RECLAMATION

Managing Water in the West

Estimating Future Recreation Demand: A Decision Guide for the Practitioner

U.S. Department of the Interior
Bureau of Reclamation

January 2007

Estimating Future Recreation Demand: A Decision Guide for the Practitioner

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Acronyms

APA	Administrative Procedures Act
BLM	Bureau of Land Management
Demand Guide	Estimating Future Recreation Demand: A Decision Guide for the Practitioner
NEPA	National Environmental Policy Act
NSRE	National Survey on Recreation and the Environment
Reclamation	Bureau of Reclamation
ROS	Recreation Opportunity Spectrum
SCORP	Statewide Comprehensive Outdoor Recreation Plan
Task Force	2002 Federal Interagency Task Force on Visitor Capacity on Public Lands and Waters
USFS	U.S. Forest Service
WROS	Water Recreation Opportunity Spectrum

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Why are decisions difficult?

London, England ***September 19, 1772***

Dear Sir,

In the affair of so much importance to you, wherein you ask my advice, I cannot, for want of sufficient premises, advise you what to determine, but if you please I will tell you how. When those difficult cases occur, they are difficult chiefly because while we have them under consideration, all the reasons pro and con are not present to the mind at the same time, but sometimes one set present themselves, and at other times another, the first being out of sight. Hence the various purposes or inclinations that alternatively prevail, and the uncertainty that perplexes us. . .

Benjamin Franklin

Mr. Franklin recognized that decisions are often hard because of our mental organization. Thus, this Demand Guide provides a structured thinking process to help ensure that the recreation practitioner will duly consider all information and, subsequently, make better and more defensible decisions about future recreation demand.

SECTION I

Introduction

SECTION I
Introduction

Five factors motivated the Bureau of Reclamation (Reclamation) to develop this Demand Guide for estimating future recreation demand.

1. The concept and practice of measuring recreation demand has been confusing and often overlooked. Many recreation-related plans are devoid of recreation demand information, or the demand information is too shallow to be useful. Frequently, the data collection tools and measurements are not consistent from one effort to another, making comparisons and linkages to build upon impossible. There is also confusion about what purpose demand information serves, how to integrate it into a planning process, and whether estimating demand requires a special, complex, and expensive scientific study.

2. Recreation planning is becoming more complex and contentious. This situation will only increase in the future. The recreating public continues to grow in number and diversity as new technologies and choices of how to enjoy the outdoors expand. Conversely, recreation management budgets are limited and are in competition with the increasing demand for non-recreational goods and services from the public estate.

3. Public recreation planning and management requires basic recreation resource allocation decisions. No public agency has the time or money to do all it would like to do, nor can agencies provide for everything that the public desires. Budgets, personnel, programs, facilities, and public lands and waters need to be allocated to certain recreation opportunities. Difficult recreation allocation decisions need to be made, and certainly some decisions will be judicially challenged.

4. Predicting any human endeavor is tenuous, given unforeseen events and considerable uncertainty. There are no right, absolute, or correct predictions. There are no formulas, databases, or scientific studies that, alone, are sufficient. There are many factors that need to be considered at the same time. Dealing with this level of uncertainty and complexity is uncomfortable for most practitioners.

5. The development of the Water Recreation Opportunity Spectrum (WROS) system in 2004 provided recreation practitioners with a means to inventory the supply of recreation opportunities. Whereas WROS provides the supply-side analysis, this Demand Guide is helpful to supplement and fully implement the WROS system by addressing the demand-side analysis. (***Note***: The value and utility of this Demand Guide does not require the application of WROS.)

Purpose and Structure of the Demand Guide

The purpose of this Demand Guide is to help practitioners assess recreation demand in their routine administration and planning processes and to help decisionmakers make better and more defensible decisions.

The estimation of recreation demand is a decision based upon sound professional judgment and due consideration of many information sources and factors. As pointed out by Mr. Franklin, many decisions are difficult because of the human tendency to be very selective and narrow at any point in time about what information is considered. The field of decision science has determined that humans need analytical structure and tools to best deal with complex decisions.

Thus, this Demand Guide is a question-based tool to help practitioners assemble and analyze important available information. It provides a structured thinking process and a means to be mentally organized. It also provides examples of how to display and record important information so that it is:

1. Effectively considered during decisionmaking
2. Retrievable and useful for future planning and visitor monitoring efforts
3. Included in the administrative record as judicial evidence that the decision was reasonable, logical, reasoned, and trackable

The utilization of this Decision Guide is intended for situations in which Reclamation managers are faced with a decision of consequence that may have a significant environmental, social, or economic effect on local communities and the recreating public. Examples of when this Demand Guide would be useful include resource management planning and environmental impact analyses; situations in which there are proposed land or water use changes, overcrowding and public safety concerns, major proposed facility development, or capital investments; and in situations when Reclamation's recreation managing partners are preparing recreation management plans, applying WROS, or preparing recreation business plans for concession operations. This Demand Guide also recognizes that the appropriate level of analysis will vary based upon a sliding scale of demand analysis discussed in section II.

This Demand Guide is modeled after the U.S. Forest Service's (USFS) Decision Protocol 2.0 (U.S. Department of Agriculture Ecosystem Management, 1999) and is built upon the field of decision science, principles of recreation planning, and the judicial doctrine of reasonableness and due diligence.

Section I provides the development criteria and definitions of the key concepts and terms. Section II presents the underlying logic and strategy for estimating demand. Section III provides the details for a recreation demand assessment. Section IV illustrates how demand estimates can be integrated into a planning process and linked to recreation supply and visitor capacity information.

Demand Guide Development Criteria

Management concepts and tools evolve over time with new science, information, and experience. Recent examples of evolving concepts and tools include the WROS system, visitor capacity, ecosystem management, collaborative planning, and adaptive management. The concept of recreation demand is also evolving and can be viewed from different perspectives. Thus, for the purpose of preparing this Demand Guide, several criteria were used to frame its structure and content.

Links to Existing Processes

Estimating recreation demand is not a separate, isolated activity which, by itself, prescribes the right course of action for a decisionmaker. On the contrary, recreation demand estimates are one piece of input into a larger planning process.

By linking recreation demand estimates to other processes and planning information (e.g., recreation supply and visitor capacity), additional value-added information can be gained. Figure 1 displays the important linkages that were helpful in developing this Demand Guide.

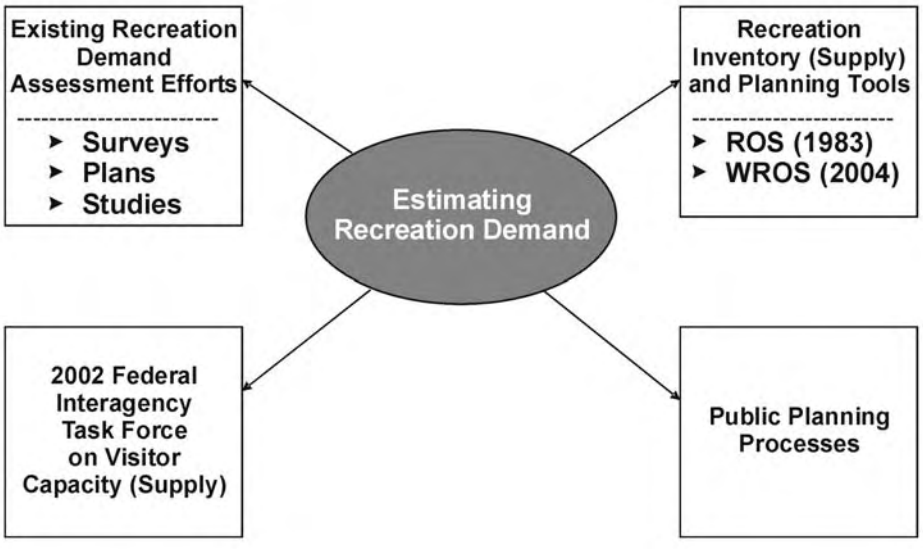


Figure 1.—Links to existing processes.

Practical and Useable by the Field Practitioner

This Demand Guide was developed primarily for the ease and practical application of the field practitioner. The content provides a useful level of detail, but not so much detail as to burden the practitioner or to be a scientific or academic treatise on the topic of recreation demand. The target audiences for this Demand Guide include recreation planners, resource managers, park superintendents, refuge managers, river and trail managers, landscape architects, facility and site designers, interpretive planners, economists, budget and policy analysts, community planners, and recreation business operators.

This Demand Guide also acknowledges that planners can spend too much or too little time and effort to estimate recreation demand. Metaphorically, one does not need to purchase an expensive car to cross the street. It is possible for planners to overemphasize the importance of demand estimates in the overall process of making a decision. While this Demand Guide focuses solely on estimating recreation demand, demand estimates are only one of many factors that must be considered in a public planning process.

Encourages Interagency Perspective

The issue of recreation demand is not a unique or an occasional question facing one agency. Rather, it is an omnipresent and an ongoing question challenging all local, State, Federal, and private recreation providers. Arguably, one of the greatest barriers to demand estimation has been the narrow parochial perspective of many professionals to not look beyond their own agency for information and collaboration. This Demand Guide encourages an interagency and collaborative perspective to gather and analyze existing information.

Integrates with any Public Planning Process

This Demand Guide was developed by Reclamation with the intent that its guidance would be useful to any practitioners concerned with outdoor recreation. Each agency and organization has developed its own planning process and types of planning documents. This Demand Guide does not recommend or offer a new planning process. Rather, this Demand Guide views the estimation of recreation demand as an input into the inventory step of whatever planning process is being used. A discussion of a generic public planning process and each planning step is provided later in this Demand Guide (see figure 5).

Integrates Legal Doctrine

Increasingly, recreation resource decisions are being challenged through appeal and litigation (e.g., decisions related to visitor capacity and facility development). Thus, it is increasingly important for recreation planners, managers, and decisionmakers to be legally sufficient and compliant with key environmental legislation such as the National Environmental Policy Act (NEPA) and the Administrative Procedures Act (APA). This Demand Guide integrates important legal doctrine and considerations such as sound professional judgment, preponderance of the evidence, sliding scale rule of analysis, and the judicial rule of reasonableness.

Links to Measuring Recreation Supply

The primary tools for measuring recreation supply are the Recreation Opportunity Spectrum (ROS) developed in 1983 by the USFS and the WROS developed in 2004 by Reclamation. These tools enable recreation planners and managers to inventory the current supply of recreation opportunities. This Demand Guide links with these tools by providing additional guidance on how to estimate recreation demand concurrent with measuring recreation supply. Several sections of the WROS User's Guidebook are reprinted in this Demand Guide to ensure the desired linkage.

Builds an Administrative Record

As previously stated, agencies do not have the resources to provide recreation opportunities for all people on every acre and every day. Difficult recreation resource allocation decisions are becoming the norm. Such allocation decisions will provide recreation opportunities for some people and not others, and therein lies the basis for legal challenge.

The APA established that "arbitrary and capricious" decisions by Federal officials are illegal; that is, legally sufficient decisions must be principled and reasoned. The act also instructs the court to review the whole record in order to judge whether a decision is arbitrary and capricious. Thus, when legal action begins, the courts request the administrative record as the evidence that it will use to pass judgment.

It is vital that the practitioner maintains an organized paper trail and file (i.e., the administrative record). This Demand Guide helps to make more defensible decisions by providing a set of professional principles for estimating demand, guidance on how to make estimation decisions, and examples of tables and forms that can serve as evidence of being logical, reasoned, and trackable.

Focuses on the Field Level

Figure 2 shows that the scope and scale of estimating recreation demand can vary in perspective: national, multi-State regions of the Nation, States, counties, and other subregions of States, local communities, sites, and projects. As previously stated, this Demand Guide is a tool for the field practitioner and, thus, focuses on estimating demand at the local or site level, as depicted in the shaded portions of figure 2.

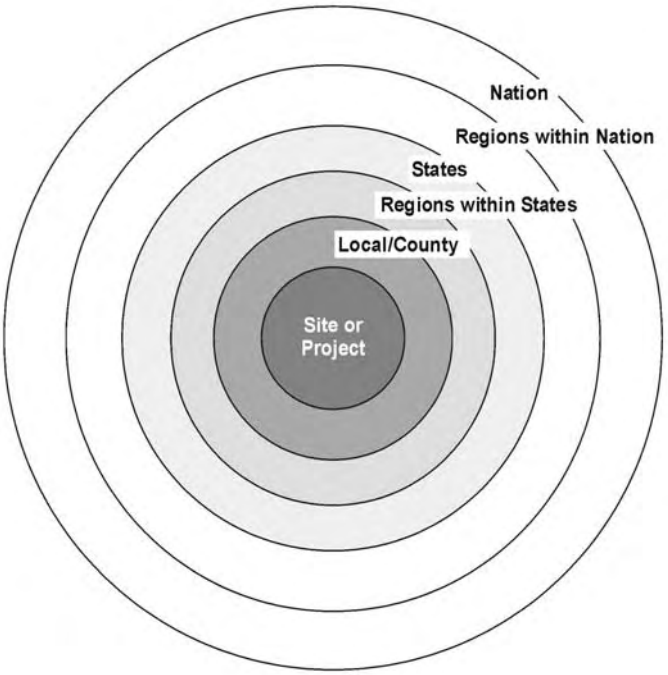


Figure 2.—Alternative geographic scales of estimating future recreation demand.

Examples of locations where this Demand Guide would be particularly useful include:

- Lakes, rivers, and reservoirs
- Watersheds and basins
- Special designations such as national recreation areas, heritage corridors, wilderness, and Wild and Scenic Rivers
- Visitor centers, campgrounds, marinas, resorts, and ski areas
- Regions such as the Cascades, Four Corners, Black Hills, and California's Central Valley

Key Concepts and Terms

A major reason why the concept and practice of measuring recreation demand has been so illusive is the lack of standard terminology and definitions. This section is very important to the practitioner because it provides the perspective and definitions that are the basis of this Demand Guide.

Recreation Demand

Recreation demand is the *estimated number* of *people* who are projected to participate in a particular *recreation opportunity* at some predetermined *future time* and location. Several terms are highlighted in italics because they need further elaboration or provide choices for the practitioner.

Practitioners do not *estimate* demand with 100 percent certainty. Rather, the estimate is supported by a preponderance of the information considered and may be more appropriately represented by a numeric range. For example, rather than indicating that demand will increase 27 percent in the next 10 years, it would be more helpful to offer a low- and high-bound range such as 25 to 30 percent. Furthermore, estimates with one or two decimal points are not recommended because they provide an unrealistic sense of certainty.

The estimated *number of people* is typically expressed as a number or numeric range of individuals or groups (e.g., 10,000 visitors, 120 to 150 groups). The number of people can also be expressed as a percentage of the population in the market area or as a percentage increase or decrease in participation from some baseline year (e.g., year 2005). Another option is that the estimated number of people refers to some attribute of the visitors such as vehicles, motorized recreation vehicles, motorboats, horseback groups, boat launches, snowmobiles, campers versus day-use groups, or local versus non-local parties.

Historically, recreation demand has focused on the visitor's primary recreation activity (i.e., hiking, fishing, boating, camping, or skiing). Today, the recreation profession recognizes that not all hiking, boating, or fishing is the same because of the diverse outdoor settings where the activity may be enjoyed. Estimating demand for just activities may be too vague and misleading. Thus, the recreation profession has developed the concept of a *recreation opportunity* that goes beyond the activity perspective. The term "recreation opportunity" is defined in the next section.

The *future time* period, or future demand target year, is the target time period for which demand is being estimated. It is typically 5, 10, 15, or 20 years into the future. This Demand Guide utilizes a 10-year future time period. Beyond 20 years is considered very tenuous. Furthermore, the future time period can focus on the full calendar year; a portion of the year, such as the summer or hunting season; or even a shorter time in the case of a special event.

Recreation Opportunity

Four decades ago, recreation was viewed principally as an activity, such as boating or skiing. However, in the 1970s, recreation science determined that recreationists are motivated by seeking a particular type of recreation experience and that a recreation activity is a means to this end. It also determined that the condition of the resources and how the recreation setting is managed can influence the kind of experience a person is likely to have. In the 1990s, recreation science further determined that recreation experiences lead to benefits for individuals, families, and communities and provide benefits to the economy and the environment.

Today, it is professionally accepted that recreation managers provide *recreation opportunities.* That is, managers provide opportunities for visitors to participate in a type of recreation activity in a specific setting to realize a particular type of experience and subsequent benefits. Figure 3 depicts the key components of a recreation opportunity and how they are linked to one another.

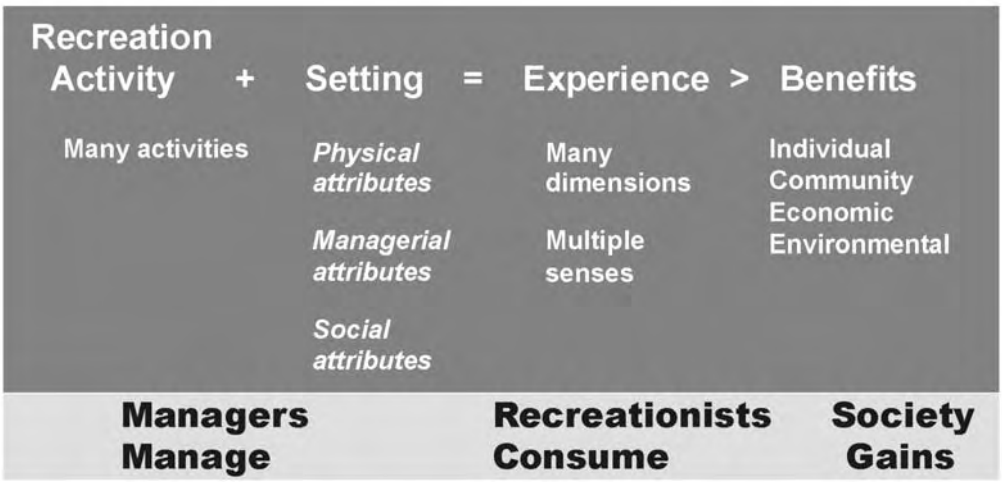


Figure 3.—A recreation opportunity.

In a perfect world, it would be helpful to estimate future demand for activities, settings, experiences, and benefits. The recreation profession needs to move in this direction. In the meantime, it is important to move beyond simply measuring demand for an activity because that level of information may be too vague and misleading.

This Demand Guide recommends that demand be estimated for the key "activities and settings." For example, rather than estimating demand for simply canoeing, it is recommended that demand be estimated for canoeing in a suburban setting or canoeing in a rural natural setting. This Demand Guide will henceforth use the phrase key "recreation opportunity" to mean a key "recreation activity in a particular setting."

Furthermore, this Demand Guide recommends the use of the settings prescribed in the ROS or WROS systems. Figure 4 displays the six recreation settings used in the WROS system (see WROS User's Guidebook, 2004, for detailed descriptions of these settings). A less desirable option, but still an improvement over using simply recreation activities, would be to use the setting descriptors such as backcountry versus front country or developed versus natural setting.

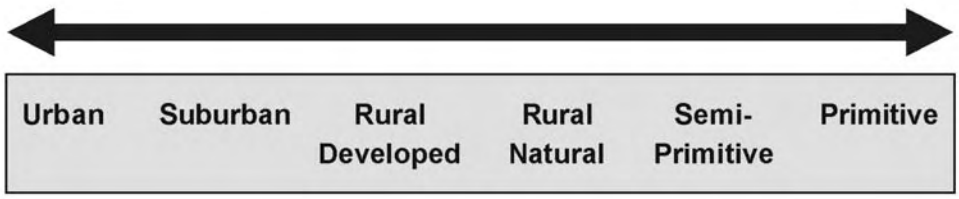


Figure 4.—A spectrum of recreation opportunities.

Demand Assessment

Demand assessment requires conducting an information search, compiling important information, consulting with others, performing analyses, and developing reasonable estimates of the future recreation demand for the key recreation opportunities in question. The demand assessment culminates in an estimate (i.e., a number or numeric range of people) of demand for each of the key recreation opportunities under consideration. These estimates, along with the demand estimates for other relevant goods and services such as water, power, timber, wildlife habitat, grazing, minerals, and cultural resources, serve as input to the inventory stage of a planning process.

Information Atmosphere

Recreation practitioners have access to much information that is useful and may be sufficient to estimate future recreation demand. Unfortunately, recreation professionals often fail to perform the critical step of looking beyond their agency or area of management jurisdiction. In this Demand Guide, the phrase *information atmosphere* represents the assemblage of data, studies, plans, community surveys, reports, and other information available from the private, non-profit, and public sectors at the local, regional, and national level. Table 1 depicts a potential information atmosphere. By considering each cell in the matrix, practitioners can be more diligent in their information searches.

Table 1.—The information atmosphere for estimating recreation demand

	Public sector	Private sector	Non-profit sector
Federal	National Survey on Recreation and the Environment (USFS) National Visitor Use Monitoring data (USFS) U.S. Army Corps of Engineers visitation data U.S. Fish and Wildlife Service 5-year hunting and fishing survey Federal Energy Regulatory Commission re-licensing studies Environmental impact statements General management and resource management plans Federal research publications and Web sites Special departmental or congressional reports or commissions (e.g., Government Accountability Office, Congressional Research Service) Agency visitor monitoring reports	Corporate market research studies Corporate annual reports (e.g., REI, Winnebago, Bass) Private consultant reports Recreation, tourism, and leisure textbooks	National Recreation and Parks Association Outdoor Industry of America Recreation Roundtable Annual Reports American Camping Association Special reports of recreation industry association Conference proceedings Travel Industry Association Gallup, Roper, Pew, and other national polls
State	Statewide Comprehensive Outdoor Recreation Plans Statewide public surveys Census reports Economic profiles Demographic profiles State tourism reports and data Sales tax generations University research studies Agency visitor monitoring reports	Resort visitation Travel industry visitation reports Private consultant reports Private college reports and studies State park concessionaire reports and studies	State Tourism Boards State recreation and tourism associations State chapters of national recreation organizations Conference proceedings
Local	County and parks, recreation, and open space plans County economic development plans County road counts County tax records Agency visitor monitoring reports	Resort visitation Concessionaire records Sporting goods sales Hotel and restaurant records Outdoor recreation service provider records	Chambers of Commerce Local friends or special interest groups Cooperating organizations

Planning and Market Area

This Demand Guide uses the phrase *planning area* to refer to the geographic location for which the practitioner wants to estimate demand. It may be a site such as a campground or marina, a lake or park, watershed, or a larger region of a State. The *market area* is the geographic area where the visitors to the planning area reside; that is, the area where people live who visit the planning area. A reasonable rule of thumb is to define the market area as the geographic area where at least 75 percent of the visitors reside. For example, the market area might be a 10-mile radius for Chatfield Lake State Park near Denver, an 80 mile radius for Folsom Lake State Park near Sacramento, and a 250 mile radius for Lake Mead, Nevada/Arizona.

Demand by Whom

The number of "current on-site" visitors is the expression of demand that is the easiest to measure and the most commonly reported. Typically, recreation practitioners will express recreation demand as the number of on-site visitors in a day, season, or year. For example, the recreation demand to Colorado's Boreas Pass in 2005 was 114,700 on-site visitors.

Current on-site visitation is certainly a major component of estimating future recreation demand, but it alone is not sufficient. The amount of "unmet" public demand at a site is more difficult to measure and a less visible type of recreation demand. Unmet recreation demand can be defined as the number of people who would visit a recreation site, but for various reasons, do not. These people need to be considered in estimating future recreation demand. Table 2 provides a taxonomy of people who will influence future recreation demand.

Table 2.—A taxonomy of people who will influence future recreation demand

Current on-site demand	Current recreationists who visit the area; may be referred to as visitors, users, guests, customers, audiences, tourists, participants, or consumers.
Unmet demand	*Displaced.* People who previously used the site or facilities but have been displaced or no longer visit the site because of some undesirable attribute, condition, or situation (e.g., overdevelopment, lack of maintenance, infusion of new/different user group, water quality).
	Disenfranchised. People who are aware of the site or facilities but for some reason do not feel welcomed, comfortable, or are unable to visit (e.g., income, disability).
	Latent. People who desire, are able, and are planning to visit the recreation site or facilities but who have not done so to date.
	New. People who may be new residents or otherwise are not currently aware of the available recreation opportunities or who are existing residents with changing outdoor recreation interests and are likely to participate as they become more aware.
	Tourists. People who live outside your market area but will travel to the area for a short period of time (e.g., vacation, business trip).

Planning Process

Public resource planning is the process used to make allocation decisions for our public lands and waters. At the Federal level, NEPA provides the regulatory foundation for environmental planning. Most States have adopted a similar approach to NEPA since Federal and State programs and budgets are intertwined.

Although each agency and organization may have a slightly different planning process (e.g., terminology, review periods), the steps of a rational public planning process are basically the same. Figure 5 shows the steps of a generic public planning model. In many resource management plans and environmental analyses, recreation is considered an important management concern, public issue, or opportunity. Thus, figure 5 also shows that the output of a recreation demand assessment can enter into the inventory stage of the process and then is considered in the subsequent steps. (*Note*: Section IV of this Demand Guide elaborates on how a recreation demand assessment can be useful in each step of the planning process while Reclamation's Resource Management Plan Guidebook (2003) explains Reclamation's planning process and its linkage to NEPA.)

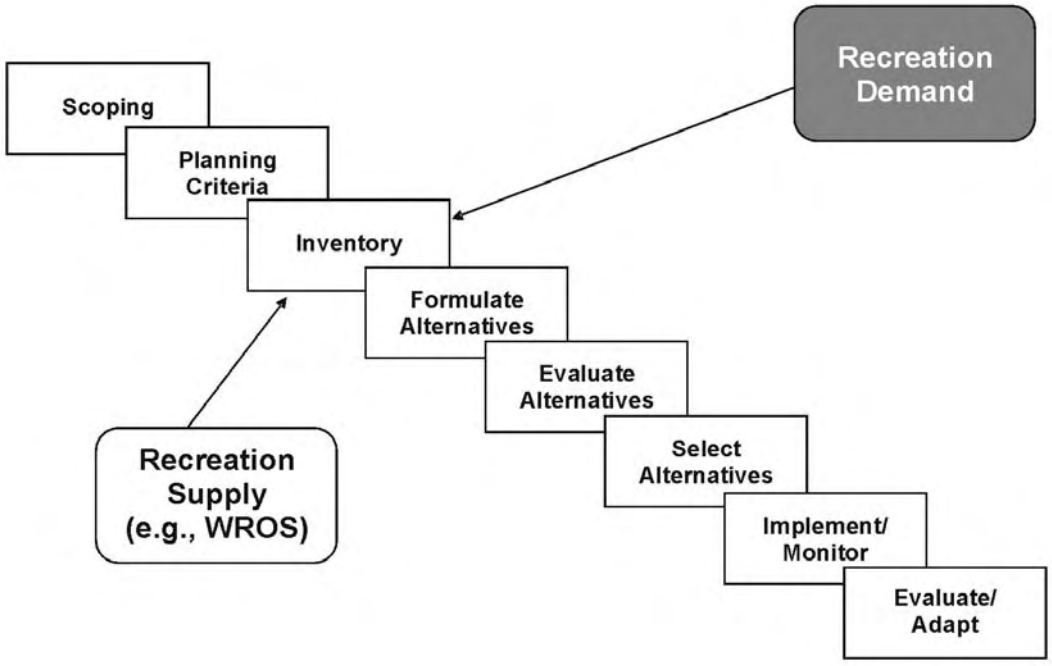


Figure 5.—Integration of recreation demand to a general planning process.

SECTION II

Foundation for Estimating Demand

SECTION II
Foundation for Estimating Demand

The resulting decisions from estimating recreation demand can have significant consequences to budgets, personnel, local residents, outdoor recreationists, communities, businesses, the economy, and the environment. Professionals are legally and morally obligated to make decisions that are reasonable, reasoned, logical, and transparent. Thus, it is important that the professional has a solid philosophical underpinning and rationale for decisionmaking. This section provides the underlying foundation for estimating future recreation demand.

The Standards for Estimating Recreation Demand

The substantive standard for demand estimation is that the decision be based upon sound professional judgment, which is defined later in this section.

The procedural standard for demand estimation is that a rational public planning process be used to arrive at demand estimates. In most planning instances, the procedural guidance from NEPA and the Council of Environmental Quality regulations provide the overall planning framework and direction. Furthermore, each agency has tailored the NEPA guidance to its own needs and perspectives to create similar but unique planning processes, terminology, sequencing, and other varying features. Estimating recreation demand does not require a special planning process. Rather, it is one decision and input among many that is made as part of an existing agency's planning process.

Key Principles for Estimating Recreation Demand

The APA sets forth the legal standard that decisions must be principled and reasoned; that is, arbitrary decisions violate Federal law. Professional principles help meet this responsibility by clarifying institutional values, philosophy, and perspectives. Principles serve as a guide and rule of thumb for making decisions and they help stakeholders understand and meaningfully participate in a planning process.

Below are 10 principles that reflect important and central values for estimating recreation demand. Full and deliberate consideration of these principles will contribute to logical, reasoned, transparent, and defensible estimates of recreation demand.

1. The purposes of estimating recreation demand are to (a) help ensure that public agencies supply the recreation opportunities desired by the public; (b) ensure that opportunities are appropriate given the agency mission and resources; (c) encourage coordination and collaboration among the many public, private, and non-governmental providers of recreation opportunities; and to (d) help conserve recreation diversity and a spectrum of diverse recreation opportunities for the public.

2. Recreation demand is the estimated number of people who are projected to participate in a particular recreation opportunity at some predetermined future time and location. Demand may also be expressed as the estimated percent of increase or decrease for a particular recreation opportunity from some baseline year.

3. Consideration of recreation demand should include the current visitors and the unmet public demand that may exist.

4. The public has a demand for recreation opportunities; that is, a demand the public has for recreation activities, settings, experiences, and benefits.

5. Recreation demand assessment needs to consider the market area or "visitation range" where the majority of the current and potential visitors are likely to reside. In some cases, the visitation range or market area may be relatively small (e.g., within 75 miles), while in other cases, the range or market area may be much larger.

6. The recreation practitioner is responsible for making a "reasonable estimate" of future recreation demand based upon sound professional judgment. There is no right, absolute, or certain prediction of recreation demand. There is no single formula, database, or study that, alone, is sufficient for estimating recreation demand. Estimating recreation demand requires thoughtful consideration of many factors followed by a decision. This is no different from how economists make future economic forecasts based upon consideration of population growth, employment, mortgage rates, personal income, retail sales, housing permits, building contracts, and price indices.

7. Certainty cannot be achieved when projecting the future of any human endeavor because of unforeseen changes, circumstances, and random events. The time and effort to forecast the future should be reasonable and appropriate. Thus, a rule of thumb for estimating future recreation demand is to use the sliding scale rule of analysis; that is, the level of analysis (i.e., precision, certainty, time, effort, costs) should be commensurate with the potential consequence of the decisions under consideration.

8. Estimating future recreation demand will benefit from hindsight analysis and the identification of factors and circumstances that have affected recreation demand in the recent past.

9. The need to assess recreation demand is common among local, State, and Federal agencies; communities; tourism commissions; resorts and private businesses; economic development councils; special recreation interest groups; and others. Interagency collaboration to assess recreation demand is encouraged and can yield greater efficiencies, higher quality demand estimates, and greater defensibility of demand estimates.

10. Estimates of recreation demand will change over time given new science and information, recreation technology, social and economic trends, regional and national events, and other circumstances of importance. Ongoing visitor monitoring is paramount and will improve both the precision of estimates over time and enable practitioners to learn from past decisions.

Guidance for Recreation Demand Decisionmaking

After the analysis of the recreation demand information is complete, the recreation practitioner needs to make a decision; that is, the practitioner needs to develop a reasonable estimate of the recreation demand for the area in question. These decisions need to be carefully considered and can benefit from the field of decision science, judicial principles, and Federal law (e.g., NEPA, APA). The standard for recreation demand decisionmaking incorporates (1) sound professional judgment, (2) preponderance of the evidence, (3) a rule of reasonableness, and (4) a sliding scale rule of analysis. The following is excerpted from the WROS User's Guidebook (Reclamation, 2004, pp. 24-26; <www.usbr.gov/pmts/planning/wros/index.html>).

Sound professional judgment. Sound professional judgment is defined as a reasonable decision that has given full and fair consideration to the appropriate information, is based upon principled and reasoned analysis and the best available science and expertise, and complies with applicable laws.

The terms in the definition take advantage of judicial doctrine and legal terminology. ***A reasonable decision*** is one that is fit and appropriate under the circumstances. It is a decision that natural resource decisionmakers of ordinary prudence and competence would not view as excessive or immoderate under similar circumstances. It is important to remember that the judiciary does not compare a manager's decision against some single absolute right decision conceived by the court; that is, the court's function is not to make administrative decisions but rather to judge the reasonableness of an agency decision using such judicial doctrine as reasonable care, due diligence, and sufficient evidence. ***Full and fair consideration of the appropriate information*** is the condition of considering the whole situation and making a sound decision. ***Principled and reasoned analysis*** is the condition of not being arbitrary and capricious. Being arbitrary and capricious is one of the most frequent allegations in natural resource-related litigation. ***Best available science and expertise*** is the condition of using the best information and experience that is reasonably available to improve certainty. ***Complies with applicable laws*** is the expectation that a decisionmaker duly considers and is in conformance with relevant laws and regulations (e.g., NEPA).

Preponderance of the evidence. Preponderance of the evidence is defined as a condition whereby most of the information, data, trends, professional opinion, and other facts and circumstances of a situation support the reasonableness of a particular decision or course of action more than another decision or course of action. It is a situation where the weight of evidence of one course of action is greater than the weight of evidence of another course of action.

Rule of reasonableness. The rule of reasonableness is defined as a decision that professional recreation managers of ordinary prudence and competence would not view as excessive or immoderate under similar circumstances.

Sliding scale rule of analysis. This sliding scale rule states that the level of analysis used to estimate recreation demand should be commensurate with the potential consequences of the decision; that is, managers need flexibility to make decisions based upon a level of analysis that is commensurate with the purpose and potential consequences of the decision. For example, the greater the possibility that a decision may significantly alter natural or heritage resource conditions, local economies, or water operations, the greater the level analysis and deliberation. A sliding scale rule of analysis (see table 3) can range from modest to ordinary to extraordinary and can vary by the (1) level and type of information necessary, (2) tools and techniques used, (3) time and effort required, (4) level of certainty and risk, and (5) level of scientific input.

This Demand Guide recommends a three-level sliding scale of analysis for estimating recreation demand. This decision was made so that the demand assessment could parallel the three levels of analysis used in the WROS system to measure recreation supply and because it would parallel the judiciary's use of three levels of due diligence by a responsible official: (1) modest, (2) ordinary, and (3) extraordinary. Table 3 presents a sliding scale of analysis for estimating recreation demand.

Table 3.—A sliding scale of analysis for estimating future recreation demand

Level of analysis	Type and use of demand information	Level of detail and precision	Nature of the demand assessment
Level 1: **Coarse filter**	General administrative inventory; routine recreation management decisions such as facility closure or rehabilitation; visitor distribution efforts through information; maintenance and patrol scheduling; program planning.	Modest or low level of detail, intensity, effort, original data, time, and precision. Decisions are based upon the preponderance of the information and sound professional judgment.	Level 1 can be done by the local recreation staff who have experience and knowledge of the situation; can use available information with no original data collection or field inventory expected. Level 1 analysis can typically be completed in 1–2 person days.
Level 2: **Moderate filter**	Regional inventories and plans; interagency coordination; environmental assessments: analysis of impacts from small to moderate scale changes to facilities, land or water uses, visitation, recreation fees, or regulations.	Ordinary or moderate level of detail, intensity, effort, data, time, and precision. Decisions are based upon the preponderance of the information and sound professional judgment.	Level 2 can involve a small team of recreation experts; consultations with other agencies, communities, and private recreation businesses in the market area; may collect original data such as public meetings or focus groups. Level 2 analysis can typically be completed in 3–15 person days depending on the data collection method and sampling, if any.
Level 3: **Fine filter**	NEPA-compliant environmental impact statement planning; general management plans; resource management plans, interagency regional plans and Statewide Comprehensive Outdoor Recreation Plans; assessments of impacts from proposed moderate to large changes in facilities, land and water uses, visitation, or visitor regulations.	Extraordinary or high level of detail, intensity, effort, data, time, and precision. Decisions are based upon the preponderance of the information and sound professional judgment.	Level 3 can involve a team of recreation experts, preferably interagency representing the market area; consultations with other agencies, communities, and private recreation businesses in the market area; collect original data; survey visitors and sample of general public in the market area; Level 3 analysis can typically be completed in 45–120 person days, depending on the data collection method and sampling.

SECTION III

Steps for a Recreation Demand Assessment

SECTION III
Steps for a Recreation Demand Assessment

This section describes the steps for a recreation demand assessment. The output of a recreation demand assessment is demand estimates for the key recreation opportunities in question. These demand estimates may be used to make routine administrative decisions or serve as inputs to the inventory stage of a planning process. Figure 6 depicts the five steps of a recreation demand assessment and their linkages to the various steps of a public planning process.

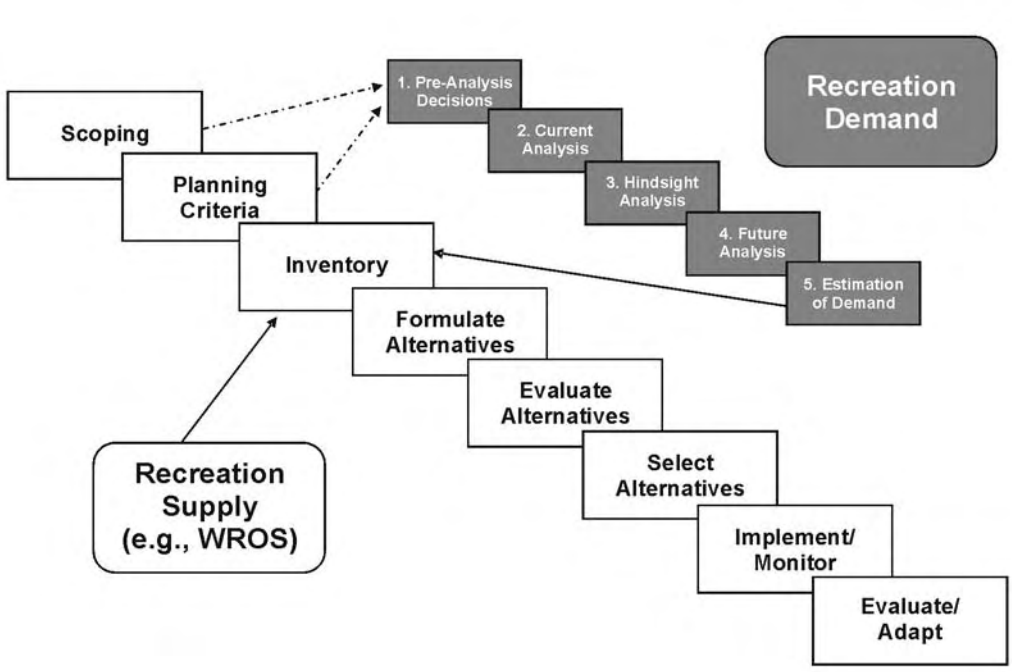


Figure 6.—Linkage of demand assessment to a general planning process.

As previously stated, this Demand Guide is a question-based tool to help ensure that the practitioners challenge themselves to assemble and analyze all available information. It provides a structured thinking process and a means to be mentally organized. It also provides examples of how to display and record important information so that it is (1) effectively considered in decisionmaking, (2) retrievable and useful for future planning and visitor monitoring efforts, and (3) included in the administrative record as judicial evidence that the decision was reasonable, logical, reasoned, and trackable.

Each of the five steps of demand assessment includes a series of questions. These questions, listed in this Demand Guide, are intended to serve as prompts or suggestions and are not absolute requirements for estimating demand. Practitioners should tailor and refine these questions to ensure relevance to the situation as well as to add questions deemed important.

In addressing the questions, there are two very important items to remember:

1. It is important to realize that not all the questions can be answered and that the level of certainty in answering the questions will range from zero to 100 percent. The practitioner's responsibility is to consider the best available information to make a reasonable decision.

2. It is not appropriate to eliminate a question simply because a practitioner does not know the answer. This action can invite allegations of being arbitrary and capricious. It is better, both legally and managerially, to disclose all important questions and be transparent in reporting when insufficient information is available. Furthermore, the demand assessment is not a one-time isolated event, but part of an ongoing learning process. Identification of questions with insufficient information to answer can be helpful to justify and design a visitor monitoring program.

Step 1: Pre-Analysis Decisions

The purpose of the pre-analysis step is to frame or to put sideboards on the demand assessment. There are a number of basic pre-assessment decisions that need to be made that are not special or unique to a recreation demand assessment. That is, many of these questions are fundamental to framing the overall planning process. Thus, these decisions may already be made as part of the scoping or planning criteria steps of the public planning process. The dashed lines in figure 6 connecting the scoping and planning criteria steps to the pre-assessment step are intended to depict this linkage.

The following questions should be considered, added to, or refined for your given situation. Underlines have been added to help clarify the central theme of each question.

- Why is the planning process or a recreation demand assessment being initiated? What is the nature and purpose of the planning process and what recreation decisions might be made based upon the demand assessment?

- What level of collaboration (e.g., shared data, interagency assessment) is intended with other recreation and tourism providers in the market area? Estimating future recreation demand is often important to the other local, State, and Federal recreation providers in the area as well as to the private tourism sector. There may be benefits for an interagency recreation demand assessment.

- What is the future demand target year to be used for the demand assessment (e.g., year 2020)? What is the baseline year in which to begin the current situation analysis? Will the demand assessment focus on recreation demand for the entire year or a portion (e.g., summer months, fishing season)?

- What is the planning area in which future recreation demand is being estimated (e.g., campground, State park, national forest, lake complex, basin, region of the State, special tourism district)?

- What subunits of the planning area should be considered separately in terms of estimating future recreation demand; that is, what are the ROS or WROS zones in the planning area or other areas of special importance that should be considered?

- What is the recreation market area where 75 percent or more of the visitors reside or originate from (e.g., 150 mile radius)?

- Is a substantially different geographic "market area" likely where future recreation demand may reside or originate?

- Who (e.g., agency and non-agency people) are the most knowledgeable people familiar with the current and historic recreation situation in the planning area? Who will be on the assessment team? Who will be the decisionmaker(s)?

- Is there approved agency direction (e.g., mission statement, management plans, policies, rules, and regulations) that identify particular recreation opportunities that are appropriate, compatible, and important to be considered in the assessment? Are there recreation opportunities that would not be considered appropriate or compatible with agency direction that should not be considered in this assessment?

- What are the key recreation opportunities for the planning area that will be the focus of the demand assessment? Criteria useful for selecting a reasonable number of key opportunities (less than 20) could include participation rates, traditional uses, special or unique opportunities, facility investments, anticipated future changes, public preference, and resource suitability and compatibility.

- Based upon the sliding scale of rule of analysis discussed in table 3, what level of analysis is considered adequate for this assessment; that is, what level of analysis is commensurate with the potential consequences of the decisions to be made based upon the demand assessment (i.e., Level 1 – modest, Level 2 – ordinary, or Level 3 – extraordinary)?

- How many staff days and dollars are anticipated for the demand assessment and over what period?

- Are there important assumptions, definitions, limitations, or other factors that should be considered and added to the administrative record?

- What resources are included in the information atmosphere for this demand assessment?

The output of the pre-analysis step is a record and understanding of the scale and scope of the remaining portion of the demand assessment. The information and decisions should be recorded as part of the administrative record and understood by those involved in the assessment. In the case of a Level 2 or Level 3 effort of analysis, where public participation and information is a major component, it would be helpful to proactively include much of this information in any public education newsletter, Web site bulletin, workshop, or open house.

Step 2: Current Situation Analysis

Figure 7 is a useful visual depiction for steps 2, 3, and 4. Step 2 helps the practitioner describe the current or baseline recreation situation. Step 3 helps to describe the past and how the current recreation situation got to where it is today. Step 4 describes how recreation demand may change or deviate in the future from the past or hindsight pattern.

The current situation analysis focuses on the baseline year, which would be the most recent full year from when the demand assessment is initiated. For example, if the planning process began in the spring of 2006, the current situation analysis year would be 2005.

In the case of a proposed facility or recreation area that does not currently exist, this analysis will depend on two or three comparables. Much like the real estate industry that uses comparables to value a residential property, recreation comparables can provide valuable insight and information for proposed facilities or existing ones. Useful criteria for selecting comparables would be similar geography, topography, vegetation, recreation opportunities, infrastructure and facilities, socioeconomic profile, and market area.

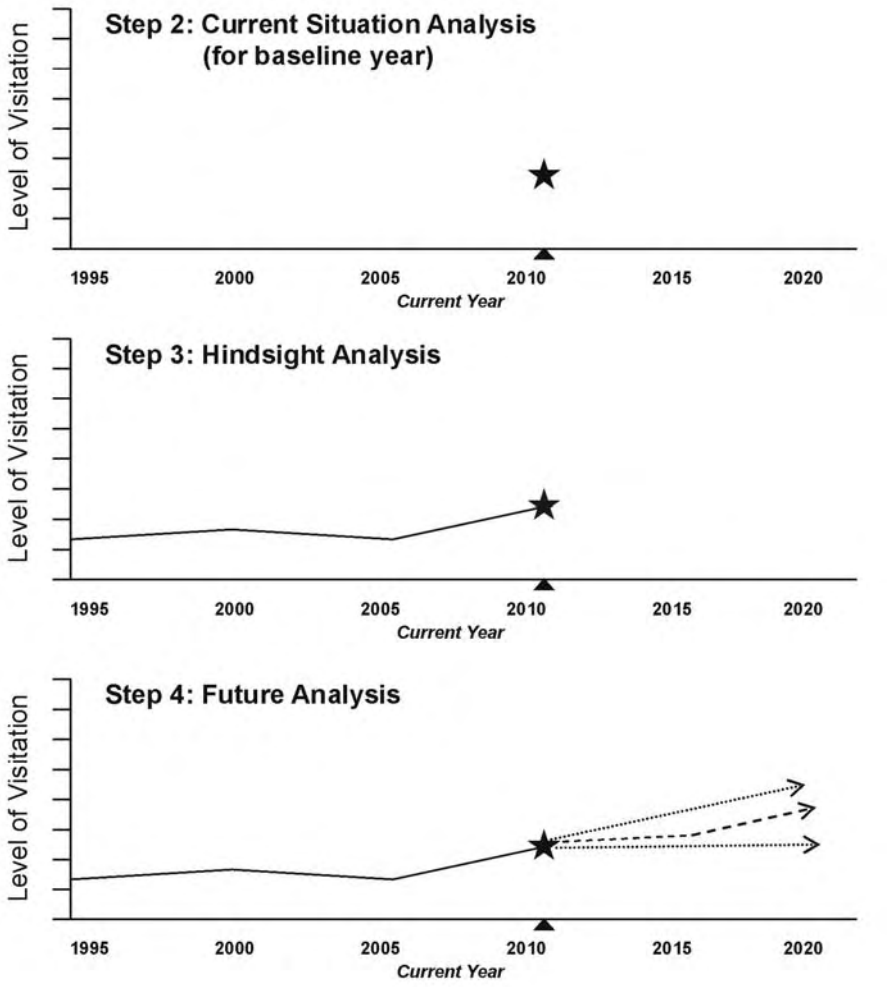


Figure 7.—Overall analysis strategy.

The following questions are offered as prompts for practitioners so that they may develop a full set of questions tailored to the situation at hand. Table 4 provides an example of how the important information from the current situation analysis can be summarized, displayed, recorded, and made useful for subsequent demand estimation decisions.

- What is the profile of the visitors to your planning area (e.g., age, ethnicity, gender, residence, origin of trip, family or group structure, education, income, first-time visitors)?

- What is the nature of visitation to your planning area (e.g., length of visit, time of day, weekend versus weekday, ingress and egress points, travel patterns, special points of interest or destinations, type of overnight accommodations, travel to other recreation sites while at the planning area, number of trips per year)?

Table 4.—An example summary table from a current situation analysis

Current year: 2005		**Desired sliding scale of analysis: Level 2**		
Planning area: Armistead Regional Park		**Market area: Within 100 miles**		
Key hindsight questions	Key summary of analysis	Level of importance[1]	Level of confidence	Level of adequacy
1. What was the 2005 visitation?	65,000 visitors in 2005; 80% of visitation in summer season	High	Moderate	Moderate
2. How many people participated in key recreation activities/ settings in 2005?	Fishing in rural natural = 20K Fishing in rural developed = 5K Day hiking in rural natural = 10K Camping in suburban = 40K Camping in rural natural = 3K Horseback Riding in rural natural = 5K Picnicking in rural developed = 10K Motorboating in rural developed = 15K	High	Low	Low
3. Quality of the 2005 park visitation?	No good data available; 32 law enforcement contacts; 9 emergency medicals; 14 complaints; anecdotal ranger reports large amount of repeat visitation	Moderate	Low	No
4. Any location where visitation (demand) is exceeding capacity (supply)?	Campground occupancy on summer weekends = 100% with suspected 15% turn-away; campground occupancy on weekdays = 50%; summer weekend boating = 100%; boat launch wait lines about 20 minutes on weekends; trailhead parking exceeds available spaces (illegal parking) = 100%	Moderate	Moderate	High
5. Quality of park resources in 2005?	No good data available; shoreline erosion from bank fishing unacceptable; water quality near boat launch below standard three of seven samples; two additional peregrine falcon nests on west shore	Moderate	Low	Low
6. Other information	First year of ethnic group requests for group picnic facility rentals (6); corporate special events (3); and reduced launch fee on M—TH in summer	High	High	High

[1] Level of importance refers to the importance to the assessment of the question and the answer; level of confidence refers to the degree of certainty of the answer; and level of adequacy refers to the adequacy or sufficiency of the available information relative to the desired level of analysis prescribed for the assessment.

A rating scale of no, low, moderate, and high is used for each of the three considerations.

- What is the estimated total number of people visiting the planning area in the baseline year or the time period within the baseline year of interest?

- What is the estimated total number of total people for each key recreation opportunity for the planning area and time in question (e.g., month, season, year)?

- What is the estimated total number of people to each ROS or WROS class, or other special management areas, under consideration?

- What is the quality of the recreation opportunities currently being provided to visitors in the planning area? Are there specific locations, times, activities, or situations where the visitor capacity is being threatened or exceeded?

- Is there an unmet demand (i.e., people in the market area that would like to visit the area but for some reason do not feel welcomed, are not financially or physically able, feel disenfranchised, no longer enjoy the area, or for some reason have been displaced)?

- What recreation equipment and vehicles are brought to the area (e.g., recreation campers, bicycles, boats and trailers, horses and trailers, generators, backpacks, off-road vehicles)?

- What is the average annual change in visitation at other comparable sites managed by other recreation providers in the market area (e.g., county and State parks, national parks, wildlife refuges, Reclamation reservoirs, Bureau of Land Management (BLM) special districts, private campgrounds)?

- Were there any significant changes or circumstances in the recreation situation in the last year that would affect future visitation?

- Were there any international events that might have an affect on tourism (e.g., fuel supply, weather, terrorism, military conflicts, dollar devaluation)?

The output of the current situation analysis is twofold. First, the current situation analysis provides a figure as a graphic representation of the current or baseline year. It provides the practitioner a "visitation" point, indicating the amount of visitation to the planning area. This point, step 2 in figure 7, becomes the anchor point for both hindsight and future analysis. Second, the current situation analysis provides a valuable narrative context and understanding of the answer to "Where are we today?" Table 4 provides an example of how this narrative context can be highlighted and summarized.

Step 3: Hindsight Assessment

Hindsight analysis examines the past through structured reflective examination of the events, trends, changes, and circumstances of the last 20 years. This step is intended to answer the question of "How did the current recreation situation get to where it is today?" Using the best available information and expertise from the market area, this step is intended to identify those factors that were the "influential drivers" over the last 5, 10, 15, or 20 years.

As previously stated, the following questions are offered as prompts for the practitioners so that they may develop a full set of questions tailored to the situation at hand. It is important to remember that, over the past 20 years, there have been changes such that the answers to the questions will vary. For example, visitation decreased 2 percent annually 10 to15 years ago, but it has increased 4 percent annually in the past 5 years. If information is available, it may be helpful, at least for some questions, to answer them with respect to shorter timeframes such as (1) the past 5 years, (2) 6 to10 years, and (3) 11 years and beyond.

- How have the visitors changed?
- What was the average annual population change in the market area?
- What has the average annual percentage change in visitation been over the last 5 years, 6 to 10 years, and 11 to 15 years?
- Are there any apparent reasons for the level of participation in the key recreation opportunities?
- What changes in recreation facilities, infrastructure, rules, regulations, programs, closures, maintenance, or public awareness have taken place that may have affected (i.e., increased or decreased) visitation?
- What changes have taken place among the comparable recreation opportunities managed by other agencies in the market area (e.g., new facilities, health and safety incidences, regulations, fees, road closures, declining maintenance, changes in land uses)?

- Are there recreation opportunities that were unique, or of special value to the public, that no longer exist today?

- What special values or meanings have been identified by the public as associated with the area?

- What changes or conditions in the natural, cultural, or historic resources may have affected visitation?

- What changes in the social, demographic, or economic characteristics of the market area may have affected recreation participation (e.g., population growth, immigration, age change, economic shifts, new industry, ethnicity)?

- What changes in transportation, marketing, land and water uses, new residential or commercial development, new special events, or promotions may have affected visitation?

- What other factors, human or natural events, conditions, or circumstances occurred in the last 15 to 20 years that may have affected visitation?

The output of hindsight analysis is twofold. First, hindsight analysis provides a figure as a graphic representation of the historic amount and pattern of visitation. It provides the practitioner with a past visitation trend line; that is, it depicts step 3 in figure 7. The line indicates the actual numeric (or percentage) change in visitation over the last 10 to 15 years, which can then be projected further based upon the historic trend to the future demand target year. Second, hindsight analysis provides a valuable narrative context and understanding to the question of "How did the current recreation situation get to where it is today?" Table 5 provides an example of how the important information from the hindsight analysis can be summarized, displayed, recorded, and made useful for the subsequent demand estimation decisions.

Table 5.—An example summary table from a hindsight analysis

Current year: 2005 **Hindsight timeframe: 2000 and 1995** **Desired sliding scale of analysis: Level 2** **Planning area: Armistead Regional Park** **Market area: Within 100 miles**				
Key hindsight questions	Key summary of analysis	Level of importance[1]	Level of confidence	Level of adequacy
1. Average annual percent of population change over last 10 years?	2% per year	High	High	High
2. Average annual change in park visitation from 1995–2000 and from 2000–2005?	1% per year from 1995–2000 3% per year from 2000–2005	High	Moderate	High
3. Major population shifts?	Affluent urban workers moving out of city 30 to 50 miles; 10 new subdivisions with 2,300 rooftops; tourism marketing has greatly expanded; agrian population being displaced	Moderate	Moderate	Moderate
4. Changes in recreation infrastructure?	Aging infrastructure; 40% of facilities over 20 years old; safety modifications to marina and boat launches	Moderate	High	High
5. What recreation management changes?	Facility management changed to private concessionaire; more services and marketing in the last 5 years	Low	Moderate	High
6. What transportation or changes in access?	Highway signs installed in 1996; two boat launch lanes repaved; hiking trail extended and connected to State trail system in 1994	Low	High	High
7. Given increase in ethnic diversity of population, will the diversity be apparent among those visiting?	No good data available; anecdotal reports that visitation would increase with more day-use large group facilities	High	Low	No

[1] Level of importance refers to the importance to the assessment of the question and the answer; level of confidence refers to the degree of certainty of the answer; and level of adequacy refers to the adequacy or sufficiency of the available information relative to the desired level of analysis prescribed for the assessment. A rating scale of no, low, moderate, and high is used for each of the three considerations.

Step 4: Future Analysis

Future analysis requires the deliberate examination and justification for why historic known patterns from hindsight analysis will or will not continue. It is a deliberate step of asking "How will past patterns change by the target demand year?" It is intended to help the practitioner to carefully consider what may be new or different in the near future that will cause the historic demand patterns to deviate (i.e., increase or decrease).

Step 4 in figure 7 depicts future analysis. The past visitation trend line in step 3 is extended on the same trajectory into the future (bold dashed line). Then, future analysis challenges the practitioner to identify reasons why the line might change from that trajectory.

Once again, the following questions are offered as prompts for the practitioner so that they may develop a full set of questions tailored to the situation at hand.

- What is the expected percentage change in the population within the market area by the future demand target year?

- What changes in the social, demographic, or economic characteristics of the market area are likely to affect visitation (e.g., population growth, migration, age change, economic shifts, new industry, and ethnicity)?

- What changes in recreation facilities, infrastructure, rules, regulations, programs closures, etc., are likely to affect visitation?

- Consider each of the key recreation opportunities separately and ask if there are compelling reasons to think that they will increase or decrease as compared to the historic visitation trend and, if so, how much?

- Are the ROS or WROS zones in the planning area likely to change in the next 5 to 10 years?

- What changes will likely take place at other comparable recreation sites within the market area managed by other agencies (e.g., new facilities, health and safety incidences, regulations, fees, road closures, declining maintenance, and changes in land uses)?

- Will the current unmet recreation demand be met in the future; that is, are there people who will likely visit in the future who currently do not feel welcomed, are not financially or physically able, no longer enjoy the area, or for some reason have been displaced?

- What changes or conditions in the natural, cultural, or historic resources are likely that may affect visitation?

- What changes in transportation, marketing, land and water uses, new residential or commercial development, new special events or promotions, etc., are likely that may affect visitation?

- What special values or meanings are likely to be identified by the public that may affect visitation?

- What other factors, human or natural events, conditions, or circumstances are likely in the next 5 to 10 years that may affect visitation?

The output of future analysis is twofold. First, future analysis provides a graphic representation of the projected overall future visitation. Depending on the extent of available information, future analysis may provide visitation projections for some or all of the key recreation opportunities. Second, future analysis provides a valuable narrative context and understanding to the question of "What will change from the past pattern and where will we be in the future demand target year?" Table 6 is an example of how the narrative context can be highlighted and summarized with a special emphasis on the influential driving factors that will likely change the historic visitation pattern in the future.

Table 6.—An example summary table from a future analysis

Current year: 2005	**Future target year: 2015**	**Desired sliding scale of analysis: Level 2**		
Planning area: Armistead Regional Park		**Market area: Within 100 miles**		
Key hindsight questions	Key summary of analysis	Level of importance[1]	Level of confidence	Level of adequacy
1. What is the projected annual population growth for the next 10 years?	2% per year has been reported by the State Department of Commerce	High	High	High
2. Major population changes?	Affluent urban workers moving out of city 30 to 50 miles; 15 new subdivisions with 3,200 rooftops; ethnic group population expected to increase 6% per year; agrian population will continue being displaced	High	Moderate	High
3. Major tourism shifts?	New lodging tax started in 2004 for the marketing of tourists and winter snowbirds to area; tourism marketing for region will be greatly expanded	Moderate	Moderate	Moderate
4. Changes in recreation infrastructure?	5% of camping and picnic facilities to be brought to full standard each of next 10 years; two large group picnic facilities open in 2007; commercial marina will not expand its operation	Moderate	High	High
5. What recreation management changes?	Private concessionaire will continue operation; Sheriff's Office will increase patrols and enforcement; local friends group will be created; 4% of lake will be changed to no-wake zone; 25 campsites in rural natural zone will be designated and allocated by reservation	Low	Moderate	High
6. What land use changes are expected?	County will likely zone a 2-mile buffer around the regional park as open space and limited residential; park ambiance will be protected	High	Low	High
7. What recreation program changes?	Reduced weekday fees and fee-holidays will continue; K-8 environmental education program being funded and targeting schools within 20 miles	High	Low	High
8. What transportation changes can be expected?	Gas prices will have an effect on visitation, but how is the question? Will people travel shorter distances but stay longer? Will people use their boats less often?	Moderate	Low	No

[1] Level of importance refers to the importance to the assessment of the question and the answer; level of confidence refers to the degree of certainty of the answer; and level of adequacy refers to the adequacy or sufficiency of the available information relative to the desired level of analysis prescribed for the assessment. A rating scale of no, low, moderate, and high is used for each of the three considerations.

Step 5: Estimation Decisions

At this point of a recreation demand assessment, the practitioner has completed an information search, compiled important information, consulted with others, and completed the current, hindsight, and future analyses. This section addresses (1) the adequacy of the best available information, (2) decisionmaking, and (3) validating reasonable estimates.

Adequacy of Best Available Information

The next consideration towards estimating demand is that of quality control. The practitioner is responsible for making reasonable decisions based upon the best available information. But, a word of caution: the "best available information" used in a recreation demand assessment must be adequate and reasonable.

Recall the rule of reasonableness and the sliding scale rule of analysis previously discussed. The practitioner needs to ask "Is the best available information used in this demand assessment adequate and reasonable given the potential decisions to be made?" Or, stated otherwise, is there a need to collect information beyond what is currently deemed best and available?

For example, imagine a situation where the best available information about the current situation is road counter data collected in a non-systematic fashion from counters with known technical problems. This information may be adequate for making some minor personnel (e.g., maintenance, law enforcement) decisions but not adequate for decisions of more consequence such as campground closures, road improvements, or development of new recreation facilities.

Table 7 is an example of a tool to help make the judgment on the adequacy of the best available information. Table 7 assembles information from the previous tables that summarized key results from the current, hindsight, and future analyses (i.e., tables 4, 5, and 6). It provides for easy summation and for narrative text to be included so that the decision can be evidenced to be reasoned, logical, and trackable.

In the case of a Level 1 analysis, consideration of the summary information (see table 7) by those involved in the demand assessment would likely be sufficient to answer the question of whether the best available information is adequate. In the case of a Level 2 and Level 3 analysis, it is advised to get review and input from an outside team of experts. A popular tool for this purpose is a charette, which is discussed later in this section.

Table 7.—An example of an overall summary for a recreation demand assessment

Current Year: 2005			**Future Target Year: 2015**	
Desired sliding sale of analysis: Level 2				
Planning Area: Armistead Regional Park			**Market Area: within 100 miles**	
Analysis	Overall level of importance	Overall level of confidence	Overall level of adequacy	Comments
Hindsight	Moderate	Moderate	High	Provides good insights
Current situation	Moderate	Low	Low	Need to improve visitor monitoring effort
Future	High	Moderate	Moderate	Changing energy prices and ethnicity in the market area are the big unknowns
Is the available information adequate to estimate the recreation demand for 2015?	Notations: Yes, given the intended Level 2 analysis and that both the county and regional tourism council will be conducting public surveys in 2007 in which additional data will not be collected. Furthermore, the State office has allocated additional monies for 2007 so Armistead can get a more accurate and more detailed count of the current visitation to Armistead for all key opportunities.			

In the event that the best available information is judged to be inadequate, additional data collection efforts are necessary to supplement and complement the analysis to date. Attachments A and B contain numerous information resources to help assist any additional information collection efforts. They also provide an overview of data collection tools and visitor sampling.

Estimating Recreation Demand

After what may be several days, weeks, or even months of collecting and analyzing information, the demand assessment culminates with the practitioner making a decision. It is unfortunate and frustrating to many people that there is no single "all knowing" specific information source, no formula, no database, or no scientific study that alone can "give the right answer to the practitioner." Dealing with uncertainty and complexity is often uncomfortable for many practitioners.

On the other hand, making complex decisions is not new in the recreation resource profession, and there is guidance available from the field of decision science and the judiciary. Several small steps and reminders may be helpful at this point of the Demand Guide.

1. Review Section II, Foundation for Estimating Demand. It would be helpful to review the principles for demand decisionmaking. Recall the judicial guidance that decisions should be based upon a preponderance of the information; that is, based upon the majority of the best available information. Remember, it is the practitioner's responsibility to make a reasonable decision that can be expressed as a numeric range and level of confidence.

2. Summarize the highpoints of the hindsight, current situation, and future analyses in a clear and concise format, preferably in tables and figures. Keep all the summary information on the table for due consideration by everyone on the team.

3. Start with the key recreation opportunities that have a higher amount and quality of information. Using a table such as table 8, insert the key recreation opportunities down the left columns. Discuss each opportunity as a team and ask yourselves "What are the likely reasons for the historic visitation trend line to deviate up (a projected increase in visitation) or down (a projected decrease in visitation)?" The team should agree on a reasonable range, level of confidence, and the notation explaining their logic and justification.

4. Be sure to disclose where information is lacking or where confidence in the information may be low. Provide enough detail to make your estimates trackable.

5. Keep the task of estimating demand in perspective. Practitioners can spend too much or too little time and effort on a recreation demand assessment. Be diligent but reasonable. Keep in mind that, while estimates of public demand for all goods and services are important in a planning process, no single demand estimate will drive decisionmaking.

6. There is no single template to display the output of a recreation demand assessment, but given all the effort that is put into the analysis, the output will be brief, concise, and focused on the most influential information. Tables 8 through 11 are examples of demand estimation summary tables.

Table 8.—A sample summary table for a recreation demand assessment

Key activities	Recreation setting	Estimated percentage change in annual participation in 2015 from 2005		Level of confidence	Special notations for the administrative record: Data from NSRE[1], 2005 SCORP,[2] 2002 County Open Space master plan, and 1999 KOA marketing plan were very helpful in these estimates
		Low-end (%)	High-end (%)		
Picnicking	Suburban	20%	25%	High	Increasing population growth, increasing development, and growing Hispanic population
	Rural developed	10%	15%	Moderate	Recent facility improvements, lighting, and improved concession operations and security
Horseback riding	Rural natural	5%	8%	Low	Growing number of ranchettes in region, creation of backcountry horse group, improving trails, three new horse trailheads
Camping	Rural natural	25%	30%	Moderate	Aging population, more motorized recreation tourists from up-State, increased percent of full hookups
	Semi-Primitive	-3%	8%	Moderate	Aging population, semi-primitive campers declining and changing to recreation opportunities with more comforts
Backpacking	Primitive	-2%	+2%	High	Local area becoming more of a day-use attraction, area receiving heavy use, backpackers being displaced

[1] National Survey on Recreation and the Environment.
[2] Statewide Comprehensive Outdoor Recreation Plans.

Table 9.—A sample template for displaying the projected visitation of a recreation demand assessment

Title: The estimated range of projected annual visitors for the year 2015 (projected in 2005)				
Key activities	**Recreation settings**	**Low range estimate of visitation**	**High range estimate of visitation**	**Level of confidence**
Picnicking	Suburban	14,000	18,000	High
	Rural developed	10,000	12,000	Low
	Rural natural	4,000	6,000	Low
Motorboating	Rural developed	25,000	35,000	Moderate
Fishing	Rural developed	20,000	25,000	Moderate
	Rural natural	25,000	30,000	High
	Semi-primitive	15,000	18,000	High
Backpacking	Semi-primitive	2,000	4,000	Moderate
	Primitive	8,000	10,000	Low

Notes:

Table 10.—A sample template for displaying the projected percent of the population from a recreation demand assessment

Title: The estimated percentage range of the population in the market area participating in key recreation opportunities in the year 2015 based upon a market area population of 1 million in 2015 (projected in 2005)			
Key recreation opportunities	**Low range estimate of population (%)**	**High range estimate of population (%)**	**Level of confidence**
Picnicking/suburban	14	18	High
Picnicking/rural developed	10	12	Low
Picnicking/rural natural	4	6	Low
Motorboating/rural developed	25	35	Moderate
Fishing/rural developed	20	25	Moderate
Fishing/rural natural	25	30	High
Fishing/semi-primitive	15	18	High
Backpacking/semi-primitive	2	4	Moderate
Backpacking/primitive	8	10	Low

Notes:

Table 11.—A sample template for displaying the projected percentage change in visitation from a recreation demand assessment

Title: The estimated percentage range of change in recreation participation for key recreation opportunities in the year 2015 from the base year of 2005			
Key recreation opportunities	**Low range estimate of population (%)**	**High range estimate of population (%)**	**Level of confidence**
Picnicking/suburban	20	25	High
Picnicking/rural developed	10	15	Low
Picnicking/rural natural	5	8	Low
Motorboating/rural developed	30	35	Moderate
Fishing/rural developed	20	25	Moderate
Fishing/rural natural	25	30	High
Fishing/semi-primitive	5	10	High
Backpacking/semi-primitive	-5	0	Moderate
Backpacking/primitive	0	3	Low

Notes:

Validating Reasonable Estimates

Once preliminary demand estimates have been established with supporting justification, a quality control step should be considered. In the case of a Level 1 analysis, a team approach to discuss, debate, and arrive at demand estimates is likely sufficient. In the case of a Level 2 or Level 3 analysis, it is advised to get external review of the preliminary demand estimates.

External review is an accepted quality control tool among all professions. It will help to improve the quality of the demand estimates and their justification, and external review can also help make the decisions more defensible.

Recall that the judicial rule of reasonableness is defined as a decision that professional recreation managers, of ordinary prudence and competence, would not view as excessive or immoderate under similar circumstances. Stated otherwise, if the demand assessment leads to subsequent agency actions that are opposed and litigated, the court will review the agency's administrative record for evidence that the decisionmakers have been reasonable and not arbitrary and capricious. An external review can provide evidence that a decision is reasonable.

The Federal Interagency Task Force of Visitor Capacity on Public Lands and Waters implemented by the U.S. Department of the Interior prescribed the use of a charette to help practitioners make complex and contentious visitor capacity decisions. A charette would also be very useful in a recreation demand assessment, both to improve the demand estimates and to provide evidence that the estimates are reasonable. The output of a charette is fourfold:

1. External reviews provide the practitioner with new perspectives and interpretations and the opportunity to learn from other experts with similar experiences.

2. The quality and justification of the demand estimates is strengthened.

3. The record of the charette (e.g., agenda, list of attendees, summary of answers to key questions) provides evidence in the administrative record that the decision was reasonable.

4. Valuable guidance and suggestions are compiled for designing a visitor monitoring program.

The following short discussion is excerpted from the Task Force report (page 32) and is tailored to a recreation demand assessment.

Recreation Demand Charette

A charette is a popular tool in the architecture and construction profession. The Task Force believes it might also be a useful tool in dealing with visitor capacity and **related management questions (emphasis added).**

A recreation demand charette is defined as an intensive, multi-day work session focused on a specific locale and involving experts with diverse perspectives for the purpose of developing an external expert-based recommendation of the area's recreation demand. A charette is not the same as a typical public workshop or open house, in that it involves experts from diverse perspectives who are neutral and have no personal or professional stake in the situation.

A charette convenes a group of experts who have special knowledge, training, skill, experience, or research background. It is important to have participants with diverse competencies and perspectives. Diversity, creativity, energy, and commitment to team problem-solving are fundamental qualities to a successful charette. The groups will vary in size from 5 to 15 participants depending on the situation.

The group is challenged to address a series of questions during a 1–3 day period in order to reach a majority recommendation for the decision-making authority. In the case of a demand estimation charette, there are a series of prerequisite questions and assumptions necessary prior to making a numeric capacity recommendation.

The group may be divided into smaller teams (4–6 people) that take a lead role on one dimension of the problem, or that work concurrently on the same problem. The teams work independently for a period of time; then, the full group reconvenes so each team can report out for full debate and dialogue.

Based upon existing information and knowledge at the administering unit (e.g., clear and substantive management objectives and desired future conditions), coupled with the intellect, experiences, and creativity of the invited external experts, the intensive work session is an iteration of discussion, debate, creating options, presentation, critique, presentation, and final recommendation.

Examples of demand estimation charette questions:

- Is the current situation analysis full, complete, reasoned, trackable, and reasonable?
- Is the hindsight analysis full, complete, reasoned, trackable, and reasonable?
- Is the future analysis full, complete, reasoned, trackable, and reasonable?
- Is the best available information used in this assessment adequate?
- Are the demand estimates reasonable and justified?
- What should be included in an effective visitor monitoring program?

The remaining step in a recreation demand assessment, with due consideration of the charette results, is to finalize the demand estimates in a clear and concise table for input into the planning process. All associated supporting material should be catalogued and filed as part of the administrative record.

SECTION IV

Using Recreation Demand Estimates

SECTION IV
Using Recreation Demand Estimates

In section I of this Demand Guide, it is disclosed that a recreation demand assessment is often confusing or overlooked because its utility is not apparent. Thus, section IV illustrates how demand estimates can be integrated into a planning process and linked to recreation supply and visitor capacity information.

Input to the Planning Process

Figure 5 depicts the steps of a general public planning process. This section elaborates on the planning steps in figure 5 and highlights in bold those activities and decisions related to a recreation demand assessment.

Scoping Stage

- Identify significant public issues, management concerns, constraints, and opportunities (both recreation and non-recreation).

- **Identify key stakeholder, agencies, and other organizations; determine the level of interagency collaboration and develop a plan of collaboration.**

- **Compile and assess the quality and quantity of your best available information, including scientific data and past monitoring information; complete the information atmosphere matrix in table 1 of this Demand Guide.**

- Identify what **key recreation activities and settings will be the focus of the recreation demand assessment**. Criteria useful for selecting a reasonable number (less than 20) of key activity and setting combinations could include the participation rates, traditional uses, special or unique opportunities, facility investments, anticipated future changes, public preference, and resource suitability and compatibility.

Planning Criteria Stage

- Assemble important local, State, and Federal laws, regulations, policies, resource commitments, concession contracts, maps, and plans.

- Establish operating principles (e.g., recreation management, ecosystem management, NEPA, and visitor capacity decisionmaking).

- **Determine the planning area, recreation market area, planning horizon (e.g., 10 years), available resources, demand assessment team members, desired level of analysis, procedural steps, and responsibilities.**

- Select the decision criteria to be used to evaluate alternatives and to select the preferred alternative.

- Identify other administrative units or projects that have similar recreation situations, uses, and patterns (i.e., comparables or analogs).

Inventory Stage

- Inventory of natural and cultural resources (i.e., types, locations, conditions, uniqueness).

- Inventory of current management infrastructure, services, programs, personnel, budget, partners, and expected changes (both recreation and non-recreation).

- **Develop demand estimates** for important goods and services (e.g., timber, water, power, grazing, minerals, **recreation**, wildlife, and aesthetics).

- **Inventory the current supply of recreation opportunities and map locations (e.g., WROS inventory), description of users, current visitor capacity and occupancy rates for popular locations, and quality of experience.**

- Inventory of **regional recreation demand and supply, social and population trends, and recreation opportunities provided by other agencies and the private sector within the market area.**

Formulate a Reasonable Range of Alternatives

- Develop management prescriptions with a narrative description and objectives.
- Develop desired future conditions and standards for important resource, social, and managerial attributes.
- Apply management prescription(s) to all or part of the planning area (zoning).
- Select key management tools and actions, budget requirements, and expected levels of monitoring for each alternative.

Evaluate Alternatives (Assess Consequences of Each Alternative)

- Compare each alternative to the previously selected decision criteria.
- **Compare the type and level of recreation demand that will be met by each alternative; consider if recreation demand will exceed recreation capacity (supply of opportunities**).
- **Use recreation demand estimates to assess economic impacts of alternatives.**
- Solicit public preference input to help compare and strengthen management alternatives.
- Identify ways to mitigate negative consequences of management alternatives.

Select Preferred Alternative

- Select preferred management alternative based upon sound professional judgment.

Implement and Monitor

- Implement planned management prescriptions.
- **Implement the visitor monitoring program, including the measurement of the actual amount, type, and location of visitation, in order to gain feedback and improve recreation demand estimates.**

- **Identify locations where visitation (demand) is exceeding the supply of recreation opportunities; that is, where visitor capacity is threatened or being exceeded.**

- Monitor the quality indicators of the desired resource, social, and managerial conditions.

Evaluate and Adapt

- **Periodically evaluate monitoring data and new information, science, and circumstances; consider if recreation demand is approaching or exceeding the areas capacity (supply).**

- Make adaptations to management prescriptions based upon monitoring information and sound professional judgment.

Link to Recreation Supply and Visitor Capacity

The linkage of demand and supply is typically referred to as demand/supply analysis. It is the foundation of our Nation's market-driven economy. Demand/supply analysis is a basic tool to help manage the production and distribution of goods and services provided by private industry and the public sector. It is also a popular tool among the general public because of frequent exposure and relevancy to our everyday lives (e.g., gasoline prices, the housing market, restaurant reservations, hunting permits, hotel rooms, automobile rentals, stocks and bonds, reservoir operations, power grids, and construction materials). Demand/supply analysis is a powerful tool for the recreation practitioner.

Unfortunately, recreation demand/supply analysis is a tool that has been underutilized by the recreation profession for several reasons:

1. The metrics used to express recreation demand are often different than those used to express recreation supply. For example, demand is often expressed as the number of visitors or visitor days while supply is expressed as the number of camping sites, acres of WROS areas, or miles of trail. Metaphorically, it is difficult to compare apples to oranges.

2. Assessments of recreation demand and supply have typically focused on a large geographic area (e.g., State or Nation) and a long timeframe (e.g., a full year). While this information is useful, recreation practitioners have had difficulty in applying State and national information, as well as yearly information, to local situations. Recreation demand/supply analysis is more intuitive and useful when applied at the local or site level and to a short timeframe (i.e., overnight, daily, or at one point in time).

3. There is confusion about the terms recreation *supply* and visitor *capacity (or carrying capacity)*. There is also a titanic myth in recreation literature that a practitioner does not need to worry about visitor capacity for an area until there are unacceptable conditions or crowding and that the only purpose of a visitor capacity is to limit public access.

4. While there has been national direction on addressing recreation supply (e.g., ROS, WROS), there has been little national direction provided on the mechanics of recreation demand/supply analysis.

The following section of this Demand Guide addresses these limitations. First, a primer on understanding recreation supply and visitor capacity is provided to help clarify demand/supply analysis. Second, the mechanics for making a useful link between demand and supply information are described. Third, examples of summary tables are provided to illustrate how the results of demand/supply analysis can be conveyed and used to make and justify subsequent management decisions.

Primer on Recreation Supply and Visitor Capacity

The 2002 Federal Interagency Task Force of Visitors on Public Lands and Waters (Task Force) was initiated by the U.S. Department of the Interior as an output of the 1999 National Congress on Recreation and Resource Capacity. Participants in the Task Force were the BLM, U.S. Fish and Wildlife Service, USFS, National Park Service, and Reclamation. The Task Force report (available at <www.nrpa.org> or from glennehaas@comcast.net) provides useful clarification of the terms *recreation supply* and *visitor capacity*:

- *Recreation supply* is the prescribed number of appropriate recreation opportunities that will be accommodated in an area.

- *Visitor capacity* is the supply or prescribed number of appropriate recreation opportunities that will be accommodated in an area.

That is, the terms recreation supply and visitor capacity are synonymous and can be used interchangeably. The following excerpt from the Task Force report provides additional clarification.

Visitor Capacity on Public Lands and Waters: Making Better Decisions (Excerpted)

2. Task Force Perspectives: An Evolving Tool

Management concepts and tools evolve over time with new science, information, and experience. Recent examples of evolving tools include ecosystem management, collaborative planning, and adaptive management. Similarly, the concept of visitor capacity has and will continue to evolve. Section Two describes how the Task Force views visitor capacity and provides an important foundation for those new to the concept or unfamiliar with public land planning.

Task Force Perspectives

Definition of a Visitor Capacity. Visitor capacity is defined as the supply, or prescribed number, of appropriate visitor opportunities that will be accommodated in an area.

The Task Force adopted the phrase visitor capacity because of its clarity, its brevity, and the public's familiarity with the concept in everyday life (e.g., restaurants, golf courses, special events, hotels, airlines).

Excerpt Figure 1.
Definition of a Visitor Capacity

The supply, or prescribed number, of visitor opportunities that will be accommodated in an area.

The terms in the definition were chosen carefully. *Supply* means the quantity or amount available; *prescribed* means a decision by a person of authority; *number* means a specific number or numeric range; *appropriate* means in accordance with management direction; *visitor opportunity* refers to the integrated package of activities, settings, experiences, and benefits; *accommodate* recognizes that there are conditions and considerations that influence a decision and implies that the use of public resources is a privilege and has responsibilities; and area is an inclusive term that can refer to a facility, program, recreation system, or any geographic scale such as a site, unit, or region.

Purposes of a Visitor Capacity. A capacity is a concept and tool with widespread application and purpose in our everyday lives—restaurants, airports, golf courses, concerts, classrooms, low-income housing, hotel occupancy, lobster harvests, annual timber cuts, ozone alerts, air-travel operations, water storage, mortgage loans, insurance policies, power grids, military response, landfills, welfare benefits, prison facilities, urban housing density, emergency medical response, sport hunting, sport fishing, museums, amusement parks, group tours, and countless other manifestations.

The overarching function of a visitor capacity is to serve as one tool to help sustain natural and cultural resources, as well as the recreation opportunities and other benefits these resources afford the public. More specifically, the Task Force recognizes nine purposes of a visitor capacity (see Figure 2).

Types of Capacity Expression. A capacity is the number or numeric range related to the relevant social unit(s) detailed in the management objectives (or desired future conditions) for an area. In some cases, a specific number may be appropriate, while in others, a range may be more desirable. There are situations where multiple capacities will be decided for an area or where capacities will vary by the time of year. Examples of capacity expressions include:

- *35 designated backcountry campsites*
- *15 permitted wildlife viewers per morning*
- *200 camping groups per night*
- *10 large groups of horseback riders per summer season*
- *15 to 18 people per interpretive program or walk*
- *2,500 permitted use-days per season*
- *1 educational permittee per summer season, 3 per winter season*
- *2 research permits per year*
- *75 boats at one time of less than 25 hp on reservoir X*
- *16 motorized OHV groups per day*
- *5 PWCs at one time beyond 250 yards of shoreline*
- *20 snowmobiles per 45-minute intervals; 240 per weekday*
- *15 persons per timed entry to historic home, museum, or cave*
- *50 roaded-natural and 15 semi-primitive campsites in unit X*
- *80 to 100 raft launches per weekday; 150 to 170 per weekend*
- *550 boat slips*
- *50 shoreline campsites when water level is below 2550 elevation*
- *25 ice fishing groups at one time, 4 holes per party*
- *30 to 40 vehicles at one time at the trailhead*
- *200 to 250 persons at one time on the summit*

In any case, the numeric capacity represents the supply of appropriate visitor opportunities that will be accommodated in an area beyond which important resources, recreational opportunities, or other important values may be at risk.

Excerpt Figure 2. Multiple Purpose of a Visitor Capacity

Supply measurement: a numeric capacity is a measurement of the supply of available recreation opportunities that will be accommodated in an area.

Trigger for actions and resources: a capacity is a trigger point (i.e., a number or numeric range), whereby as current use approaches or exceeds the available supply, predetermined management responses can be activated or resources allocated. A numeric capacity is, in effect, a trigger or signal to justify and activate a suite of management responses. In some instances, use exceeding capacity may justify the expansion of the supply of appropriate recreation opportunities, and in other instances, it may justify the alteration or limitation of use or demand.

Public and resource risk management: a numeric capacity is a reasonable and responsible risk management tool for situations where nature or human activity creates a high-risk environment for the public, or where human behavior might put the natural or cultural resources at risk.

Private sector and community predictability: a numeric capacity provides clarity for business people to act and plan accordingly. By comparing current demand with available supply, private sector permittees and communities can anticipate their growth trend and potential, plan appropriate investment opportunities or divestiture steps, or take collaborative actions with land managers to mitigate negative consequences of demand approaching or exceeding capacity.

Visitor trip planning: a numeric capacity, particularly when compared to real-time use levels, can be very helpful information to a discerning recreationist. For example, visitors might find it useful to be informed that a beach, backcountry lake area, or battlefield is at 30%, 90%, or 120% of visitor capacity. This information may result in a "voluntary redistribution" of people across place or time while still allowing freedom of choice, and help the quality of the experience.

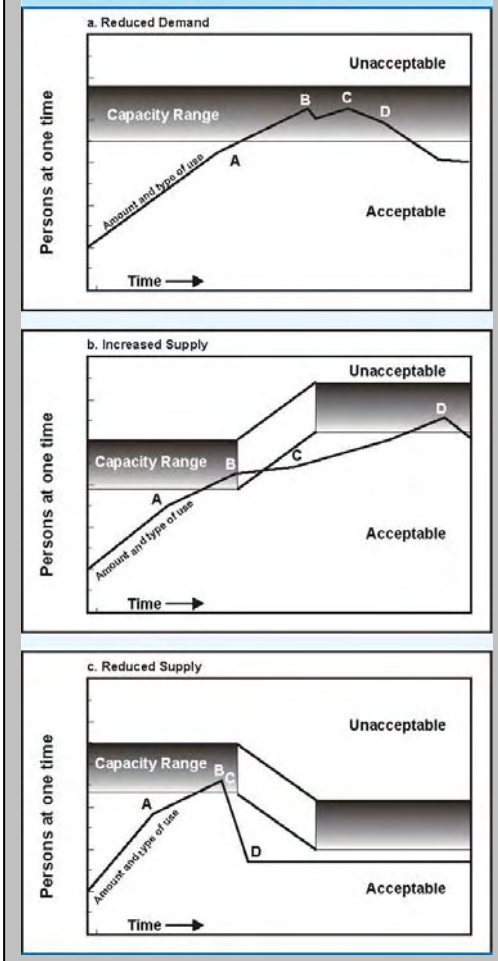
Administrative and historic record: complex decisions need to have supporting documentation detailing how and why decisions were made, and the process that was used. This record becomes the historic anchor from which to learn by experience and to compare yesterday with today's new information, data, and circumstances. It also is vital in responding to judicial inquiries for demonstrable evidence of the sound professional judgment.

Regional recreation planning: numeric capacities are fundamental for regional recreation planning, recreation demand and supply analysis, multi-jurisdictional allocation decisions, coordinated visitor trip planning information systems, identification of recreation facility needs and investment opportunities, and identification of alternate or substitute opportunities reasonably nearby when access is limited at a particular site.

Allocation decisions: a numeric capacity is the supply of available recreation opportunities and is fundamental for making allocation decisions involving where, when, or how many of a particular recreation opportunity can be accommodated (e.g., outfitter and guide permittees, birders, concessionaires, mountain bikes, personal water craft, youth groups). Similarly, a numeric capacity metric is fundamental for making multiple use allocations decisions (e.g., timber harvesting, research closures, reservoir drawdown).

Limiting public use: a numeric capacity can serve as the measurement of allowable use or access that is permissible for a certain time or place.

Excerpt Figure 3. Capacity Can Trigger



Triggering a Change in Supply or Demand

A capacity can trigger a change in either the demand for, or supply of, visitor opportunities. During a planning process in which a visitor capacity is established, it would also be helpful to establish one or more trigger points that serve as agreed-upon visitation levels for activating a management review. That is, as visitor use (demand) increases towards or is within the capacity range, it would activate a pre-determined trigger(s) to signal consideration of alternative management responses.

Figure 3 graphically depicts how a capacity can trigger a change in the supply or demand in visitor opportunities. Figure 3a depicts a desire to decrease the amount of visitor opportunity through one or more management actions (i.e., reducing visitor demand of an area). Figure 3b depicts a desire to increase the amount of visitor opportunity (i.e., increasing the supply or capacity of an area) through one or more management actions, while Figure 3c depicts the desire to reduce the supply of visitor opportunity (i.e., reducing the supply or capacity of an area).

There are many management actions, and combinations of actions, that can affect the demand or supply of visitor opportunities in an area. Examples would include a change in the design, location, or type of facilities and infrastructure; site hardening; facility or site rehabilitation and restoration; a change in management presence or regulations; an increase in visitor interpretation or stewardship programs such as Leave No Trace, Tread Lightly, and OHV Safety Rider; an increase in interagency marketing efforts to provide better information about the available recreational opportunities in the region; a reallocation or tradeoff of visitor opportunities on nearby lands to mitigate for the change of opportunities on other lands; an alternative transportation system; an inducement for visitors to distribute themselves willingly across time or place of visit; a reservation system; a differential fee program; a real-time intelligent visitation system conveying the current use/capacity level ratio (e.g., 20%, 80%, 120% of capacity); designating location or time of visit (e.g., assigned campsite, climbing route, boat launch time, limited hunting unit, Tuesday mountain biking and Thursday horseback riding); and time or area closures.

The Task Force wishes to highlight two important cautions. First, public land managers manage an area to provide a particular type of opportunity to the public. Each recreation opportunity is an integrated package of activities, settings, experiences, and benefits (see Figure 4). Thus, to change the setting might also change the type of experience being provided the public. For example, changing the infrastructure and low-site density of a primitive campground to one with paved roads, flush toilets, and high-site density would change the type of recreation experience. Any change in supply or demand must therefore be consistent with the agency's mandate, mission, policy, and management objectives for the area in question.

Second, the Task Force embraces adaptive management and recognizes that visitor capacities will change with new science, professional experience, monitoring information, technology, trends, opportunities, and circumstances. Adaptive management embraces the concept that the quality of sound professional judgment is enhanced over time with clear and specific decisions, followed by adequate monitoring, learning, and adaption. However, any changes must not be arbitrary. A reasonable rule of thumb is that a change in capacity requires a level of information, science, analysis, certainty, and deliberateness that is greater than what was used to make the previous capacity decision.

Making the Linkage

Figure 8 depicts the basic conceptual relationship between recreation demand and supply. Recreation demand/supply analysis is a simple mathematical calculation involving the demand (numerator) divided by the supply or capacity (denominator). The calculation determines the recreation utilization rate. Stated otherwise, the recreation utilization rate is the percent of the recreation supply that is being used (or visited) at any particular location and time.

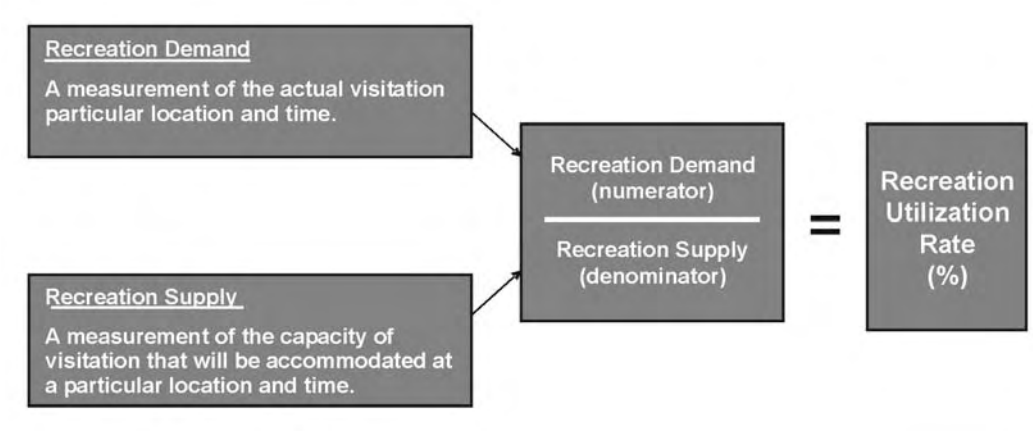


Figure 8.—Basic recreation demand and supply model.

The recreation utilization rate is the key metric, or conduit, that links recreation demand and supply. The concept of a utilization rate for recreation is no different than that of a hotel occupancy rate, high school attendance rate, pipeline utilization rate, fishery harvest rate, or highway traffic capacity rate.

A utilization rate will typically range from 0 percent to 100 percent, with the former meaning zero or no demand and the latter meaning full capacity or full utilization. Yet, there are times when the utilization rate for a highway, pipeline, golf course, fishery, restaurant, or classroom will exceed its prescribed capacity and the utilization rate will exceed 100 percent. In the context of a recreation setting, it is not unusual to find a utilization rate in excess of 100 percent capacity on major holidays or for special events. Figure 9 is an example of how to calculate a recreation utilization rate.

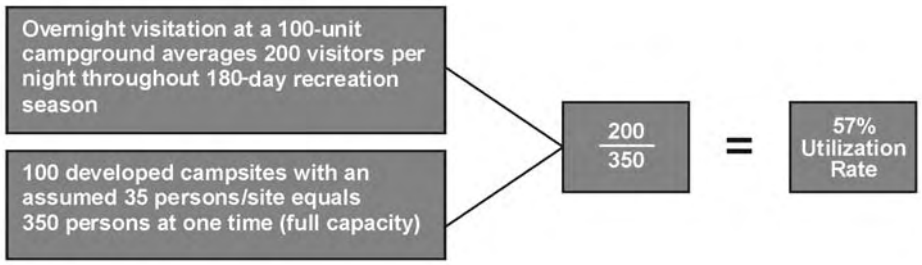


Figure 9.—Example of calculating a recreation utilization rate.

Figure 10 is an extension of figure 8. It depicts how one can compute the current utilization rate, and also, by applying the future demand estimates developed in section III of this Demand Guide, the future utilization rate can be computed. Figure 10 also clarifies that, for the purposes of recreation demand/supply analysis, demand is synonymous with actual visitation, and supply is synonymous with prescribed capacity.

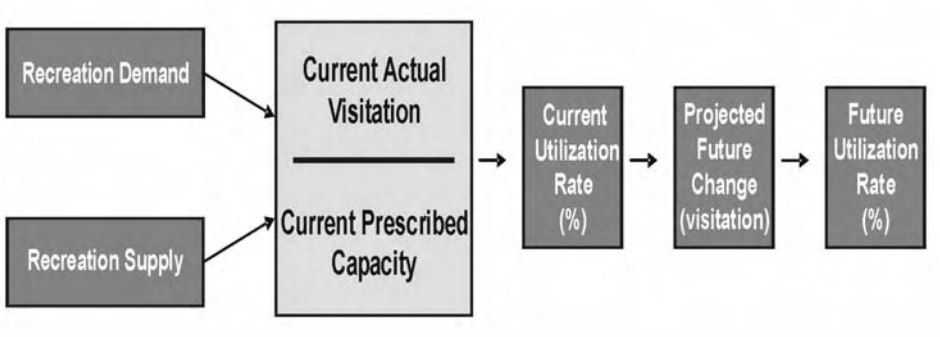


Figure 10.—An extension of the basic recreation demand and supply model.

The crosshatched box in figure 10 is the critical juncture in linking demand and supply; that is, both visitation and capacity need to be expressed using the same metric. For example, comparing the capacity or supply of 100 picnic tables or 300 miles of trails to the annual visitation by 5,000 visitors does not make sense. Table 12 offers examples of common metrics that will enable a demand/supply analysis. By examining each row in the table, the practitioner will note that the metrics are the same in the recreation demand and supply columns. The only difference is the "actual number" of demand or visitation versus the "prescribed number" of supply or capacity.

(***Note***: Guidance for determining the prescribed capacity can be obtained from the WROS User's Guidebook and final report of the Federal Interagency Task Force on Visitor Capacity on Public Lands and Waters. Both sources and Web sites are listed in attachment A).

Table 12.—Examples of common metrics to link recreation demand and supply

Demand metrics	Supply metrics
Actual number of persons at one time visiting	Prescribed number of persons at one time that will be accommodated
Actual number of groups (parties) at one time visiting	Prescribed number of groups (parties) at one time that will be accommodated
Actual number of boats at one time on the lake (river)	Prescribed number of boats at one time that will be accommodated (refer to WROS User's Guidebook for prescribed boating capacities)
Actual number of camping groups visiting per night	Prescribed number of camping groups per night that will be accommodated
Actual number of hikers visiting at one time per segment of trail	Prescribed number of hikers at one time per segment of trail that will be accommodated
Actual number of snowmobiles per time period (e.g., 2 hours) per segment of trail	Prescribed number of snowmobiles per time period per segment of trail that will be accommodated
Actual number of visitors to the visitor center at one time	Prescribed number of visitors to the visitor center at one time that will be accommodated
Actual number of vehicles at a trailhead at one time	Prescribed number of vehicles at one time at a trailhead that will be accommodated
Actual number of boat launches per time period (e.g., 2 hours)	Prescribed number of boat launches per time period that will be accommodated
Actual number of encounters with other whitewater rafting groups per day per river segment	Prescribed number of encounters with other whitewater rafting groups per day per river segment time that will be accommodated
Actual number of stream fisherpersons at one time per river segment	Prescribed number of fisherpersons at one time per river segment that will be accommodated
Actual number of off-road vehicles per time period per road segment	Prescribed number of off-road vehicles per time period per road segment that will be accommodated

Using the Linkage

Recreation demand/supply analysis can be a very useful planning and adaptive management tool. Practitioners can use the information to evaluate proposed management alternatives, justify management changes, request additional budget and personnel, shift programs and resources, develop real-time visitor capacity information systems, and collaborate with the other public and private recreation providers in the region. Another practical use of recreation demand/capacity information is in facility design. This information can help ensure that we design and construct facilities that will be adequate for the majority of the season in question (e.g., 85 percent of the summer weekends) yet not overbuilt to accommodate those peak-use weekends/holidays while being idle for the balance of the season.

Table 13 illustrates how the linkage can be displayed for ease of public presentation, decisionmaking, and for the administrative record. Table 14 illustrates how utilization rate information can be used as a planning or adaptive management tool to help make better decisions.

Table 13.—Example of a useful linkage between recreation demand and recreation supply (capacity)

Recreation activity	Recreation setting	Current supply (capacity) in 2005	Current demand (visitation) in 2005	Current utilization rate in 2005 (%)	Future demand in 2015 (% change from 2005)	Future utilization rate in 2015 (%)
Motorboating	Rural developed lake	250 boats at one time	150 boats at one time	60	+25	75
Houseboating	Suburban marina	100 houseboat slips	100 occupied houseboat slips	100	+15	115
Modern camping	Rural natural campground	250 available campsites	220 occupied campsites	88	+25	110
Wilderness camping	Primitive lake area	12 available campsites	5 parties per night	42	-20	33
Rafting	Semi-primitive river launch site	1 group every 2 hours on weekends	5 groups every 2 hours on weekends	500	+30	650
Snowmobiling	Rural natural trail	12 machines per mile	8 machines per mile	67	+25	83
Hiking	Rural developed trail	15 people per mile	5 people per mile	33	100	67
Visitor center	Suburban visitor center	50 people per hour	35 people per hour	70	+30	91
Horseback riding	Semi-primitive trailheads	15 horse trailer parking sites	18 horse trailer vehicles	120	-17	100

Table 14.—Example of using utilization rates to help prescribed management actions

Recreation activity	Recreation setting	Current utilization rate in 2005 (%)	Future utilization rate in 2015 (%)	Management prescription
Motorboating	Rural developed lake	66	75	Continue Level 1 monitoring; ensure that public is aware of boating capacities by posting notices at launches and on Web site.
Houseboating	Suburban marina	100	115	Assess feasibility of marina expansion or placement of mooring balls in cove; re-examine long-term houseboat mooring policy.
Modern camping	Rural natural campground	88	110	Increase to Level 2 monitoring; implement advanced reservation system as a visitor service; consider re-designing 15 picnic sites to campsites; inform local private campground owners of potential business opportunity given future utilization rates.
Wilderness camping	Primitive lake area	42	33	Discontinue designated campsite permit program; reduce monitoring to every 3rd year.
Rafting	Semi-primitive river launch site on weekends	500	650	Post public safety notices; encourage 30-minute separation times between launches; request voluntary re-distribution of private outfitters to weekdays; work with power company to release more water on Tuesdays and Thursdays; consider change in management to a rural natural; increase to Level 2 monitoring.
Rafting	Semi-primitive river launch site on weekdays	25	30	Reduce launch rates to encourage shift from weekend to weekday use; maintain semi-primitive management prescription.
Snowmobiling	Rural natural trail	67	83	Work with snowmobile club to develop a near real-time information Web site on snow, weather, and visitation conditions for all trails in the region.
Hiking	Rural developed trail	33	66	No change.
Visitor center	Suburban visitor center	70	91	Consider a time-entry system for all large groups, bus tours, and classes; add additional interpretive staff.
Horseback riding	Semi-primitive trailheads	120	100	Increase direct ranger contacts to encourage voluntary compliance of parking regulations; contacts local clubs.

Conclusion

This Demand Guide is intended to provide clarity and direction in addressing the increasingly important consideration of recreation demand in order to (1) help ensure that public agencies supply those recreation opportunities desired by the public and that they are appropriate given the agency mission and resources, (2) encourage coordination and collaboration among the many public, private, and non-governmental providers of recreation opportunities, and (3) help conserve recreation diversity and a spectrum of diverse recreation opportunities for the public.

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U.S. Department of Agriculture, Forest Service. February 1999. *Decision Protocol 2.0*. Ecosystem Management Coordination Staff, Washington, D.C.

Attachments

A	Helpful Information Sources
B	Overview of Data Collection Tools and Visitor Sampling

ATTACHMENT A

Helpful Information Sources

ATTACHMENT A
Helpful Information Sources

The following items may be useful for your recreation demand assessment.

American Recreation Coalition. Check research, statistics, and useful links at <www.funoutdoors.com>.

Applying Judicial Doctrine to Visitor Capacity Decision Making. 2003. Haas, G.E. Society and Natural Resources, 16 (8): 741-750.

Facts, Figures, and the Future. Consumer research can be found at <www.factsfiguresfuture.com>.

Hindsight Perspective Expands Capacity. May 2002. Haas, G.E. Parks and Recreation, 37 (5): 70-79. National Recreation and Park Association, Ashburn, Virginia.

Key Social and Environmental Forecasts Relevant to the National Park Service. 2000. U.S. Department of the Interior, National Park Service Social Science Program, Washington, D.C.
(www.nps.gov)

National Association of Recreation Resource Planners. Check planning resources at <www.NARRP.org>.

National Environmental Policy Act (NEPA) and Council of Environmental Quality Regulations.
(www.ceq.gov)

National Recreation and Parks Association.
(www.nrpa.org)

National Recreational Boating Survey State Data Report. 2004. Department of Defense, U.S. Coast Guard. Strategic Research Group.
(www.strategicresearchgroup.com)

National Survey on Fishing, Hunting, and Wildlife Associated Recreation. U.S. Department of the Interior, U.S. Fish and Wildlife Service.
(www.fws.gov)

National Survey on Recreation and the Environment (NSRE)
(www.srs.fs.usda.gov/trends/index)

National Visitor Use Monitoring Program (NVUM). U.S. Department of Agriculture, U.S. Forest Service.
(www.fs.fed.us/recreation/programs/nvum/)

Outdoor Industry Association.
(www.outdoorindustry.org/research)

Outdoor Recreation for the 21st Century. 2004. Venture Publishing, State College, Pennsylvania.
(www.venturepublish.com)

Outdoor Recreation in America. Recreation Roundtable Reports from 1999 to 2003. Roper Starch Survey. Washington, D.C.
(www.funoutdoors.com)

Public Involvement Manual. 2000. U.S. Department of the Interior, Bureau of Reclamation. (www.usbr.gov)

Recreation Trends and Markets: The 21st Century. 1999. Sagamore Publishing, Champaign, Illinois.
(www.sagamorepub.com)

Restoring Dignity to Sound Professional Judgment. September 2003. Haas, G.E. Journal of Forestry, 101 (16): 38-43, September.

ROS User's Guide. 1983. U.S. Department of Agriculture, U.S. Forest Service.
(fsweb.r9.fs.us/directives/user_aids/r9_userguides/fsm_ros)

Sampling and Estimating Recreation Use. 1999. U.S. Department of Agriculture, U.S. Forest Service General Technical Report PNW-GTR-456.

Social Analysis Manual. Volume 1. 2001. U.S. Department of the Interior, Bureau of Reclamation.
(www.usbr.gov)

State Tourism Offices. Contact the State office for tourism and economic development.

Statewide Comprehensive Outdoor Recreation Plans. Contact the State office for parks and recreation.

Techniques and Equipment for Gathering Visitor Use Data on Recreation Sites. 1995. U.S. Department of Agriculture, U.S. Forest Service Technology and Development Center, Missoula, Montana, 9523-2838 MTDC.

Travel Industry Association.
(www.tia.org)

Trends in Outdoor Recreation, Leisure and Tourism. 2000. CABI Publishing, New York, New York.
(www.cabi.org)

U.S. Census Data. U.S. Department of Commerce.
(www.census.gov)

Visitor Capacity on Public Lands and Waters: Making Better Decisions. 2002. U.S. Department of the Interior. Published by the National Recreation and Park Association, Ashburn, Virginia, October 2002.
(www.nrpa.org *or* glennehaas@comcast.net)

Water Recreation Opportunity Spectrum (WROS) Users' Guidebook. July 2004. U.S. Department of the Interior, Bureau of Reclamation.
(www.usbr.gov/pmts/planning/wros/index.html)

ATTACHMENT B

Overview of Data Collection Tools and Visitor Sampling

ATTACHMENT B

Overview of Data Collection Tools and Visitor Sampling

Numerous data collection tools are available for measuring demand. This section provides a brief overview while the helpful resources in attachment A provide sources of information and contacts to learn more about how to use these tools and sample visitors.

The practitioner is reminded that literally thousands of visitor data collection programs or studies have taken place in the last 20 years in the United States. There is likely vast experience inside and outside your agency. There are numerous data collection tools that have gone through rigorous scientific testing, review, and years of refinement. Some survey tools likely have current approval of the Office of Management and Budget. Don't waste time and effort to re-invent the wheel. Before one chooses a tool or begins to construct a tool, contact other recreation professionals (see information atmosphere for leads) in your agency and in other local, State, and Federal agencies, universities, tourism offices, the private recreation industry.

Table B-1 provides examples of direct and indirect data collection tools to measure visitor behaviors and preferences (or perceptions). Table B-2 provides a more detailed comparison of popular visitor data collection in the recreation profession. The purpose of these figures is to help the practitioner get a sense of their options and to provide an introduction to some of the more popular tools. These figures are followed by a brief overview of how to sample visitors.

Sampling is the process by which one selects which individuals to study. The goal of sampling is to ensure that you are systematic and consistent in your inquiry so that results may be generalized to the appropriate population and/or context.

There are two types of sampling: (1) probability and (2) nonprobability. Numerous books are available that discuss these concepts in more detail, but they are defined briefly below.

Probability Sampling is based on the principle of probability theory and suggests that a sample will tend to be representative of a population from which it is selected if every member of the population has the same chance of being selected in that sample. The most common types of probability sampling include:

- *Random* – Selecting observations based on a roll of the dice, a random numbers table, or some other random system.

Table B-1.—A sample of data collection tools to measure visitor behavior and preferences or perceptions

	Public behaviors (What are people doing?)	**Public preference (What are people thinking?)**
Direct measures (primary data)	Trail counters Turnstiles and radio frequency tags Registrations and licenses Reservations Guest logs Cameras (time lapse, video, aerial, satellite) Participant observations Usage mapping	Interviews (phone, mail, personal) Mail questionnaires Web-based questionnaires Comment cards Visitor diaries Focus groups Public open houses Post-it inventories
Indirect measures (secondary data)	Maintenance logs Trash and septic records Vandalism reports Field personnel observations Emergency medical records Highway traffic counts Sales and tax records	Media coverage/letters to the editor Agency mail, comments, and suggestions Vandalism reports Violations

- *Systematic* – Selecting every n^{th} observation from a list.

- *Stratified* – Grouping observations by similarity then making random selections from within each group.

Nonprobability Sampling techniques are used when rigorous description is not necessarily the purpose of the research. Types of nonprobability sampling include:

- *Purposive or Judgment* – Choosing observations based on researcher's best judgment or need.

- *Snowball* – Selection of relevant observations through referrals from other subjects.

- *Criterion* – Studying all cases that meet some pre-determined criterion of importance.

Table B-2.—A sample of tools for measuring recreation demand

Method	Types	Strengths	Weaknesses
Survey – A written method for probing public responses about themselves and/or their opinions, interests, feelings, preferences, knowledge, etc.	Mail, telephone, self-administered, or Web-based	Useful for moderate to large populations Useful for collecting representative data	Technical assistance often necessary for proper sampling, measurement, and analysis Can be time consuming and expensive Response rates can be low depending on technique used to administer
Interview – A technique for asking the public questions about themselves and/or their opinions, interests, feelings, preferences, knowledge, etc.	Phone or on-site personal	Allows respondents to elaborate or clarify their answers Useful for exploring issues in more depth	Can be time and labor intensive Not representative unless large sample Sometimes difficult to analyze open-ended responses
Focus Group – A group interview, usually lasting 1–2 hours, during which a moderator uses a pre-determined set of questions to focus the discussion	Includes public meetings, panels, and discussion groups	Relatively inexpensive Results are valid Great for uncovering perceptions, opinions, and attitudes of a group Findings easily understood, but analysis can be subjective	Can be time intensive in planning and facilitation Caution where widely generalizable results are desirable Analysis can be cumbersome and time consuming
Mechanical Device – The entire set of mechanical or electronic machines that help count and/or track the public moving through a location	Includes road and trail counters, turnstiles, cameras, remote sensing	Easy to use Useful for collecting counts in remote areas or areas that have minimal or no supervision Inexpensive once machinery is acquired	Counters provide numeric data only; camera visual data can be more useful Mechanical reliability and variations can be problematic

Table B-2.—A sample of tools for measuring recreation demand (continued)

Method	Types	Strengths	Weaknesses
Document Research – Letters, media, research, papers, or public registers that record public numbers or sentiment	Internal: Letters to the agency, guest logs, trailhead registers External: Includes national, regional, State survey data; media articles; findings from relevant research projects Census Data: Collection of demographic and economic data about various U.S. populations	Excellent for detecting specific issues Logs and registers are good for count data Many types of useful information can be obtained this way, and each can provide cross-check for other results Low cost	Difficult to determine context that may have influenced sentiment Content analysis can be time consuming Can be subjective unless analysis categories are established ahead of time or if multiple readers use convergent analysis techniques Age of data can affect analysis
Observations – An information-gathering technique based on personal observation and recording of visible social activities and behaviors	Participant – Where researcher participates in activity with subjects being studied Nonparticipant – Researcher observes but does not participate	Does not burden public Relatively uncomplicated and inexpensive Flexible Free from visitor self-reporting bias	Can be time consuming Possible observer bias Observation forms can be difficult to construct Does not give a complete picture of social or personal dynamic Can present ethical problems
Trace Measures – Use evidence of visitor behavior as means of understanding context	Includes vandalism, wear patterns, fingerprints, social trails, trash, and other evidence that may provide information about current visitor sentiment or behaviors	Easy data to gather – counting or measuring evidence Non-obtrusive May provide insights about displaced visitor Often useful for capturing visitor sentiment (e.g., vandalism)	Developing measurement rubrics or criterion can be tricky Does not necessarily provide answers about "Why?"

- *Quota* – Selection of observations that fit, in proportion, each category of interest.

Determining your sample includes the following considerations:

- **Who** – Describes the subjects that are to be studied, commonly referred to as the population. This may mean *people* who receive a survey, *documents* that will be reviewed, or *vandalism incidents* that need to be studied. A person, document, or vandalism incident is called a sampling unit.

- **How Many** – Describes the number of subjects to be studied, commonly referred to as the sample size. Calculating sample size involves determining the size of a sample that is representative of the population to which the conclusions will apply. For large populations, a large sample is often not feasible, so the percentage of subjects tends to decrease as the population size increases. As a rule of thumb, a sample of 400 observations for each major strata is desirable. Consultation with research stations, local survey research firms, or cooperative extension programs is advised.

- **Which People** – Describes the process of selecting the specific sampling units (e.g., people, sites, launch times) from a *sampling frame*. A sample frame is the total list or collection of subjects that represent the population to be studied. It may be a list of people in an area, a file of letters or documents, or a set of slides showing evidence of vandalism. Selecting which specific units will be studied will vary depending on the type of sampling. For example, in systematic probability sampling, every n^{th} person on the list, every n^{th} letter in the file, or every n^{th} slide would be studied. Decisions about which units to select are different in nonprobability purposive sampling. For example, it may make sense to study all the letters in the file or to view all the slides with vandalism evidence.

Summary of Terms

- *Sampling* – A process of selecting units, people, sites, or times to survey.

- *Sample population* – The population from which you wish to extrapolate.

- *Sample* – The portion of that population which will be surveyed.

- *Sampling frame* – A complete list of the sample units from which a sample is selected.

- *Sampling unit* – The specific units, people, sites, or times to survey.

Helpful Resources for More Information on Social Science Measurement and Sampling

Babbie, E.R. 1989. *The Practice of Social Research*. 5th Edition. Wadsworth Publishing (excellent diagrams and examples of sampling methods).

Kerlinger, F.N. 1986. *Foundations of Behavioral Research*. Holt, Rinehart, and Winston.

McMillan, J.H., and S. Schumacher. 1989. *Research in Education: A Conceptual Introduction*. 2nd Edition. Scott, Foresman and Company.