that is being offered, they should be clearly stated;
- assurance that cooperation is voluntary and that no negative consequences will result to those who decide not to participate in the survey; and
- assurance that respondents can withdraw at any time or decline to answer any particular question.

3.3.2 Protecting Respondents

The main issue with respect to protecting respondents is the way in which the information they provide will be treated. Some standard procedures that survey researchers take to minimise the chances of a breach of confidentiality are as follows.

- All people who have access to the data or a role in the data collection should be committed in writing to confidentiality.

- Minimise links between answers and identifiers. Names and addresses are the most common identifiers. When there are specific identifiers such as names and addresses, they are put on pieces of paper that can be separated physically from the questionnaire in which the actual survey responses are recorded.
- Completed questionnaires should not be accessible to non-project members.
- Identifiers should be removed from questionnaires if non-project staff are going to look at them; it is common to remove them as soon as possible in any case.
- Individuals who could identify respondents from their profile of answers should not be permitted to view the actual questionnaire responses.
- The actual data files will usually have an identification number for each respondent. The link between the identification number and the sample addresses should not be available to general users of the data file.
- During analysis, researchers should be careful about presenting data for very small categories of people who might be identifiable.
- When a project is completed, or when use of the actual questionnaires is over, it is the responsibility of the researcher to dispose of the surveys or warehouse them in secure storage.

Obviously, deviation from these particular procedures may be required for a given project. The general approach and concerns reflected in this set of procedures, however, should typify any responsible survey research project.

3.3.3 Benefits to Respondents

In most surveys, the main benefits to respondents are intrinsic such as enjoying the process of the interview or questionnaire, and feeling they have contributed to a worthwhile effort. More direct benefits such as payment and prizes are sometimes offered. When such benefits are offered, attention must be paid to providing them in a way that does not compromise the promised confidentiality of the survey answers.

3.3.4 Ethical Responsibilities to Interviewers

The researcher has responsibilities to interviewers in two areas. First, the interviewer is given the responsibility of presenting the research to the respondents. It is the researcher's obligation to ensure that interviewers have accurate information about the research. The researcher should not put the interviewer in a position of being deceptive, misleading, or inaccurate. Second, the researcher must deal with interviewer safety. Interviewers should be briefed on sensible procedures regarding interviewer safety.

PART 4

Core questions module

PART 4 CORE QUESTIONS MODULE

This section of the Manual details the core questions that must be included in every visitor survey. The core questions serve as a benchmark against the Australian Bureau of Statistics standard demographic questions and provide a baseline for comparing data across temporal and spatial scales.

1. VISITOR AGE (CORE QUESTION)

What is your age? *(Tick one box)*

18 - 24	25 - 34	35 - 44	45-54	55 - 64	65 or older
☐1	☐2	☐3	☐4	☐5	☐6

The age categories used in the core age question are based on the Australian Bureau of Statistics standard census age classifications, allowing comparisons to be drawn between visitors and the general population. This information is also useful for checking whether the visitors to the area are representative of the general population. Periodical checks of the Australian Bureau of Statistics standard demographic classifications are required over time to ensure changes to classifications are updated.

2. POSTCODE (CORE QUESTION)

Where do you live? Postcode (Australia only) _____

Country (Overseas only) _____

Postcode is used to determine place of residence. Postcode is a useful standard indicator for identifying the geographic market for the area in question. Postcode data can also be compared to Australian Bureau of Statistics census data, and for checking whether the visitors to the area are representative of the general population.

PART 5 QUESTION BANK MODULES: STANDARD QUESTIONS

This section of the Manual contains seven sub-modules of standardised visitor survey questions. The standard visitor survey questions have been tested and validated in a series of visitor surveys across a diversity of natural areas.

5.1 Visitor Characteristics Sub-module

1. GROUP SIZE (STANDARD QUESTION)

Including yourself, how many people were in your personal (i.e. immediate family) travel group?

_____

This standard question has been designed to determine the variation in group size of visitors. An understanding of group size variations is useful for profiling visitors. Such information may also be useful for site planning activities (e.g. designing camp sites and day use areas).

2. GROUP COMPOSITION (STANDARD QUESTION)

Within your personal (i.e. immediate family) travel group, how many were adults and how many were children?

Number of adults _____

Number of children (aged 17 and under) _____

This standard question has been designed to determine group structure by identifying the number of adults and children in each travel group. An understanding of group composition is useful for developing visitor profiles and in planning for the provision of visitor services (e.g. children's activities and programs, and interpretation).

5.2 Travel Characteristics Sub-module

1. FREQUENCY OF VISIT (STANDARD QUESTION)

Including this visit, how many times have you visited [INSERT NAME OF AREA]? *(Tick one box only)*

☐1 Once, this is my first time → GO TO QUESTION X

☐2 2 to 4 times

☐3 5 to 10 times

☐4 More than 10 times

This standard question has been designed to determine frequency of visit. It allows distinctions to be made between first-time and repeat visitors. Results from the pilot studies reveal that first-time and repeat visitor profiles are quite different (see Horneman 2001c, 2001d, 2001e). This question contains a filter ("go to question x") so that if the researcher is interested in how often repeat visitors come to the area in question, first-time visitors can be directed to the next relevant question. Refer to section 3.2.1.6 for guidance on filter questions.

2. LAST TIME VISITED (STANDARD QUESTION)

If you have visited [INSERT NAME OF AREA] more than once, when approximately was the last time? *(Tick one box only)*

☐1 Less than 1 month ago

☐2 More than 1 month, but less than 1 year ago

☐3 Between 1 year and 5 years ago

☐4 More than 5 years ago

This standard question follows on from the preceding question on frequency of visit and has been designed to determine how often repeat visitors go to the area.

3. LENGTH OF STAY FOR DAY USE AREAS ONLY (STANDARD QUESTION)

How long was this visit to [INSERT NAME OF AREA]? *(Tick one box only)*

☐1 Half day (up to 4 hours)

☐2 Full day (4-8 hours)

This standard question has been designed to determine the length of stay in areas that cater for day visitors only.

4. LENGTH OF STAY FOR DAY USE AND OVERNIGHT AREAS (STANDARD QUESTION)

How long was this visit to [INSERT NAME OF AREA]? *(Tick one box only)*

- ☐1 Half day (up to 4 hours)
- ☐2 Full day (4-8 hours)
- ☐3 More than one day, but not overnight
- ☐4 Overnight (Please specify number of nights) _____

This standard question has been designed to determine length of stay to areas that cater for day and overnight visitors. This question is useful for calculating the proportion of, and drawing the distinctions between, day and overnight visitors. Average length of stay can also be calculated for day use areas in terms of hours, and camping areas in terms of number of nights.

5. INDEPENDENT TRAVELLERS VERSUS COMMERCIAL TOURS (STANDARD QUESTION)

Are you visiting this [INSERT TYPE OF AREA] with a commercial tour group? *(Tick one box only)*

- ☐1 Yes
- ☐2 No

This standard question has been designed to determine the proportion of visitors traveling independently or with commercial tour groups.

6. SOURCES OF INFORMATION (STANDARD QUESTION)

Which of the following sources of information did you use when deciding to visit [INSERT NAME OF AREA]? *(Tick all that apply)*

- ☐1 Received no information prior to visit
- ☐2 Previous visit(s)/ prior personal knowledge
- ☐3 Word of mouth
- ☐4 Tourist information centre
- ☐5 Travel guide/book
- ☐6 Television/radio programs
- ☐7 Telephone or written inquiry to park
- ☐8 Newspaper/magazine article
- ☐9 [INSERT AGENCY] brochure
- ☐10 [INSERT AGENCY] website
- ☐11 Other website
- ☐12 Road sign/map
- ☐13 Motoring organisation (e.g. RACQ)
- ☐14 Boating organisation
- ☐15 Other (please specify) _____

This standard question has been designed to determine the sources of information visitors used in deciding to visit the area in question. Information sources not applicable to the area should not be included in the question. For example, if the survey was administered in a terrestrial area, 'boating organisation' may not apply, and therefore could be omitted from the list. This question is useful for identifying the most- and least-used information sources, and suggests areas where funding for marketing and promotion purposes can be best directed.

5.3 Nature of the Visit Sub-module

1. REASONS FOR VISIT (STANDARD QUESTION)

How important was each of the following statements to you as a reason for visiting [INSERT NAME OF THE AREA]? *(Circle a number for each statement)*

No	Statement	Not at all important		Moderately important		Extremely important
1	To rest and relax	1	2	3	4	5
2	To socialise with family/friends	1	2	3	4	5
3	To learn about the [INSERT TYPE OF AREA]	1	2	3	4	5
4	To experience a natural environment	1	2	3	4	5
5	To escape everyday routines	1	2	3	4	5
7	To be physically active	1	2	3	4	5
8	Other _____	1	2	3	4	5

Of the reasons listed above, please circle the number of the statement corresponding to your primary reason for visiting [INSERT NAME OF AREA].

This standard question has been designed to determine the reasons for visiting the area. The question has two components. Firstly, respondents are asked to rate the importance of each reason presented. Secondly, respondents are then asked to indicate which of the reasons listed was their primary reason for visiting the area. Information from this question is useful for developing visitor profiles. An understanding of motivation for visiting the area is important for segmenting visitors based on the types of experiences being sought.

2. LIKED MOST ABOUT VISIT (STANDARD QUESTION)

Thinking about your overall experience, what did you like most about this visit to [INSERT NAME OF AREA]?

_____

_____

_____

This standard question has been designed to elicit the aspects visitors most liked about their visit to the area based on their own frame of reference. Responses to such open-response questions often identify aspects that might not have been detected in closed-response questions. Response rates to this question in the pilot studies were high. For example, 94 per cent of respondents in the Wollomombi Gorge (Oxley Wild Rivers National Park) visitor study responded to this question (see Horneman 2001a).

3. LIKED LEAST ABOUT VISIT (STANDARD QUESTION)

Thinking about your overall experience, what did you <u>like least</u> about this visit to [INSERT NAME OF AREA]?

_____

_____

_____

This standard question has been designed to elicit the aspects visitors least liked about their visit to the area based on their own frame of reference. Responses to such open-response questions often identify aspects that might not have been detected in closed-response questions. Response rates to this question in the pilot studies were high. For example, 89 per cent of respondents in the Carnarvon Gorge study responded to this question (see Horneman 2001c).

4. SITES VISITED (STANDARD QUESTION)

During this visit, tick which sites you have visited at [INSERT NAME OF AREA, e.g. Carnarvon Gorge], and the amount of time you have spent at each site.

		Hours			Hours
☐1	Nature Trail Walk	_____	☐10	Hellhole Gorge	_____
☐2	Main Camp Ground	_____	☐11	The Amphitheatre	_____
☐3	Mickey Creek Gorge	_____	☐12	Aljon Falls and Ward's Canyon	_____
☐4	Warrumbah Gorge	_____	☐13	Big Bend Camping Area	_____
☐5	Rock Pool Walking Track	_____	☐14	Battleship Spur	_____
☐6	Rock Pool	_____	☐15	The Art Gallery	_____
☐7	Baloon Cave	_____	☐16	Cathedral Cave	_____
☐8	Boolimba Bluff	_____	☐17	Visitor Information Centre	_____
☐9	Moss Garden	_____	☐18	Other (please specify) _____	_____

This standard question has been designed to determine which sites have been visited and the length of time spent at each site. The list of sites will vary depending on the area. A copy of the question used in the Carnarvon Gorge pilot visitor study is used as an example of how the standard question may be applied (Horneman 2001c). For further examples, the reader is referred to the Wollomombi Gorge section of Oxley Wild Rivers National Park Visitor Study (Horneman 2001a), the Crowdy Bay National Park Visitor Study (Horneman 2001b), the Kondalilla National Park Visitor Study (Horneman 2001d), the Kenilworth State Forest Visitor Study (Horneman 2001e), and the Bunya Mountains National Park Visitor Study (Horneman 2002). Information collected from this question allows the spatial and temporal distribution of use to be identified across key sites in the area.

5. ACTIVITIES (STANDARD QUESTION)

Which activities have you participated in during this visit to [INSERT NAME OF AREA e.g. Carnarvon Gorge]? *(Tick all that apply)*

☐2	Short walk (less than 2 hours)	☐78	Nature study
☐3	Medium walk (2-4 hours)	☐86	Photography
☐4	Long walk (more than 4 hours)	☐100	Swimming
☐6	Overnight hike	☐134	Visit Aboriginal/cultural sites
☐73	Camping	☐136	Organised park/activity program
☐74	Caravaning	☐138	Commercial (not QPWS) tour
☐76	Campervaning	☐139	Self guided tour
☐77	Picnic/barbeque	☐144	Other _____

This standard question has been designed to determine the activities visitors undertake during their visit to the area. The list of activities will vary depending on the characteristics of the area. A standard activity list, developed as part of the Montreal Process which involved representatives from the Queensland Parks and Wildlife Service and the New South Wales National Parks and Wildlife Service, has been compiled (see pages 79-84) to ensure that the categories used in future visitor surveys are consistent and comparable. Activities that are appropriate to the area should be selected from this list.

If additional activities, not included in the activity bank, that are specific or unique to the area need to be included, the additional activities need to be numbered differently so they can be distinguished from those included in the bank of activities. It is recommended that additional activities be given the same number as the "other" category, followed by a letter from the alphabet to differentiate the different activities. For example, additional activities should be numbered as 144a, 144b, 144c, and so on for the number of additional categories necessary. For the purpose of data entry, each activity should be coded on the basis of whether the activity has been participated in (indicated by the number 1) or not participated in (indicated by the number 0).

A copy of the question used in the Carnarvon Gorge visitor study is used above as an example of how the standard question may be applied (Horneman 2001c). For further examples, the reader is referred to the Wollomombi Gorge section of Oxley Wild Rivers National Park Visitor Study (Horneman 2001a), the Crowdy Bay National Park Visitor Study (Horneman 2001b), the Kondalilla National Park Visitor Study (Horneman 2001d) and the Kenilworth State Forest Visitor Study (Horneman 2001e). Information from this question will assist in developing visitor profiles, and identify the most popular activities undertaken in the area.

Standard Recreation Activity List

ACTIVITY TYPE	General level	Code	Specific level	Code
LAND-BASED ACTIVITIES	Walking	☐1		
			Short walk (less than 2 hours)	☐2
			Medium walk (between 2 and 4 hours)	☐3
			Long walk (more than 4 hours)	☐4
	Running	☐5		
	Overnight hike	☐6		
	Cross country running	☐7		
	Sports/physical games	☐8		
	Skating	☐9		
			Grass skiing	☐10
			Ice skating	☐11
			Skate boarding	☐12
			Roller blading/skating	☐13
			Sand tobogganing	☐14
	Walking pet	☐15		
	Driving/touring	☐16		
			Sightsee/scenic drive	☐17
			2WD touring	☐18
			4WD touring	☐19
			Amphibious vehicles	☐20
			Outdoor recreation vehicles	☐21
	Riding animals (e.g. horse)	☐22		
	Fossicking	☐23		
			Gem collecting	☐24
			Fossil collecting	☐25

			Mineral fossicking	☐26
	Harvesting plant material	☐27		
			Mushrooming	☐28
			Seed collecting	☐29
			Firewood gathering	☐30
			Foliage harvesting	☐31
			Bark harvesting	☐32
	Bee keeping (hobby)	☐33		
	Orienteering	☐34		
	Rogaining	☐35		
	Hunting	☐36		
			Bow and arrow	☐37
			Dogging	☐38
			Shooting	☐39
			Trapping	☐40
	Target shooting	☐41		
			Archery	☐42
			Shooting (firearms)	☐43
			War-games	☐44
	Climbing	☐45		
			Mountain climbing	☐46
			Abseiling/rap jumping	☐47
			Bouldering	☐48
			Canyoning	☐49
			Lead climbing	☐50
			Top roping	☐51
	Mountain biking	☐52		
			Cross country	☐53

			Down hill	☐54
			Exploring	☐55
			Slalom	☐56
			Trials	☐57
	Road cycling	☐58		
			Bike circuit (one day or less travel)	☐59
			Bike touring (more than one days travel)	☐60
	Motor cycle riding	☐61		
			Trail bike riding	☐62
			Road touring	☐63
			Motorcross	☐64
			Trails riding	☐65
			Quad/trike riding	☐66
	Snow activities	☐67		
			Skiing (down hill, cross country)	☐68
			Snow boarding	☐69
			Tobogganing	☐70
			Snow play	☐71
	Overnighting	☐72		
			Camping	☐73
			Caravaning	☐74
			Cabins	☐75
			Campervans	☐76
	Picnic/barbeque	☐77		
	Nature study	☐78		
			Cultural heritage appreciation	☐79
			Astronomy/star gazing	☐80

			Bird watching	☐81
			Frog watching	☐82
			Mammal watching	☐83
			Scenery	☐84
			Wild flower viewing	☐85
			Photography	☐86
	Observe wildlife	☐87		
AERIAL-BASED ACTIVITIES	Aerial - motorised	☐88		
			Flying helicopters	☐89
			Flying ultralight aircraft	☐90
			Flying other fixed-wing aircraft	☐91
	Aerial – non-motorised	☐92		
			Ballooning	☐93
			Parachuting (from fixed-wing)	☐94
			Gliding (fixed-wing conventional gliders)	☐95
			Self-launched activities (e.g. hang gliding)	☐96
WATER-BASED ACTIVITIES	Transit	☐97		
	Touring	☐98		
	Commercial tour	☐99		
	Swimming	☐100		
	Surfing	☐101		
			Body surfing	☐102
			Boogie boarding/body boarding	☐103
			Surf boarding	☐104
	Water play	☐105		
	Scuba diving	☐106		
	Snorkelling	☐107		

	Fishing	☐108		
			Line fishing (fly fishing, lure fishing, bait fishing)	☐109
			Net/trap fishing	☐110
			Yabbying	☐111
			Spear fishing	☐112
	Motor boating	☐113		
			Jet skiing	☐114
			Jet boating	☐115
			Hovercraft driving	☐116
	Water skiing	☐117		
			Wake boarding	☐118
			Trick skiing	☐119
	Paddling	☐120		
			Surf skies/wave skis	☐121
			Rafting	☐122
			Canoeing/kayaking	☐123
	Rowing/skulling	☐124		
			Rowing shells	☐125
			Dinghy/row boat	☐126
			Surf boat	☐127
	Sailing	☐128		
			Dinghy sailing	☐129
			Kite surfing	☐130
			Sailboarding	☐131
			Yachting	☐132
PLACES	Visit historic sites	☐133		
	Visit Aboriginal sites	☐134		

	Visit information centre	☐135		
PROGRAM-RELATED ACTIVITIES	Organised activity/ program	☐136		
	Talk with rangers	☐137		
	Commercial tour	☐138		
	Self-guided tour	☐139		
FESTIVALS/EVENTS	Attend cultural festival	☐140		
	Attend music festival	☐141		
	Attend sports event	☐142		
OTHER	Meal in restaurant/café	☐143		
	Other _____	☐144		

6. ADDITIONAL COMMENTS (STANDARD QUESTION)

Are there any additional comments you would like to make about this visit to [INSERT NAME OF AREA]?

_____

_____

_____

_____

This standard open-response question has been designed to allow visitors to express additional comments about their visit based on their own frame of reference.

5.4 Interpretation and Education Sub-module

1. EVALUATION OF INTERPRETATION (STANDARD QUESTION)

The [INSERT NAME OF AGENCY] is interested in your evaluation of interpretation provided at [INSERT NAME OF AREA e.g. Carnarvon Gorge]. How do you rate each of the following sources of information or interpretation?

	Good	Fair	Poor	Not aware existed	Aware existed but did not use
Park brochure	☐1	☐2	☐3	☐4	☐5
Park map	☐1	☐2	☐3	☐4	☐5
Park notice board/whiteboard	☐1	☐2	☐3	☐4	☐5
Visitor centre displays/exhibits	☐1	☐2	☐3	☐4	☐5
Assistance from park staff	☐1	☐2	☐3	☐4	☐5
Self-guided walk signs	☐1	☐2	☐3	☐4	☐5
Commercial (not QPWS) tours	☐1	☐2	☐3	☐4	☐5
Ranger-led activities/programs	☐1	☐2	☐3	☐4	☐5
Other _____	☐1	☐2	☐3	☐4	☐5

This standard question has been designed to determine how visitors evaluate interpretation provided at the area in question. The types of interpretation listed will vary with each area. A copy of the question used in the Carnarvon Gorge visitor study is used as an example of how the standard question may be applied (Horneman 2001c). For further examples, the reader is referred to the Kondalilla National Park Visitor Study (Horneman 2001d) and the Kenilworth State Forest Visitor Study (Horneman 2001e). Information from this question allows you to identify those services that are rated well and those services that are rated poorly. The question also allows you to understand the awareness levels of visitors concerning interpretation provided at the area.

5.5 Visitor Spending Sub-module

The standard questions contained in the Visitor Spending Sub-module require responses to several questions from other modules for interpretation. Where additional questions need to be included in the questionnaire to interpret results, it is indicated in the text.

If local issues are to be explored, then it becomes important to determine whether spending occurs within or outside of a designated region. The region may be, for example, a local government area, or a town where the area is located. If a region is specified, then a map must be provided with the questionnaire, and must clearly show the boundary of the region. If possible, the map should also show the locations of towns or other landmarks on either side of the region's border to assist the visitor who may be unfamiliar with the region.

The standard questions have been designed to collect information to address several economic issues. The simplest interpretation of the data on visitor spending is to report on general visitor expenditure patterns. The information can be converted into an estimate of annual visitor expenditure if the number of visitors to the area in question during a particular time frame is known. However, expenditure should be reported with caution so as not to over- or under-estimate the amount attributed to visitation of an area. Other possible uses of information on visitor spending include an investigation of the economic benefits of an area to the region. This is based on an evaluation of both the expenditure made within the designated region, and other details about the visitor's trip.

The complexity of analysis required to interpret the visitor spending data depends on the type of output required. Before contemplating using the visitor spending questions in a survey, expert assistance should be sought.

1. TRAVEL DECISION AND EXPENDITURE (STANDARD QUESTION)

If [INSERT NAME OF AREA] did not exist would you have still taken this trip to [INSERT NAME OF REGION] ? *(Tick one box only)*

Yes, we would have spent the same amount of time/number of days in [INSERT NAME OF REGION]	☐1
Yes, but we would have spent less time/fewer days in [INSERT NAME OF REGION]	☐2
No, we would have travelled elsewhere	☐3
No, we would not have taken this trip	☐4
Don't know	☐5

This question is designed to determine the extent to which a visitor's expenditure in the region is due to their visit to the area. For example, if the visitor would have travelled to the region regardless of being able to visit the area, (the first response category), then a smaller proportion of the amount spent would be attributed to the area than if their visit to the area was the main purpose of their trip (the third and fourth response categories).

2. NIGHTS SPENT AWAY FROM HOME (STANDARD QUESTION)

On this trip, how many nights will you spend away from home? _____ Nights

This standard question has been designed to compute average daily expenditure using information on the trip as reported in the table in question 6. Even if daily rather than total expenditure is reported in question 6 in this sub-module, the trip length is still useful to validate other responses on spending, such as for visitors who may have spent more on airfares or other expenses as part of a long trip to several destinations.

3. LENGTH OF TIME SPENT IN REGION (STANDARD QUESTION)

Including your visit to [INSERT NAME OF AREA], approximately how long will you spend in the [INSERT NAME OF REGION] on this trip?

Number of hours _____

Number of days _____

This standard question has two purposes. Similar to question 2, it is used to calculate average daily expenditure - in this case, the amount spent within the region. It may also be an indicator of the strength of the area to attract visitors to the region. For example, if the response to question 1 (on the existence of the area) suggests that the area is the reason for a visit to the region, then question 3 can be used to indicate the contribution of the area to the region. It may be useful to consider the proportion of time spent in the region as part of the whole trip, or the additional time (and money) spent in the region beyond what is spent in the area. Further detail can be obtained from the regional column in the expenditure table in question 6.

4. ACTIVITY AND TRIP PATTERN (STANDARD QUESTION)

If any of the activities that you participated in had not been available, would you still have visited [INSERT NAME OF AREA]? *(Tick one box only)*

Yes, would not have changed trip	☐1
Yes, but for less time	☐2
No	☐3
Don't know	☐4

This question can be used to indicate the importance of particular activities to the visit. This question is similar to question 1 which identifies the importance of the area for visiting the region. The importance of the activity may be used to determine a proportion of the visitor's spending (on their overall trip) that is due to the opportunity of participating in an activity or activities, particularly if the activity is a primary purpose for the trip (third response category). This question should be asked after the question on participation in activities (see section 5.3).

5. TRANSPORT USED FOR LAST LEG OF TRIP (STANDARD QUESTION)

What form of transport did you use on the last leg of your trip to arrive at [INSERT NAME OF AREA]?
(Tick one box only)

- ☐1 Walk
- ☐3 Passenger (2WD) vehicle
- ☐4 4WD vehicle
- ☐5 Campervan/motorhome
- ☐6 Motorcycle
- ☐8 Tour bus/coach
- ☐12 Other (Please specify) _____

This question has been designed to determine the transport mode used by visitors on the "last leg" of their trip to the area. The "last leg" of the trip refers to travel between the last stopover (e.g. the place stayed the night before) and the area. For longer trips, and those involving several modes of transportation, this question will clarify that mode used to arrive at the area. This information could be relevant to issues such as parking availability. The types of transport modes will depend on the location of the area to transport networks. A standard list of transport modes has been compiled to ensure that the categories used in future visitor surveys are consistent and comparable (see below). Transport modes accessible to the area should be selected from this list, those that do not apply should not be included in the survey.

Standard List of Transport Modes

Code	Mode of transport
☐1	Walk
☐2	Bicycle
☐3	Passenger (2WD) vehicle
☐4	4WD vehicle
☐5	Campervan/motorhome
☐6	Motorcycle
☐7	Boat
☐8	Tour bus/coach
☐9	Public bus
☐10	Taxi
☐11	Rail
☐12	Aeroplane
☐13	Other (Please specify) _____

6. TRIP EXPENDITURE (STANDARD QUESTION)

What is the approximate amount that you and your personal (i.e. immediate family) travel group have spent/will spend during you return trip between home and the [INSERT NAME OF REGION], for each of the following categories? *(Please estimate any expenses to date and for the remainder of your trip regardless of payment method. Include payments that have been made in advance only if they are for services received during this trip such as prepaid accommodation. For those respondents travelling on a commercial package tour, please indicate the total cost of the package and what is included, and fill in the table for other expenses not covered as part of the package cost).*

Category	Expenditure within [INSERT NAME OF REGION]	Expenditure elsewhere in Australia
Accommodation, camping	$	$
Holiday package which includes _____	$	$
Takeaways or restaurant meals	$	$
Groceries (including food and drink)	$	$
Other supplies (maps, camping equipment, etc.)	$	$
Transport fares (train, bus, plane)	$	$
Hire car	$	$
Petrol	$	$
Motor vehicle parts, repairs	$	$
Laundry or other services (please specify) _____	$	$
Activities or entertainment (e.g. attractions, tours)	$	$
Souvenirs or other shopping	$	$
Other (please specify) _____	$	$

This question is the main source of information on visitor expenditure. Categories contained in the table that are not relevant to the region should not be included in the table for the survey. Two columns are recommended with the first being a region of interest and the second being

either state (e.g. the remainder of Queensland) or country based (e.g. remainder of Australia). If a region is specified, a map must accompany the questionnaire.

With further analysis, information from the table can be used to approximate the dollar contribution of the area to the region, as well as to estimate the value of the area for tourism. Before undertaking further analysis, advice should be sought from an expert who has experience in analysing economic and visitor spending survey questions. In addition, it may be useful to include other questions on visitor characteristics, in order to investigate whether certain demographic groups are responding in different ways (e.g. are higher income groups more willing to pay a fee for a slide show).

Given information on annual number of visitors, an estimate of average per-person expenditure can be calculated, provided that the data collected can be validated with additional questions. The questions that are essential or recommended from the other sub-modules, and that need to be included in the survey to interpret the results from question 6, are presented below:

Module	Question	Rationale
Visitor Characteristics Sub-module (SQ), Section 5.1, question 1 (Essential)	Including yourself, how many people are in your personal (i.e. immediate family) travel group?	Use to determine average cost per person.
Visitor Characteristics Sub-module (SQ), Section 5.1, question 2 (Essential)	Within your personal (i.e. immediate family) travel group, how many were adults and how many were children?	Use to determine average cost per person, and to distinguish between different pricing for adults and children.
Travel Characteristics Sub-module (SQ), Section 5.2, question 5 (Essential)	Are you visiting this [INSERT TYPE OF AREA] with a commercial tour group?	Use to determine if expenditure was based on a commercial package tour.
Travel Characteristics Sub-module (BPQ), Section 6.2, question 1 (Essential)	Where did you stay while visiting [INSERT NAME OF AREA]?	To interpret the amount spent on accommodation.
Travel Characteristics Sub-module (BPQ), Section 6.2, question 3 (Essential)	Where did you stay the night before arriving at [INSERT NAME OF AREA]?	To determine if spending was associated with accommodation at this location. Also required for travel cost model.
Travel Characteristics Sub-module (BPQ), Section 6.2, question 4 (Recommended)	Where did you stay the night after leaving [INSERT NAME OF AREA]?	To determine if spending was associated with accommodation at this location. Also required for travel cost model.
Travel Characteristics Sub-module (BPQ), Section 6.2, question 5 (Essential)	What form of transport did you use to travel to [INSERT NAME OF AREA]?	This information is used to determine travel cost, as well as to narrow down the form of transport if several options were used, and to provide information for issues such as parking or other accessibility options.

Travel Characteristics Sub-module (BPQ), Section 6.2, question 6 (Essential)	Thinking of your trip, was this visit to [INSERT NAME OF AREA]:	This is used to determine the proportion of expenditure that is due to the visit to the area. If the area is the main purpose of the trip, then more expenditure is due to the area than if the area was not a planned destination.
Travel Characteristics Sub-module (BPQ), Section 6.2, question 7 (Recommended)	Which category best describes the group you are travelling with?	This will provide additional insight to the spending patterns – for example, a family may have different spending patterns than a group of friends.
Visitor Characteristics Sub-module (SQ), Section 5.2, question 1 (Recommended)	Including this visit, how many times have you visited [INSERT NAME OF AREA]?	This is useful to see if spending patterns (and length of trip) vary between new and repeat visitors.
Visitor Characteristics Sub-module (SQ), Section 5.2, question 3 or 4 (Essential)	How long was this visit to [INSERT NAME OF AREA]?	Use this information to determine if there is any relationship between the length of the visit and amounts spent. For example, a half-day visit may not require spending on food. This is also used to determine what proportion of expenditure in the region is based on time spent within and outside of the area.
Nature of the Visit Sub-module (SQ), Section 5.3, question 5 (Recommended)	Which activities have you participated in during this visit to [INSERT NAME OF AREA]?	Use to see if there are any relationships between spending and activities (such as costs of equipment or other supplies).

SQ: Standard Question

BPQ: Best Practice Question

5.6 Visitor Satisfaction Sub-module

1. VISITOR SATISFACTION WITH FACILITIES AND SERVICES (STANDARD QUESTION)

Please indicate your level of satisfaction with each of the following facilities and services provided at [INSERT NAME OF AREA]. *(Circle a number for each attribute)*

	Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
Staff (e.g. availability, attitude, presence)	1	2	3	4	5
Maintenance of sites within the [INSERT TYPE OF AREA] (e.g. cleanliness, presentation)	1	2	3	4	5
Design of sites within the [INSERT TYPE OF AREA] (e.g. location, safety, layout)	1	2	3	4	5
Access to sites within the [INSERT TYPE OF AREA] (e.g. number of sites)	1	2	3	4	5
Maintenance and upkeep of [INSERT TYPE OF AREA] facilities (e.g. cleanliness, presentation)	1	2	3	4	5
Design of [INSERT TYPE OF AREA] facilities (e.g. location, safety, size, practicality, appropriateness)	1	2	3	4	5
Management of visitors in the [INSERT TYPE OF AREA] (e.g. noise, crowding, behaviour of others)	1	2	3	4	5

This standard question has been designed to determine the level of visitor satisfaction with a variety of facilities and services provided at the area. Information from this question allows the identification of problematic aspects of the visitor's experience that need attention. Management actions can then be implemented to remedy the situation.

For surveys that are interview-administered, questions about visitor satisfaction should be asked at the end of the visit to the area in question.

5.7 Natural Area Management Sub-module

1. RATING OF MANAGEMENT (STANDARD QUESTION)

Reflecting on this visit, how well do you think [INSERT NAME OF AREA] is being managed? (*Tick one box only)*

☐1	☐2	☐3	☐4	☐5	☐6
Very well	Well	Average	Poorly	Very Poorly	Don't know

This standard question has been designed to determine how well respondents think the area is being managed. Information obtained from this question can be used to justify and support current plans of management.

2. REASONS FOR GOOD MANAGEMENT (STANDARD QUESTION)

In what ways do you think the [INSERT TYPE OF AREA] is being managed well?

_____

_____

_____

3. REASONS FOR HOW MANAGEMENT COULD BE IMPROVED (STANDARD QUESTION)

In what ways do you think the management of the [INSERT TYPE OF AREA] could be improved?

_____

_____

_____

These two standard open-response questions have been designed to elicit why visitors think the area is being well managed, and how the management of the area could be improved based on their own frame of reference. Information obtained from these questions could feed into the planning and management processes of the area. Responses to such open-response questions often identify aspects that might not have been detected in closed-response questions. Response rates to these two questions in the pilot studies were high. For example, 78 per cent and 62 per cent of respondents in the Carnarvon Gorge visitor study responded to these questions respectively (see Horneman 2001c).

PART 6

Question bank modules: best practice questions

PART 6 QUESTION BANK MODULES: BEST PRACTICE QUESTIONS

This section of the Manual contains six sub-modules of best practice visitor survey questions. The best practice questions were chosen from a review of visitor surveys and workshops with staff from various natural resource and land management agencies. All best practice questions and their formats use either Australian Bureau of Statistics or known best practice categories.

6.1 Visitor Characteristics Sub-module

1. VISITOR AGE PROFILE FOR TRAVEL GROUP (BEST PRACTICE QUESTION)

For yourself and each member in your personal (i.e. immediate family) travel group, please indicate the age of each person. *(Tick all that apply)*

	< 18 years	18-24	25-34	35-44	45-54	65 or older
Yourself	☐1	☐2	☐3	☐4	☐5	☐6
Person 2	☐1	☐2	☐3	☐4	☐5	☐6
Person 3	☐1	☐2	☐3	☐4	☐5	☐6
Person 4	☐1	☐2	☐3	☐4	☐5	☐6
Person 5	☐1	☐2	☐3	☐4	☐5	☐6
Person 6	☐1	☐2	☐3	☐4	☐5	☐6

This question has been designed to determine the age profile of visitors in each personal travel group. Although the core survey module contains a standard age question, it may sometimes be useful to know the age distribution of visitors in each travel group. If this question style is the preferred option, then disregard the core age question.

2. GENDER (BEST PRACTICE QUESTION)

What is your gender? *(Tick one box only)*

☐1 Male

☐2 Female

This question has been designed to determine the gender of visitors.

3. ETHNICITY (BEST PRACTICE QUESTION)

What is your ethnic background? _____

This question has been designed to determine the ethnicity of visitors.

4. LANGUAGE (BEST PRACTICE QUESTION)

Is English the primary language you speak?

☐1 Yes

☐2 No (please specify language) _____

This question has been designed to determine the range of languages spoken by visitors.

5. EMPLOYMENT STATUS (BEST PRACTICE QUESTION)

Which of the following best describes your present employment status? *(Tick one box only).*

☐1 Unemployed

☐2 Homemaker

☐3 Student

☐4 Employed, part time

☐5 Employed, full time

☐6 Pensioners/Retired

This question has been designed to determine the employment status of visitors. The employment categories are consistent with the Australian Bureau of Statistics standard classification, allowing comparisons to be drawn between visitors and the general population.

6. OCCUPATIONAL STATUS (BEST PRACTICE QUESTION)

Which of the following best describes your present occupation? *(Tick one box only)*

☐1 Managers and administrators

☐2 Professionals

☐3 Para-professionals

☐4 Tradespersons

☐5 Clerks

☐6 Salespersons and personal service workers

☐7 Plant and machine operators, and drivers

☐8 Labourers and related workers

This question has been designed to determine the occupational profile of visitors. The categories are consistent with the Australian Bureau of Statistics standard classification, allowing comparisons to be drawn between visitors and the general population.

7. MARITAL STATUS (BEST PRACTICE QUESTION)

Which of the following best describes your marital status? *(Tick one box only)*

- ☐1 Never married
- ☐2 Married
- ☐3 De facto
- ☐4 Separated
- ☐5 Divorced
- ☐6 Widowed

This question has been designed to determine the marital status of visitors. The marital categories are consistent with the Australian Bureau of Statistics standard classification, allowing comparisons to be drawn between visitors and the general population.

8. EDUCATION LEVEL (BEST PRACTICE QUESTION)

Which of the following best describes your highest level of education? *(Tick one box only)*

- ☐1 No education or pre-primary education
- ☐2 Primary school education
- ☐3 Secondary school education
- ☐4 Technical/TAFE education
- ☐5 Trade qualification
- ☐6 Higher education (university)

This question has been designed to determine the educational profile of visitors. The educational categories are consistent with the Australian Bureau of Statistics standard classification, allowing comparisons to be drawn between visitors and the general population.

9. HOUSEHOLD INCOME (BEST PRACTICE QUESTION)

Which bracket best describes your household's combined annual income? *(Tick one box only)*

- ☐1 Less than $20,000
- ☐2 $20,000 - $29,999
- ☐3 $30,000 - $39,999
- ☐4 $40,000 - $49,999
- ☐5 $50,000 - $69,999
- ☐6 $70,000 or more
- ☐7 Don't know

This question has been designed to determine the household income profile of visitors. The income categories are consistent with the Australian Bureau of Statistics standard classification, allowing comparisons to be drawn between visitors and the general population.

6.2 Travel Characteristics Sub-module

1. ACCOMMODATION (BEST PRACTICE QUESTION)

Where did you stay while visiting [INSERT NAME OF AREA]? *(Tick one box only)*

- ☐1 Luxury hotel/luxury serviced apartment/luxury resort (4-5 star)
- ☐2 Standard hotel/motel/motor inn (below 4 star)
- ☐4 Self-catering accommodation (e.g. house, apartment, unit)
- ☐7 (INSERT NAME OF AREA) campground
- ☐8 Other camp ground
- ☐11 Residence, friend, relative
- ☐13 Other (please specify) _____

This question has been designed to determine the type of accommodation used by visitors while visiting the area. The types of accommodation categories will vary depending on the location of the area. A standard list of accommodation has been compiled to ensure that the categories used in visitor surveys are consistent and comparable (see below). Accommodation types located in or close to the area should be selected from this list. Accommodation categories that do not apply to the area in question should not be included in the question.

Standard List of Accommodation Categories

Code	Accommodation Type
☐1	Luxury hotel/luxury serviced apartment/luxury resort (4-5 star)
☐2	Standard hotel/motel/motor inn (below 4 star)
☐3	Guest house/bed and breakfast
☐4	Self-catering accommodation (e.g. house, apartment, unit)
☐5	Visitor hostel (e.g. youth, backpacker)
☐6	Caravan park
☐7	(INSERT NAME OF AREA) campground
☐8	Other camp ground
☐9	Caravan or camping by side of road
☐10	Group booked accommodation
☐11	Residence, friend, relative
☐12	Boat, houseboat, cabin cruiser, or cruise ship
☐13	Other (Please specify) _____

2. ON-SITE ACCOMMODATION (BEST PRACTICE QUESTION)

If you camped on-site, what style of accommodation did you use? *(Tick one box only)*

☐1 Tent

☐2 Campervan

☐3 Camper trailer

☐4 Caravan

☐5 Other (please specify) _____

This question has been designed to determine the specific styles of accommodation used by visitors who camped on-site in the area.

3. PLACE STAYED NIGHT BEFORE (BEST PRACTICE QUESTION)

Where did you stay the night before arriving at [INSERT NAME OF AREA]? *(Please name the suburb or town)*

_____

4. PLACE STAYED NIGHT AFTER (BEST PRACTICE QUESTION)

Where did you stay the night after leaving [INSERT NAME OF AREA]? *(Please name the suburb or town)*

_____

These two open-ended questions have been designed to determine where visitors stayed the night before and the night after their visit to the area in question. Information from this question may be used to identify the main traffic routes used by visitors to access the area.

5. MODE OF TRANSPORT (BEST PRACTICE QUESTION)

What form of transport did you use to travel to [INSERT NAME OF AREA]? *(Tick all that apply)*

☐1 Walk

☐3 Passenger (2WD) vehicle

☐4 4WD vehicle

☐5 Campervan/motorhome

☐6 Motorcycle

☐9 Tour bus/coach

☐14 Other (Please specify) _____

This question has been designed to determine the mode of transport used by visitors to access the area. The types of transport modes will depend on the location of the area to transport networks. A standard list of transport modes has been compiled to ensure that the categories used in future visitor surveys are consistent and comparable (see below). Transport modes accessible to the area should be selected from this list, those that do not apply should not be included in the question.

Standard List of Transport Modes

Code	Mode of transport
☐1	Walk
☐2	Bicycle
☐3	Passenger (2WD) vehicle
☐4	4WD vehicle
☐5	Campervan/motorhome
☐6	Motorcycle
☐7	Passenger lines and ferries
☐8	Other water transport (e.g. cruise, private boat, yacht)
☐9	Tour bus/coach
☐10	Public bus/coach
☐11	Taxi
☐12	Railway
☐13	Aeroplane
☐14	Other (Please specify) _____

6. TRAVEL PATTERNS (BEST PRACTICE QUESTION)

Thinking of your trip, was this visit to [INSERT NAME OF AREA] *(Tick one box only)*

- ☐1 the main purpose of your trip
- ☐2 one of several (INSERT TYPE OF AREA) visited on this trip
- ☐3 one of several destinations on this trip
- ☐4 not a planned destination on this trip
- ☐5 other (please specify) _____

This question has been designed to determine the travel patterns of visitors to the area. An understanding of travel patterns is useful for marketing and promoting the area either as a single destination or as part of a multi-destination trip depending on predominant trip patterns.

7. GROUP TYPE (BEST PRACTICE QUESTION)

Which category best describes the group you are traveling with? *(Tick one box only)*

- ☐1 Individual
- ☐2 A couple
- ☐3 Family
- ☐4 Friends
- ☐5 Family and friends
- ☐6 Club/organisation
- ☐7 Commercial tour group
- ☐8 Special interest group
- ☐9 School group
- ☐10 Other (please specify) _____

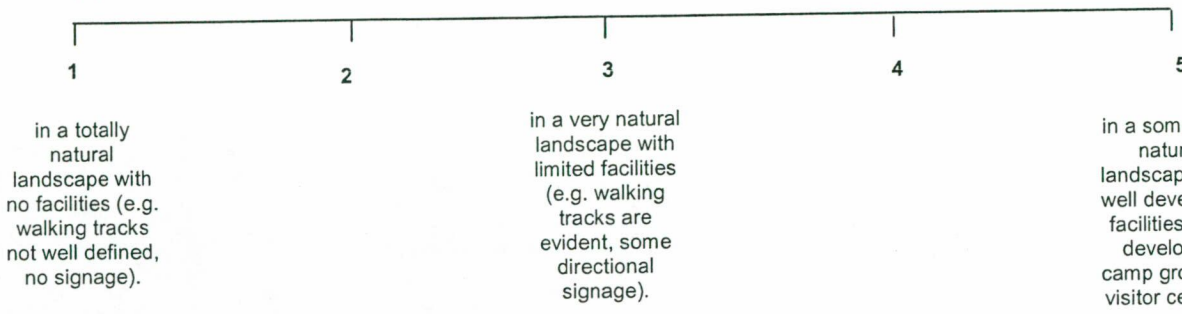
This question has been designed to determine the type of group visitors are traveling with to the area in question.

6.3 Nature of the Visit Sub-module

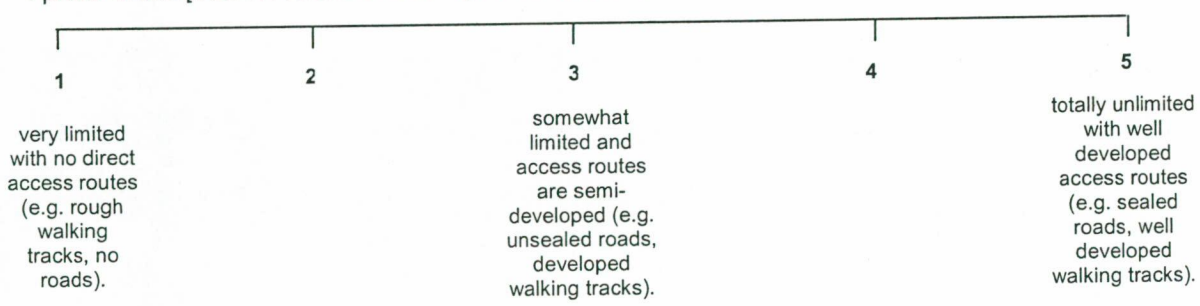
1. VISITOR PREFERENCES (BEST PRACTICE QUESTION)

The [INSERT NAME OF AGENCY] would like to know your preferences for certain "experiences" when visiting [INSERT TYPE OF AREA]. For each of the following, please circle the number that best matches your personal preference.

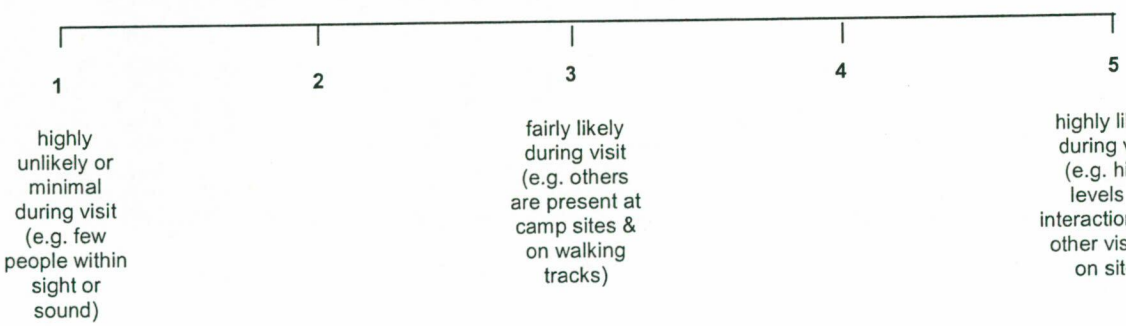
My preferred [INSERT TYPE OF AREA] experience is…



I prefer to visit [INSERT NAME OF AREA] where access is…



I prefer to visit [INSERT TYPE OF AREA] where meeting others is…



This question has been designed to explore three dimensions of visitor preference. The first dimension focuses on the experience most preferred by respondents. The second dimension focuses on the level of accessibility most preferred by respondents, while the third dimension focuses on the preferred likelihood of meeting others during their visit. This question has a broader focus than the other questions, as it is directed toward visitation to the type of area in question generally. The information from this question allows for comparisons to be made between visitors based on preferences for facilities, access, and likelihood of meeting other visitors.

6.4 Interpretation and Education Sub-module

1. ADEQUACY OF INTERPRETATION PROVIDED (BEST PRACTICE QUESTION)

During this visit, did you receive enough information about [INSERT NAME OF AREA]? *(Tick one box only)*

☐1 Yes → GO TO QUESTION X

☐2 No

This question was designed to determine whether visitors found the information provided at the area adequate. If visitors found the information adequate, a filter ("go to question x") is provided to guide them to the next relevant question. A follow-up question may then be presented to those who responded "no" (Question 2).

2. ADDITIONAL INTERPRETATION (BEST PRACTICE QUESTION)

If no, what other additional information would you like to access about this area?

_____

_____

_____

This question was designed to elicit responses from the visitor's own frame of reference. Information from this question may be useful in designing new interpretation services for visitors.

6.5 Visitor Spending Sub-module

1. IMPORTANCE OF SERVICES AND FACILITIES (BEST PRACTICE QUESTION)

Please indicate the services and facilities that you used during your visit to [INSERT NAME OF AREA], and how important they were to your visit.

Service or facility	Have you used		If not available, would you have:	
Toilets	☐1	Yes	☐1	not visited at all
	☐2	No	☐2	spent less time
			☐3	no effect – spent same amount of time
Picnic Areas	☐1	Yes	☐1	not visited at all
	☐2	No	☐2	spent less time
			☐3	no effect – spent same amount of time
Visitor Centre	☐1	Yes	☐1	not visited at all
	☐2	No	☐2	spent less time
			☐3	no effect – spent same amount of time

The list of services and facilities included in the question will depend on the area in question. Responses to this question may be used to support decisions on provision of infrastructure and services. This question is designed to indicate the importance of particular services to the (length of the) visit to the area (see section 5.2, question 3 or 4). The results from this question could also be compared to the responses obtained from the visitor expenditure question (see section 5.5, question 6) to evaluate any relationship to expenditure. (For example, a family may have spent the day at the area in question to have a picnic with food purchased at a local bakery, when without the facilities they may have only visited for a half day and not purchased food within the region).

2A. WILLINGNESS TO PAY (UNDISCLOSED AMOUNT) (BEST PRACTICE QUESTION)

If the [INSERT NAME OF AREA] were to ask for a gold coin donation for [INSERT ACTIVITY], would you be willing to make such a donation for this service?

Yes ☐1

No ☐2

OR

2B. WILLINGNESS TO PAY (DISCLOSED AMOUNT) (BEST PRACTICE QUESTION)

If the [INSERT NAME OF AREA] were to ask for a donation for [INSERT ACTIVITY], would you be willing to make a donation for this service? *(Tick one box only)*

Yes, up to $ [INSERT DOLLAR VALUE] ☐1

Yes, gold coin only ☐2

No ☐3

This question has been designed to determine the potential demand for services (particularly those that may only be able to be provided for a fee). Information collected could also be used to determine willingness to pay for increased availability or quality of existing services. Two options are provided here depending on circumstance. The willingness to pay (disclosed amount) question is more precise and more useful for modelling.

When formatting the question, select an appropriate dollar value for the second option. If desired, both versions of the question may be used by distributing some surveys with each version. Surveys with different dollar values may also be distributed to see if responses vary at different price levels.

6.6 Visitor Satisfaction Sub-module

1. OVERALL SATISFACTION (BEST PRACTICE QUESTION)

Overall, how satisfied were you with this visit to [INSERT NAME OF AREA]?

☐1	☐2	☐3	☐4	☐5	☐6	☐7
Terrible	Unhappy	Mostly dissatisfied	Mixed feelings	Mostly satisfied	Pleased	Delighted

This question has been designed to determine the overall satisfaction level of visitors to the area. The Delighted-Terrible (D-T) Scale used in this question has been found to be one of the most reliable single satisfaction measurement scales (see for example, Westbrook and Oliver (1991)). However, single-item satisfaction questions should not be solely relied on for decision-making because of their general application.

2. OVERALL SATISFACTION WITH SERVICE AND FACILITY QUALITY (BEST PRACTICE QUESTION)

Overall, how would you rate the quality of the visitor services and facilities at [INSERT NAME OF AREA]?

☐1	☐2	☐3	☐4	☐5
Very good	Good	Average	Poor	Very poor

This question has been designed to determine the overall satisfaction of visitors with the services and facilities provided at the area.

3. OVERALL EXPECTATION (BEST PRACTICE QUESTION)

How would you rate this visit overall?

☐1	☐2	☐3	☐4	☐5	☐6	☐7
Far better than expected	Much better than expected	Better than expected	Neither better or worse than expected	Worse than expected	Much worse than expected	Far worse than expected

This question has been designed to determine whether visitor expectations with their overall visit have been met.

4. IMPORTANCE RATINGS OF AREA'S ATTRIBUTES (BEST PRACTICE QUESTION)

Thinking about your experiences at [INSERT NAME OF AREA}, how would each of the following effect your enjoyment? *(Circle a number for each statement).*

	Would not worry me at all	Would effect my enjoyment slightly	Would effect my enjoyment quite a lot	Would ruin my visit to this park	No opinion
Interpretation/Information					
Inadequate maps and directional signs in area	1	2	3	4	5
Not having enough information to pre-plan visit	1	2	3	4	5
Inadequate information on plants and animals	1	2	3	4	5
Inadequate information on cultural heritage of area	1	2	3	4	5
No staff available or present	1	2	3	4	5
No visitor centre	1	2	3	4	5
Environment/Experience					
Very few sightings of native wildlife	1	2	3	4	5
Large numbers of people in picnic areas	1	2	3	4	5
Large number of people on walking tracks	1	2	3	4	5
Close proximity of other campers	1	2	3	4	5
Unruly behaviour of other visitors	1	2	3	4	5
Noisy people or activities	1	2	3	4	5
Degraded condition of natural environment	1	2	3	4	5
Facilities/Maintenance					
Too few easy walking tracks	1	2	3	4	5
No challenging walks	1	2	3	4	5
Rubbish/litter	1	2	3	4	5
Poorly maintained walking tracks	1	2	3	4	5
No drinking water provided	1	2	3	4	5
Dirty toilets	1	2	3	4	5
Roads in rough condition	1	2	3	4	5
Little or no firewood provided	1	2	3	4	5
Barbeques in poor condition	1	2	3	4	5
Poorly maintained picnic grounds	1	2	3	4	5
Poorly maintained campsites	1	2	3	4	5
Poorly maintained showers	1	2	3	4	5

Source: Archer and Griffin (2002)

This question measures the importance visitors place on a wide array of natural area attributes. A number of approaches for measuring the importance of an area's attributes have been tested by Archer and Griffin (2002). For example, using the scale "very important" to "of no importance" produced clustered responses, with virtually all responses being rated at least "important". Archer and Griffin (2002) found the best approach was to measure importance in a less abstract manner, by asking visitors to consider the likely impact of a range of situations on their level of enjoyment. Such information, when combined with satisfaction ratings of these same attributes (see Question 5), otherwise known as importance-performance ratings, can provide useful management insights.

5. SATISFACTION RATINGS OF AREA'S ATTRIBUTES (BEST PRACTICE QUESTION)

Thinking of your expectations before arriving at [INSERT NAME OF AREA], please consider whether each of the following attributes was better than you expected, about the same as you expected, or worse than you expected.

	Much worse than I expected	Worse than I expected	About the same as I expected	Better than I expected	Much better than I expected	No opinion
Interpretation/Information						
Maps and directional signage	1	2	3	4	5	6
Availability of pre-visit information	1	2	3	4	5	6
Information on plants and animals	1	2	3	4	5	6
Information on cultural heritage of area	1	2	3	4	5	6
Staff present or available	1	2	3	4	5	6
Environment/Experience						
Sightings of native wildlife	1	2	3	4	5	6
Numbers of other people in picnic areas	1	2	3	4	5	6
Numbers of other people on walking tracks	1	2	3	4	5	6
Behaviour of other visitors	1	2	3	4	5	6
Peace and quiet	1	2	3	4	5	6
Condition of natural environment	1	2	3	4	5	6
Facilities/Maintenance						
Variety of easy walking tracks	1	2	3	4	5	6
Opportunities for challenging walks	1	2	3	4	5	6
Amount of rubbish/litter	1	2	3	4	5	6
Condition of walking tracks	1	2	3	4	5	6
Drinking water supply	1	2	3	4	5	6
Cleanliness of toilets	1	2	3	4	5	6
Condition of roads	1	2	3	4	5	6

Source: Archer and Griffin (2002)

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APPENDICES

APPENDIX I

PROBABILITY AND NONPROBABILITY SAMPLING METHODS

Probability Sampling Methods

Simple random sampling

The first step in simple random sampling is to obtain a list of eligible units that make up the population. In simple random sampling every unit has an equal chance of being selected from the sample frame. Units of the target population are selected one at a time and independently. Once they have been selected, they are not eligible for a second chance. Because of this equality of opportunity, random samples are considered relatively unbiased. One typical method of selecting a simple random sample is to use a table of random numbers. Suppose a random number table (found in practically all statistical books) is used to select 30 days (or sampling units) over the winter period (June 1 to August 31). The three-month period (or 92 days) is the sample frame. A number is assigned to each day of the sample frame. Using a table of random numbers, 30 days are selected from the 92 days. The days with the corresponding numbers are then included in the sample.

Systematic sampling

Systematic sampling is a sampling method that involves systematically spreading the sample through the population. For example, suppose you have the names of 3000 campers from which a sample of 500 is to be selected. Dividing 3000 by 500 yields a sampling interval of 1/6. That means that 1 in every 6 visitors will be in the sample. To systematically sample from the list, a random start is needed. To obtain this a dice can be tossed. Suppose the toss comes up with the number 5. This means that the 5th name on the list is selected first, then the 11th, 17th, 23rd and so on until 500 names are selected. If the number required for a random start is higher than 6, a random number may be generated using a computer.

Systematic sampling should not be used if periodicity is a natural component of the sample frame. That is, a certain type of person may occur at regular intervals within the sampling frame. If the sampling fraction is such that it matches the interval, the sample will include only certain types of people and systematically exclude others. For example, a list of married couples' names may be arranged so that every husband's name is followed by his wife's name. If a sampling fraction of four (1/4) was used (or any even number in this case) the sample would be of all the same gender (see Figure 10).

1	2	3	4	5	6	7	8	9	10	11	12	13	14
H	W	H	W	**H**	W	H	W	**H**	W	H	W	**H**	W

NB. Random start at 1, Sampling interval ¼, Bold cases are selected, H=husband, W=wife

Figure 10 The effect of periodicity in systematic sampling

Stratified random sampling

A stratified sample is obtained by dividing the population into subgroups or "strata", and a random sample is then selected from each subgroup. Each stratum must be mutually exclusive. Stratification is only useful when the variation within strata is less than the variation between strata. For example, if campground visitation varies between week day and weekend use, a more accurate and potentially more

useful estimate of use can be obtained by stratifying the population to be sampled into Monday to Thursday, and Friday to Sunday. The two strata are then treated for random sampling as described above.

Cluster sampling

A cluster sample is a simple random sample in which each sampling unit is a collection, or cluster, of observations. Unlike stratified sampling, in which every stratum is sampled, cluster sampling involves visiting a subset of clusters. Cluster sampling is generally used when it is either impossible or impractical to construct an exhaustive list of the units comprising the population. For example, if the objective is to estimate total visitor use on walking tracks in an area, and there are a number of track heads with several tracks leaving each, the count is focused on track heads and not on each track.

If only some track heads can be counted then criteria is needed for selection (e.g. a ranking of track heads from popular to seldom used). Samples can then be taken in proportion to visitation levels. In doing this it is important that the clusters used are homogeneous. If the clusters are not homogeneous, there is the possibility that the sample may not be representative of the population as a whole.

Nonprobability Sampling Methods

Convenience sampling

To obtain information quickly and inexpensively, a convenience sample can be employed. A convenience sample consists of a group of individuals that is ready and available. In other words, the data collector simply chooses the most convenient sampling unit. For example, to estimate use at dispersed campsites, the number of visitors using these campsites is recorded whenever the data collector is in the area. There is no statistical randomness to the sample. Furthermore, it cannot be determined how close the sample estimates are to actual use of the dispersed area. Visitors at picnic areas, visitor centres, or campgrounds may not be representative of all visitors to the area. A convenience sample is often used for pre-testing a method of data collection.

Quota sampling

Quota sampling is the nonprobability sampling equivalent of stratified sampling, with the added requirement that each stratum is represented in the sample in the same proportion as in the population. For example, the sample period may be stratified so that the number of weekdays and weekend days are in proportion. Using quota sampling, the number of weekdays and weekend days would be proportionately sampled (*eg.* the ratio of 5:2) until the quota of sample days was filled.

Purposive sampling

In purposive sampling, researchers use their own judgement about which sampling unit to choose from, and select only those that best meet the purpose of the study. Purposive sampling is useful when probability sampling methods are either unfeasible or prohibitively expensive. If the sample size is to be very small in proportion to the population, a purposive sample will be more reliable and representative than a probability sample.

Snowball sampling

A snowball sample is a form of purposive sampling that is appropriate when it is necessary to reach small, specialised populations. This type of sampling relies on previously identified members of a group to identify other members of the population. In the first stage, people with the desired characteristics are identified and interviewed. These people are then asked to identify other people who have these same characteristics. As newly identified members name others, the sample snowballs.

APPENDIX II

KONDALILLA NATIONAL PARK VISITOR SURVEY

THE UNIVERSITY OF QUEENSLAND

Queensland Government
Queensland Parks and Wildlife Service

KONDALILLA NATIONAL PARK VISITOR SURVEY

Dear Visitor,

The Queensland Parks and Wildlife Service (QPWS) and the University of Queensland are undertaking visitor surveys at Kondalilla National Park to better understand the characteristics, attitudes, and preferences of visitors. The questions asked in the survey relate to this visit only. The information collected from the surveys will be used to improve the management of, and services provided, at Kondalilla National Park.

It is important that only one person from each group complete the questionnaire. The questionnaire is strictly confidential and should take about 10 to 15 minutes of your time.

Please complete the questionnaire just before you leave the park and place in the self-addressed, reply-paid envelope provided (no postage stamp required) and return to us by mail.

1. Including this visit, how many times have you visited Kondalilla National Park? *(Tick one box only)*

- ☐1 Once, this is my first time → GO ON TO QUESTION 3
- ☐2 2 to 4 times
- ☐3 5 to 10 times
- ☐4 More than 10 times

2. If you have visited Kondalilla National Park more than once, when approximately was the last time? *(Tick one box only)*

- ☐1 Less than 1 month ago
- ☐2 Less than 1 year ago
- ☐3 Between 1 year and 5 years ago
- ☐4 More than 5 years ago

3. How long was your visit to Kondalilla National Park? *(Tick one box only)*

- ☐1 Half day (1-4hours)
- ☐2 Full day (4-8 hours)

4. **Are you visiting Kondalilla National Park with a commercial tour group?** *(Tick one box only)*

☐1 Yes

☐2 No

5. **Which of the following sources of information did you use when deciding to visit Kondalilla National Park?** *(Tick all that apply)*

☐1 Received no information prior to visit

☐2 Previous visit(s)/ prior personal knowledge

☐3 Word of mouth

☐4 Tourist information centre

☐5 Travel guide/book

☐6 Television/radio programs

☐7 Telephone or written inquiry to park

☐8 Newspaper/magazine article

☐9 Qld Parks & Wildlife Service brochure

☐10 Qld Parks & Wildlife Service website

☐11 Other website

☐12 Road sign/map

☐13 Motoring organisation (eg. RACQ)

☐14 Other (please specify) _____

6. **How important was each of the following statements to you as a reason for visiting Kondalilla National Park?** *(Circle a number for each statement)*

No	Statement	Not at all important		Moderately important		Extremely important
1	To rest and relax	1	2	3	4	5
2	To socialise with family/friends	1	2	3	4	5
3	To learn about the park	1	2	3	4	5
4	To learn about the cultural history of the area	1	2	3	4	5
5	To experience a natural environment	1	2	3	4	5
6	To escape everyday routines	1	2	3	4	5
7	To be physically active	1	2	3	4	5
8	Other _____	1	2	3	4	5

Of the reasons listed above, please circle the number of the statement corresponding to your <u>primary reason(s)</u> for visiting Kondalilla National Park in the left column.

7. Please tick which sites you have visited at Kondalilla National Park, and the amount of time you have spent at each site.

		Hours
☐1	Picnic Area	_____
☐2	Picnic Creek	_____
☐3	Picnic Creek Circuit	_____
☐4	Kondalilla Falls	_____
☐5	Kondalilla Falls Circuit	_____
☐6	Other _____	_____

8. Which activities have you participated in during this visit to Kondalilla National Park? *(Tick all that apply)*

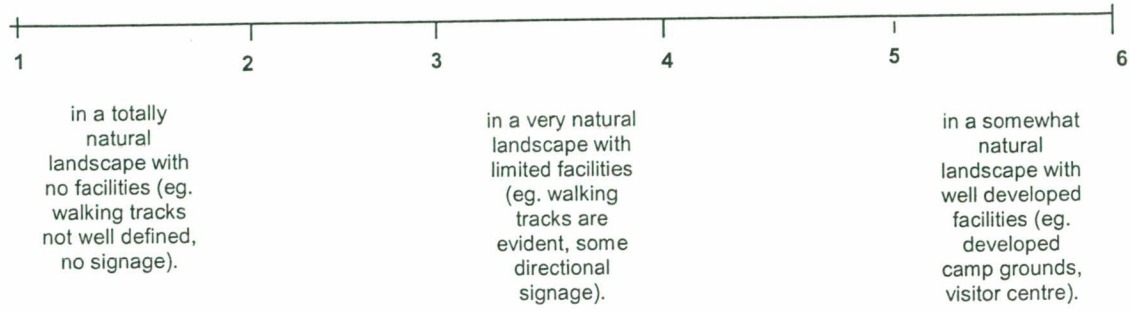
☐2	Short walk (less than 2 hours)	☐138	Commercial (not QPWS) tour
☐3	Medium walk (2-4 hours)	☐78	Nature study/viewing
☐77	Picnic/ barbeque	☐86	Photography
☐100	Swimming	☐144	Other _____

9. Please indicate your level of satisfaction with each of the following facilities and services provided at Kondalilla National Park. *(Circle a number for each attribute)*

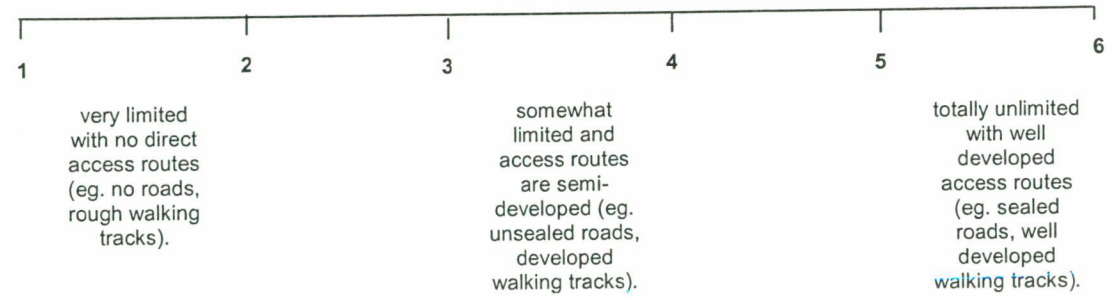
	Very dissatisfied	Dissatisfied	Neither satisfied or dissatisfied	Satisfied	Very satisfied
Queensland Parks & Wildlife Service staff (eg. availability, attitude, presence)	1	2	3	4	5
Maintenance of sites within the park (eg. cleanliness, presentation)	1	2	3	4	5
Design of sites within the park (eg. location, safety, layout)	1	2	3	4	5
Access to sites within the park (eg. provision, number of sites)	1	2	3	4	5
Maintenance and upkeep of park facilities (eg. cleanliness, presentation)	1	2	3	4	5
Design of park facilities (eg. location, safety, size, practicality, appropriateness)	1	2	3	4	5
Management of visitors in the park (eg. noise, crowding, behaviour of others)	1	2	3	4	5

10. **The park service would like to know your preferences for certain 'experiences' when visiting national parks. For each of the following, please <u>circle</u> the number that best matches your <u>personal preference</u>.**

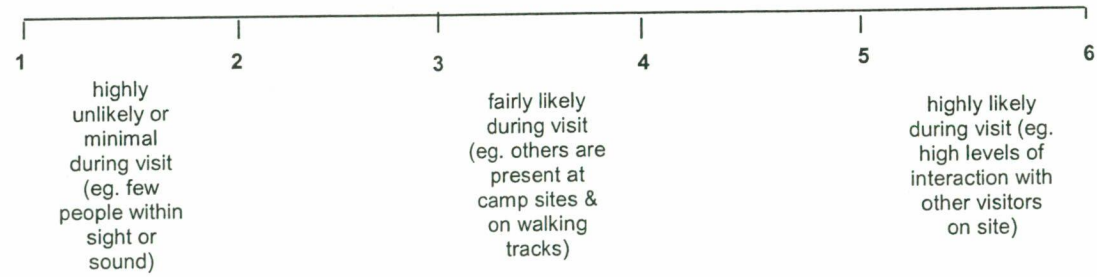
My preferred national park experience is...



I prefer to visit national parks where access is...



I prefer to visit national parks where meeting others is...



11. The park service is interested in your evaluation of interpretation provided at Kondalilla National Park. How do you rate each of the following sources of information or interpretation?

	Good	Fair	Poor	Not aware existed	Aware existed but did not use
Park brochure	☐1	☐2	☐3	☐4	☐5
Park map	☐1	☐2	☐3	☐4	☐5
Park notice board/whiteboard	☐1	☐2	☐3	☐4	☐5
Assistance from park staff	☐1	☐2	☐3	☐4	☐5
Self-guided walk signs	☐1	☐2	☐3	☐4	☐5
Other _____	☐1	☐2	☐3	☐4	☐5

12. Thinking about your overall experience, what did you <u>like most</u> about your visit to Kondalilla National Park?

_____

_____

_____

13. Thinking about your overall experience, what did you <u>like least</u> about your visit to Kondalilla National Park?

_____

_____

_____

14. Reflecting on your visit, how well do you think Kondalilla National Park is being managed? *(Tick one box only)*

☐1	☐2	☐3	☐4	☐5	☐6
Very well	Well	Average	Poorly	Very Poorly	Don't know

15. In what ways do you think the National Park is being managed well?

_____

_____

_____

_____

16. In what ways do you think the management of the National Park could be improved?

_____

_____

_____

The following set of questions are about you and your travel group.

17. What is your age? *(Tick one box)*

☐1	☐2	☐3	☐4	☐5	☐6
18 - 24	25 - 34	35 - 44	45-54	55 - 64	65 or older

18. Including yourself, how many people were in your personal group? _____

19. Within your personal travel group, how many were adults and how many were children?

Number of adults _____

Number of children _____

20. Where do you live? Australia (postcode) _____

Overseas (country) _____

21. Are there any additional comments you would like to make about your visit to Kondalilla National Park?

_____

_____

_____

22. Do you have any comments that will help us improve our questionnaire? Your feedback is important and appreciated.

_____

_____

_____

Thank you for your time and cooperation. Please place the questionnaire in the self-addressed, reply-paid envelope (no postage stamp required) and mail back to us.

_____

APPENDIX III

INTERVIEW-ADMINISTERED INTERVIEW FORM

INTERVIEW-ADMINISTERED INTERVIEW FORM

DATE: ____/____/____ INTERVIEWER: _____ NATURAL AREA: _____ SAMPLING SITES: _____

Hello, my name is [INSERT NAME]. I am doing some visitor surveys for the [INSERT NAME OF NATURAL AREA AGENCY]. The agency is interested in your visit and what you think of the services and facilities provided in the [INSERT TYPE OF NATURAL AREA]. The information collected will be used to improve the management of, and services provided at, [INSERT NAME OF NATURAL AREA]. The survey will take about ten minutes, and the information collected is treated as confidential. Could you spare 10 to 15 minutes of your time to tell me about your visit to [INSERT NAME OF NATURAL AREA]?

1) How many people are in your immediate family group?
2) How old are you?
3) Note gender of respondent

IF NO: Thank you. **IF YES**: Which one of the adults would like to be interviewed for the group?

CONTACT #	REFUSE	ACCEPT	GROUP SIZE	AGE	GENDER

INTERVIEW-ADMINISTERED INTERVIEW FORM (Cont'd)

CONTACT #	REFUSE	ACCEPT	GROUP SIZE	AGE	GENDER

APPENDIX IV

SELF-ADMINISTERED INTERVIEW FORM

SELF-ADMINISTERED INTERVIEW FORM

DATE: ____/____/____ INTERVIEWER: _____ NATURAL AREA: _____ SAMPLING SITES: _____

Hello, my name is [INSERT NAME]. I am doing some visitor surveys for the [INSERT NAME OF NATURAL AREA AGENCY]. The agency is interested in your visit and what you think of the services and facilities provided in the [INSERT TYPE OF NATURAL AREA]. The information collected will be used to improve the management of, and services provided at, [INSERT NAME OF NATURAL AREA]. The survey will take about ten minutes, and the information collected is treated as confidential. Would you like to take a survey with you that can be filled in at the end of your visit?

IF NO: Thank you. **IF YES**: Which one of the adults would like to be interviewed for the group?

1) How many people are in your immediate family group?
2) How old are you?
3) Note gender of respondent
4) So we can remind you to mail back the questionnaire, do you mind if we get your name and postal address. If we have not received your survey within two weeks, a reminder letter and replacement survey will be mailed to you.

CONTACT #	REFUSED	ACCEPTED	ID#	NAME	POSTAL ADDRESS	GROUP SIZE	AGE	GENDER	MAILED BACK

SELF-ADMINISTERED INTERVIEW FORM (Cont'd)

CONTACT #	REFUSED	ACCEPTED	ID#	NAME	POSTAL ADDRESS	GROUP SIZE	AGE	GENDER	MAILED BACK

APPENDIX V

QUESTIONNAIRE RESPONSE RATE FORM

QUESTIONNAIRE RESPONSE RATE FORM

NATURAL AREA: _____ NUMBER OF SURVEYS DISTRIBUTED: _____

DATES OF SURVEY PERIOD: FROM ____/____/____ TO ____/____/____

DAY AND DATE OF FIRST DAY AFTER SURVEY PERIOD: _____, ____/____/____

No. of Days	Date Received (Dd/Mm/Yy)	No. of Questionnaires Received	Cumulative Questionnaire Tally	Response Rate (Cumulative %)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				

QUESTIONNAIRE RESPONSE RATE FORM (CONTINUED)

No. of Days	Date Received (Dd/Mm/Yy)	No. of Questionnaires Received	Cumulative Questionnaire Tally	Response Rate (Cumulative %)
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				

APPENDIX VI

REMINDER LETTER TEMPLATE

REMINDER LETTER TEMPLATE

[Day], [Month], [Year]

[Name of respondent]
[Street address]
[Town], [State], [Postcode]

Dear [Name of respondent],

I would like to thank you for agreeing to participate in the visitor surveys a couple of weeks ago at the [INSERT NAME OF AREA] for the [INSERT NAME OF AGENCY]. Our records indicate that we have not yet received a copy of your survey in the mail.

The purpose of this follow-up letter is to remind people who have not yet mailed back their survey responses that your comments and opinions are important to the [INSERT NAME OF AREA AGENCY]. I have included a copy of the survey and a self-addressed reply-paid envelope in case you have misplaced your original copy.

I hope you enjoyed your visit to the [INSERT NAME OF AREA].

I look forward to hearing from you.

Kind regards,

[Name of researcher]

GLOSSARY

Closed-response questions	Questions that ask the respondent to choose from a pre-determined list of responses.
Cluster sampling	A probability sampling method where a random sample of subgroups is selected, with members of each selected subgroup sub-sampled afterwards.
Convenience sampling	A nonprobability sampling method that attempts to obtain a sample of convenient sampling elements.
Data cleaning	Thorough and extensive checks for consistency and treatment of missing responses.
Data coding	The assignment of a code, usually a number, to the various responses to a question.
Data editing	A process of reviewing completed questionnaires to identify omissions, ambiguities and errors in responses with the objective of increasing accuracy and precision.
Descriptive statistics	A class of statistics that is used to summarise the characteristics of a sample.
Element	The object about which or from whom the information is desired. In survey research, the element is usually the respondent.
Ethics	The process of evaluating and addressing whether a particular action is right or wrong, good or bad.
Frequency distribution	A mathematical distribution whose objective is to obtain a count of the number of responses associated with different values and to express these counts in percentage terms.
Histogram	A vertical bar chart in which the height of the bars represents the relative or cumulative frequency of occurrence of a specific variable.
Inferential statistics	A class of statistics that enables the researcher to estimate whether sample results are likely to hold in the population.
Interval scale	A scale in which numerically equal distances represent equal values in the characteristic being measured.
Likert scale	A measurement scale whose response categories require the respondent to indicate a degree of agreement or disagreement with each of a series of statements.
Nominal scale	A scale whose numbers serve only as labels or tags for identifying and classifying objects with a strict one-to-one correspondence between the numbers and the objects.
Nonprobability sampling	Any sampling method where the probability of the inclusion of any element of the population is unknown. Some units of the population have a greater chance of selection than others.
Open-response questions	Questions that have either no classification of responses, or pre-coded classification of responses. Respondents must create their own answers and state them in their own words.
Ordinal scale	A measurement that assigns only a rank order (i.e. "less than or greater than") to a set of objects.

Person entry	Occurs whenever a person enters an area for any purpose.
Person visit	Occurs when a person visits an area for the first time on any given day or on the first day of the stay for the purpose of participating in related activities.
Person visit-day	Occurs when a person stays in an area for a day or part day, each day the person stays counts as an additional person-visit-day.
Person visit-hour	Used for visits to areas where the person cannot stay overnight but where different lengths of stay, ranging from minutes to hours, can be significant to management.
Population	The aggregate of all the elements that share some common set of characteristics.
Probability sampling	Any sampling method where the probability of the inclusion of any element of the population is known and is greater than zero.
Purposive sampling	A nonprobability sampling method that uses the researcher's judgment to identify which sampling unit best meets the purpose of the study.
Qualitative research	An unstructured, exploratory research methodology based on small samples intended to provide insight and understanding of the problem setting.
Quantitative research	A research methodology that seeks to quantify the data and, typically, applies some form of statistical analysis.
Quota sampling	A nonprobability sampling method in which quotas are established for population subgroups.
Rank order scale	A measurement scale where respondents are presented with several objects simultaneously and asked to order or rank them according to some criterion.
Ratio scale	A measurement scale that has a true or meaningful zero point, allowing for the specification of absolute magnitudes of objects.
Research objectives	A specification of what the project should measure.
Research questions	Refined statements of the specific components of the research problem.
Response rate	The percentage of the total attempted surveys that are completed.
Sample	A subgroup of the population selected for inclusion in the research.
Sampling frame	The complete list of all possible sampling units in the target population from which the sample is drawn.
Sampling unit	The basic unit that is available for selection at some stage of the sampling process.
Semantic differential scale	A measurement scale in which the respondent is asked to rate each attitude object in turn on a five- or seven-point rating scale bounded at each end by bipolar (or opposite) adjectives.
Simple random sampling	A probability sampling method in which each population member has an equal chance of being selected.
Snowball sampling	A nonprobability sampling method in which each respondent is asked to identify one or more other sample members.

Stratified random sampling — A probability sampling method that uses natural strata or subgroups that are more homogeneous than the total population. Elements are selected from each strata using a random procedure.

Systematic sampling — A probability sampling method in which the sample is chosen by selecting a random starting point and then selecting every *k*th element in succession from the sampling frame.

Target population — The collection of elements or objects that possesses the information sought by the researcher and about which inferences are to be made.

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Note: Page numbers in bold indicate a table, in italics a figure; "n" after a page number indicates a footnote.