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# What are You Thinking?



## Short Cuts to Use the WROS Users' Guidebook

**“I don't want to read this whole thing, give me the short version”**  
go to the Executive Summary

**“I don't understand how this thing is organized”**  
refer to the Contents page

**“I am not familiar with WROS, but need to be”**  
read this Users' Guidebook

**“These terms are confusing to me”**  
go to the Glossary of Key Terms in Appendix A

**“I am familiar with WROS, but have lots of questions”**  
go to the Frequently Asked Questions (FAQs)

**“I need some examples of recreation opportunities”**  
read Chapter 1

**“I want to do a plan for my area, where do I start”**  
go to Chapters 2 and 3

**“I don't want to make a plan, but need advice on how to handle a management issue I have in a particular area”**  
go to the Management Guidelines section in Chapter 4

**“My big problem is the number of boats on my lake”**  
go to the Boating Capacity section in Chapter 4

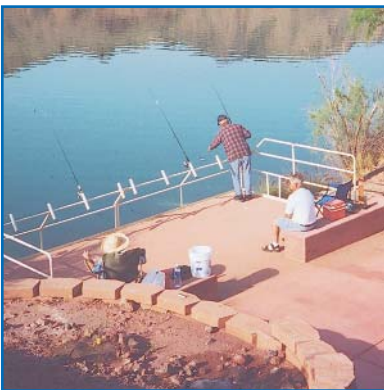
**“There is a lot of good information here, where can I find more”**  
go to the list of information sources in Appendix B

**“Who can I talk to about this stuff”**  
the author's contact information is in Appendix B

# Chapter I: Introduction



# Introduction



Above, some visitors need special facilities.

Below, reasonable access is an important issue.

The outdoor recreation profession has become much more sophisticated in the 41 years since the government's first comprehensive assessment in 1962, entitled the *Outdoor Recreation Resources Review Commission*.

*Water is a focal point of outdoor recreation. . . . Urban or rural, water is a magnet. Wherever they live, people show a strong urge for water-oriented recreation. There are many other reasons (purposes) for water resource programs, and recreation use often is incidental and unplanned. To say this, however, is to note how great are the opportunities.*

Today, the Bureau of Reclamation (Reclamation) recognizes that water recreation management is no longer a matter of simply building a boat ramp, dock, parking area, and restroom. Water recreation management involves a thorough understanding of the water resource and its capability, current and future visitors, the type of experiences sought, regional recreation demand and supply, resource management planning, economic and non-economic valuation, visitor capacity, and other dimensions.

The Water Recreation Opportunity Spectrum (WROS) is a tool that planners and managers can use to make better decisions. It is modeled after the Recreation Opportunity Spectrum (ROS) system, yet tailored to water resources such as reservoirs, lakes, rivers, bays, estuaries, wetlands, coastal zones, and marine protected areas.

This guidebook provides operational guidance on how to implement WROS in inventorying, planning, and managing recreation opportunities on and adjacent to water resources. It is intended to be adaptive, given changing public recreation use, new information from monitoring or science, and the practical field experience gained by its application.

This guidebook contains four chapters. *Chapter 1: Introduction* provides important background information on the system. *Chapter 2: WROS Inventory* describes the procedural steps to map the current water recreation opportunities that an area is providing and identifies inconsistencies where management action might be appropriate. *Chapter 3: WROS Planning* overviews how WROS inventory information can interface with a resource management planning process. And *Chapter 4: WROS Management* provides a set of management guidelines for recreation-related elements in each of the WROS classes. The appendix contains important supporting information and references to other sources of information.

## The Foundation of WROS

Several popular concepts in the outdoor recreation profession serve as the foundation for WROS.

**The average visitor does not exist.** Recreation science has revealed the great diversity in what outdoor recreationists desire for a recreation experience, expect upon arriving at a recreation site, and perceive and enjoy while recreating. Not only is there diversity among different recreation activity participants such as boaters, anglers, and campers, but there is also diversity among participants in each of these activities. For example, the recreation experience of sailing on a 200-acre urban reservoir for a few hours is certainly different from that of sailing on a 50-mile long rural reservoir for several days.

In much the same way as consumers can be segmented into groups by retailers based on some shared buying preferences, outdoor recreationists can be segmented into groups based on the recreation experiences they desire.

Recreationists also differ in other characteristics such as their place of residence, travel distance, recreational equipment, socioeconomic situation, racial and ethnic background, education, and knowledge of available opportunities.

The implication is that to plan and manage for a mythical average user is not appropriate because such an approach will leave out or not accommodate the diversity of the public interested in water resources. The conservation of recreation diversity is a fundamental purpose of the WROS system.

**Don't try to be all things to all people.** A specific lake, reservoir, or other body of water is a single resource within a regional and national system of water recreation opportunities. Each water resource can have special capabilities and opportunities to make an important contribution to the integrity of the larger system. Any individual lake, river, or reservoir cannot be all things to all people. Therefore, managers must identify the recreational role or niche of the water resource within the context of local, regional, and in some cases, national interests.

The implication is that it is not practical to plan and manage each water resource so that it provides all opportunities for all visitors. Each water resource should serve a particular recreational role or fill a niche within a larger

*Don't try to be all things to all people. A specific lake, reservoir, or other body of water is a single resource within a regional and national system of water recreation opportunities.*



Different boats have different requirements.

*Managers provide opportunities for visitors to participate in a type of recreation activity in a specific setting which is defined by its important physical, social, and management attributes, to realize a particular type of experience and subsequent benefits.*

system of diverse water recreation opportunities. The conservation of recreation diversity across a larger system will benefit the public and increase management effectiveness and efficiency for each specific water resource.

**Managers provide recreation opportunities.** The concept of recreation continues to evolve. 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 an experiential end. It also determined that the conditions of the resource 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 which is defined by its important physical, social, and management attributes, to realize a particular type of experience and subsequent benefits. Figure 1 depicts the key components of a recreation opportunity and how they are linked to one another.

Figure 1. A Recreation Opportunity						
<i>Recreation Activity</i>	+	<i>Setting</i>	=	<i>Experience</i>	>>>	<i>Benefits</i>
many activities		physical attributes managerial attributes social attributes		many dimensions multiple senses		individual community economic environmental
		<i>Managers Manage</i>		<i>Recreationists Consume</i>		<i>Society Gains</i>

As conveyed in figure 1, managers manage recreation activities and settings so that recreationists can consume a high quality, safe, and enjoyable recreation experience. Managers have the ability to change the activities and settings in an area to enhance the visitor's experience and maximize public benefits. The activities and setting attributes are the inputs and the outputs are the experiences and subsequent benefits.



**A seamless system of water recreation opportunities.** The American public is much more interested in enjoying high quality recreation opportunities than in understanding the names and missions of each local, State, and Federal agency that manages water resources. While public respect and understanding for an agency mission is desired and important, agencies should also strive to collaborate and contribute to the conservation of a larger system or network of water recreation opportunities.

The implication is that planning and managing for a seamless system of water recreation opportunities requires a set of recreation terms, concepts, and tools that is understood by all water recreation providers. This does not suggest that agencies need to change or replace existing approaches to planning or managing water recreation, but this does recognize the advantage of also employing a shared or common system (i.e., terms, concepts, and tools) to inventory, plan, and manage water recreation opportunities across agency jurisdictions. WROS is intended to be such an interagency tool for the conservation of recreation diversity and for ensuring a seamless delivery system of opportunities.

*The implication is that planning and managing for a seamless system of water recreation opportunities requires a set of recreation terms, concepts, and tools that is understood by all water recreation providers.*

## **An Overview of WROS**

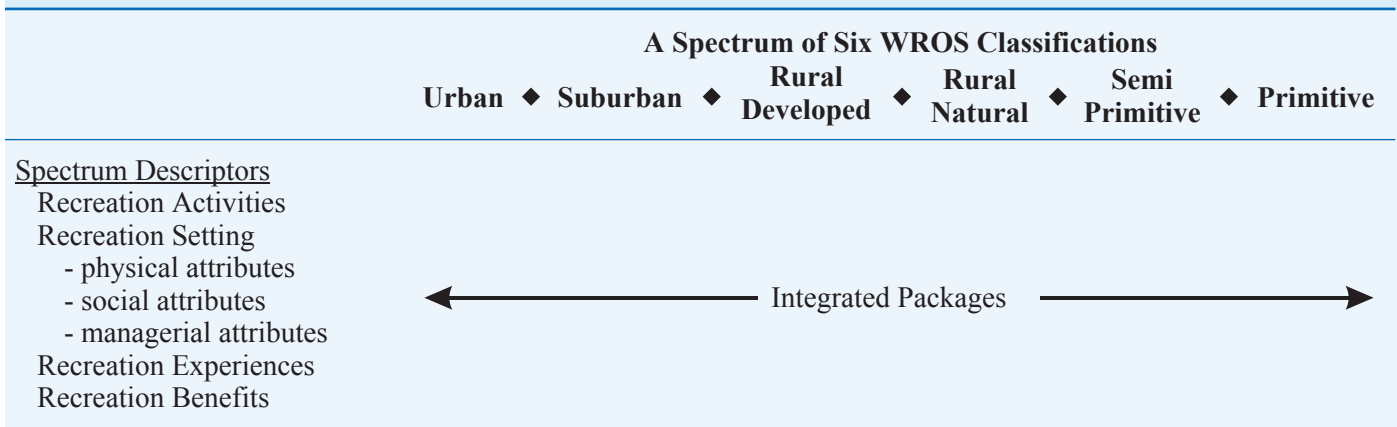
This section provides an overview of the important aspects of the WROS system.

**The goal of WROS.** As indicated in the preceding section, there is diversity among recreationists, water resource settings, and the agencies that manage these resources. This diversity is good and should be conserved. Likewise, recreation managers recognize that each specific water resource (e.g., lake, river, reservoir, bay) has a niche and contributes to a larger system of diverse recreation opportunities. Thus, *the overarching goal of WROS is to provide planners and managers with a framework and procedure for making better decisions for conserving a spectrum of high quality and diverse water recreation opportunities.*

**The WROS classifications.** WROS is a spectrum of six classifications of water recreation opportunities, that is, six integrated packages containing appropriate activities, settings, experiences, and benefits for each WROS class. Figure 2 identifies the classifications and the components of a recreation opportunity.

*WROS is a spectrum of six classifications of water recreation opportunities, that is, six integrated packages containing appropriate activities, settings, experiences, and benefits for each WROS class.*

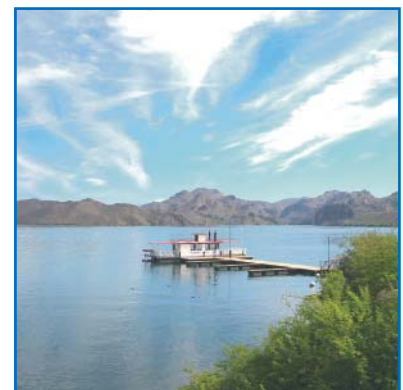
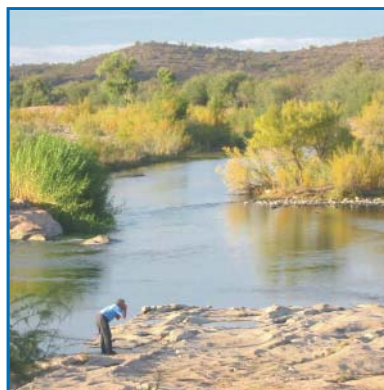
Figure 2. The Water Recreation Opportunity Spectrum



*Recreation activities* are the leisure pursuits most commonly understood and referred to in the literature. There are hundreds of examples of recreation activities, and the list continues to grow because of new technology and changing public interests. Of course, not all activities can be provided in the same location, and a manager must decide which activities are appropriate for an area. WROS helps managers decide the appropriateness of various recreation activities by offering a general illustration of those that may be appropriate in each WROS class. (See figure 3.) It is important to note that figure 3 illustrates the general framework of WROS. There will be situations where a particular activity may or may not be appropriate. Sound professional judgment and due consideration of the local situation is needed to decide what are appropriate recreation activities.

Left, wildlife contribute to a visitor's experience.

Right, dramatic and expansive views are attractive to people.



**Figure 3. A Generalized Representation of Recreation Activities by WROS Class**

	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
<u>Water-Based Activities</u>						
water skiing/wake boarding	←	←	←	←	←	←
jet boating	←	←	←	←	←	←
personal water craft	←	←	←	←	←	←
low-speed motor boating	←	←	←	←	←	←
fishing	←	←	←	←	←	←
houseboating	←	←	←	←	←	←
rafting	←	←	←	←	←	←
canoeing	←	←	←	←	←	←
kayaking	←	←	←	←	←	←
swimming	←	←	←	←	←	←
diving/snorkeling	←	←	←	←	←	←
para-sailing	←	←	←	←	←	←
<u>Water-Related Land Activities</u>						
developed campgrounds	←	←	←	←	←	←
rustic campgrounds	←	←	←	←	←	←
backpacking	←	←	←	←	←	←
off-highway vehicles	←	←	←	←	←	←
horseback riding	←	←	←	←	←	←
wildlife viewing	←	←	←	←	←	←
hunting	←	←	←	←	←	←
golfing	←	←	←	←	←	←
swim beaches	←	←	←	←	←	←
snowmobiling	←	←	←	←	←	←
picnicking	←	←	←	←	←	←
interpretive programs	←	←	←	←	←	←
hiking	←	←	←	←	←	←

*A recreation setting* is composed of physical, social, and managerial attributes. It is the combination of attributes that shapes or molds a specific activity into a particular experience. Managers spend most of their time and effort managing the recreation setting. The management guidelines in *Chapter 4: WROS Management* provide more detailed guidance for achieving optimum results.

Figure 4 illustrates various physical, social, and managerial attributes that can affect the desired recreation experience for an area. Figure 4 is not intended to be an exhaustive list, nor is it intended to suggest that each of these attributes must be considered. Furthermore, some attributes could be listed in more than one column (e.g., historic resources).

**Figure 4. Examples of Recreation Setting Attributes**

<b>Physical Attributes</b>	<b>Social Attributes</b>	<b>Managerial Attributes</b>
aquatic vegetation water quality soils/rocks/cliffs topography/slope fish and wildlife natural sounds visual resources water flows water elevations lightscapes terrestrial vegetation endangered species human development -- industrial/commercial -- municipal/residential -- man-made structures -- infrastructure water surface acreage river length, width, gradient natural hazards air quality natural beauty geologic formations climate and winds	recreationists (type, number) visitor expectations patterns of visitation visitor behaviors visitor safety issues visitor conflicts vandalism and litter automobiles and trains historic sites cultural resources adjacent private land uses special uses or permits special values density of use types, size, and speed of boats shoreline activity airplanes commercial shipping type and level of unnatural sounds (noise) nuisance behavior unlawful activities	recreation facilities water storage facilities water delivery systems rules/regulations interpretation fees and charges site design health and safety closures length of season recreation maintenance recreation programs law enforcement/security signage restoration activities administrative sites reservoir drawdown water safety lights/markers timed flow releases fishery management vegetative management access roads/launches accessible facilities personnel and volunteers level of patrol

In the context of WROS, it is the totality of these setting attributes that converts a recreation activity into a recreation experience and subsequent benefits. Figure 5 provides a short paragraph describing the general nature of the setting attributes for each class for the purpose of introducing WROS, while *Chapter 4: WROS Management* provides the guidelines for some 115 setting attributes.

**Figure 5. A Generalized Description of the Recreation Setting by WROS Class**

**Urban Setting:** An urban WROS area may be found in extensively developed and populated cities and metropolitan spaces where virtually the entire landscape contains human-built structures. Municipal, industrial, commercial, and residential land uses dominate, and the sights, sounds, and smells are typical of a city environment. Natural features may be found in small neighborhood parks, commercial courtyards, streetscapes, riverways, residential gardens, or landscaping. The water resources tend to be highly channelized, manipulated, or altered to contain large fluctuations in water flow and for the protection of public safety and property. There is a great deal of management presence (e.g., personnel, rules, facilities, signs, services, conveniences, and security). Recreation use is very extensive, there is a great deal of diversity, socialization, and concentration, and there is a sense of security and conveniences. The sights, sounds, and smells of recreation and non-recreation use (e.g., municipal, industrial, commercial) are dominant in an urban setting. Examples of an urban WROS class may include the San Antonio Riverwalk, Denver’s South Platte River, the Potomac River in the District of Columbia, Tampa Bay, Baltimore Harbor, San Francisco Bay, the Chicago waterfront on Lake Michigan, and the Colorado River as it flows past Laughlin, Nevada.

**Suburban Setting:** A suburban WROS area is on the fringe of the urban area. The sights, sounds, and smells of development and built structures are widespread. The built environment tends to be commercial and residential. The sights, sounds, and smells of commerce and everyday living are very obvious and prevalent, while naturally appearing settings may be found in community parks, greenways, trails, open space, natural areas, wetlands, estuaries, and tidal marshes. The water resources tend to be highly channelized, manipulated, or altered to contain large fluctuations in water flow and for the protection of public safety and property. Recreation management is very prevalent (e.g., personnel, rules, facilities, signs, services, conveniences, security). Recreation use, diversity, socialization, concentration, sense of security, and conveniences are very prevalent and obvious. The sights, sounds, and smells of recreation and non-recreation use (e.g., municipal, industrial, residential) are obvious but not dominant in a suburban setting. Examples of suburban WROS areas can be found on the outer edges of most metropolitan areas in the United States.

**Rural Developed Setting:** A rural developed WROS area is beyond a metropolitan area and the suburban ring of development. Rural developed areas may serve as “bedroom” communities for urban areas and may contain working farms and ranches, and towns and primary road networks are common. Development will be prevalent and common, yet the setting has a pastoral sense because of an interspersing of forests, water resources, hills, valleys, canyons, wetlands, open spaces, and agricultural land uses. Natural appearing shoreline edges are common, although various water controls or other structures are also common. Recreation management is prevalent and common but not as extensive as in an urban setting (e.g., personnel, rules, facilities, signs, services, conveniences, security). Recreation use, diversity, socialization, concentration, sense of security, and conveniences are common but less so than in a developed suburban or urban setting. The sights, sounds, and

**Figure 5 Continued. A Generalized Description of the Recreation Setting by WROS Class**

smells of recreation and non-recreation use are common, yet interspersed with locations and times when a sense of tranquility and escape from everyday challenges may be experienced by the urbanized visitor. Examples of rural developed areas may include areas with country estates, second homes and cabins, dams, power stations, primary and secondary roads, communication lines, resorts, marinas, small communities, full-service campgrounds, county and State parks, farms, ranches, and small commercial and industrial establishments.

**Rural Natural Setting:** A rural natural WROS area is a considerable distance from metropolitan areas and communities. Natural features are predominant on the landscape, and the presence of development is occasional or infrequent. Agriculture, tourism, and outdoor recreation are often primary industries. Rural natural areas are often large enclaves of public lands and waters. Natural resources dominate the landscape. The sights, sounds, and smells of development are infrequent. The water resources are bordered by natural appearing settings. Water controls or other structures are occasional along the shoreline. Management is occasionally noticeable in the form of patrols, facilities, signage, conveniences, and full services. Visitors desire a sense of tranquility and escape from their daily routine. Opportunity for visitors to see, hear, and smell nature is prevalent and common, as are occasions to enjoy periods of solitude. Recreation use, diversity, socialization, concentration, sense of security, and conveniences are periodic and occasional. Examples of a rural natural area might include unincorporated rural areas with occasional secondary and unpaved roads, small cabins, single residences, farms and ranches, rustic campgrounds, rural county and State parks, power lines, small stores and fuel services, and areas often bordering or surrounded by large expanses of public lands and waters.

**Semi Primitive Setting:** A semi primitive WROS area is a large expanse of natural resources that is far from any city or metropolitan area and a considerable distance from small communities, subdivisions, or developments. Natural resources dominate the landscape. Development is minor and the sights and sounds of human activity are few, but may include such evidence of human activity as distant farming operations, power lines, livestock, small buildings, old roadways, historic structures, and historic logging or mining. These water resources are often within large expanses of public lands and waters. Management, in the form of patrols, facilities, and signage, is seldom noticeable and the visitors are expected to have the equipment and skills to be able to navigate and enjoy this setting. Visitors desire a sense of tranquility and escape from their daily routine. Facilities are rustic and blend well into the setting. Resource protection is very important. Opportunity for visitors to see, hear, and smell nature is wide spread. Visitors sense solitude and remoteness. Examples of semi primitive settings are large expanses of State and Federal lands and waters that are commonly designated as a wild and scenic river, wilderness, backcountry lake, headwater, marine reserve, roadless area, or other type of State, Federal, or international protected area.

**Primitive Setting:** A primitive WROS area is a very large expanse of natural resources very far from development and settlement. Any sights, sounds, or smells of human activity are rare and very minor. The water resources and shorelines appear natural and show very little, if any, evidence of past human use such as historic homesteads and roadways. Management relies on visitor cooperation and stewardship, and activities often focus on resource protection, restoration, and monitoring. A sense of remoteness, wildness, solitude, and self-reliance is dominant among visitors. Visitor comforts, conveniences, and concentrations are not appropriate. Examples of primitive settings are large expanses of Federal lands and waters that are miles from development and settlement. The settings are commonly designated as a wild and scenic river, wilderness, backcountry lake, headwater, marine reserve, roadless area, or other type of Federal or international protected area.

*A recreation experience* is the psychological and physiological response to participating in a particular recreation activity and setting. The experience is the output of management's efforts and represents what is consumed by the recreationist. WROS helps planners and managers to focus on the recreation experience that is being provided and provides a general description of recreation experience for each WROS class.

*A recreation experience is the psychological and physiological response to participating in a particular recreation activity and setting.*

Recreation science has contributed to identifying the important dimensions of a recreation experience, often referred to as motivations, psychological outcomes, or multiple satisfactions. Recreation science also recognizes that humans use all five senses to perceive or experience a situation; that is, a recreation experience can be affected by what one sees (e.g., wildlife and litter), hears (e.g., natural sounds and loud engine noises), smells (e.g., grasses and trees, barbecue, and pollution), touches (e.g., water temperature, beach sand, and broken glass), and tastes (e.g., water, food, and exhaust fumes). Figures 6 and 7 provide a general description of the important dimensions and senses that define the recreation experience in each WROS class. It is important to bear in mind that these generalizations are just generalizations and may need to be adapted to more accurately reflect a particular local situation. WROS encourages flexibility and adaptability based on sound professional judgment.



The speed, wake, and sound of boats can alter a recreation setting.



Management rules and regulations can alter a recreation setting.



Safety considerations are very important.

**Figure 6. Examples of Recreation Experiences by WROS Class**

	WROS Spectrum					
	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
<p><b>Often Common Across Spectrum</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Enjoy the outdoors</li> <li><input type="checkbox"/> Get refreshed</li> <li><input type="checkbox"/> Have fun and pleasure</li> <li><input type="checkbox"/> Enjoy friends and family</li> <li><input type="checkbox"/> Change of pace</li> <li><input type="checkbox"/> Get away from usual demands of life</li> <li><input type="checkbox"/> Reduce stress</li> <li><input type="checkbox"/> Chance to think and ponder</li> <li><input type="checkbox"/> Enjoy physical exercise</li> <li><input type="checkbox"/> Bond with family and friends</li> <li><input type="checkbox"/> Help others develop skills</li> </ul>	<i>Important in all Settings</i>					
<p><b>Often Varies Across Spectrum</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Experience the sights, sounds, and smells of nature</li> <li><input type="checkbox"/> Learn about nature and culture</li> <li><input type="checkbox"/> Chance to dream and reflect</li> <li><input type="checkbox"/> Sense of adventure and challenge</li> <li><input type="checkbox"/> Sense of awe, wonder, humility</li> <li><input type="checkbox"/> View wildlife and natural wonders</li> <li><input type="checkbox"/> Experience challenge and risks</li> <li><input type="checkbox"/> Sense of self reliance, freedom, choice</li> <li><input type="checkbox"/> Experience tranquility and peacefulness</li> <li><input type="checkbox"/> Experience solitude</li> <li><input type="checkbox"/> Experience new and different things</li> <li><input type="checkbox"/> Sense of physical exertion</li> <li><input type="checkbox"/> Feel inspired</li> </ul>	<i>Less Important</i> ← → <i>More Important</i>					
<p><b>Often Varies Across Spectrum</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Chance to watch and be around other people</li> <li><input type="checkbox"/> Opportunity to socialize</li> <li><input type="checkbox"/> Opportunity to meet new people</li> <li><input type="checkbox"/> Sense of competition with others</li> <li><input type="checkbox"/> Exhilaration of speed and thrills</li> <li><input type="checkbox"/> Test one's skills and equipment</li> <li><input type="checkbox"/> Feel safe and secure in the outdoors</li> <li><input type="checkbox"/> Enjoy comforts and conveniences in the outdoors</li> <li><input type="checkbox"/> Opportunity for a brief respite from everyday life</li> </ul>	<i>More Important</i> ← → <i>Less Important</i>					



**Figure 7. A Generalized Description of the Recreation Experiences by WROS Class**

**Urban Recreation Experience:** Area provides very limited opportunities to see, hear, or smell the natural resources (e.g., forests, wildlife, aesthetics) because of the extensive level of development, human activity, and natural resource modification; watching and meeting other visitors is expected and desired; large group activities such as guided fishing, tour boat sightseeing, and beach sports are popular; opportunity to briefly relieve stress and to alter everyday routines is important; socializing with family and friends is important; large groups and families are common; a high sense of safety, security, comfort, and convenience is central and dominant; the mix of recreation activities may be diverse, ranging from those of relaxation and contemplation (e.g., sunbathing, reading, nature walking) to those of physical exertion, thrills, excitement, and challenge (e.g., para sailing, jet boating, water skiing); area often attractive to short time visitors, large affinity groups, tours, school groups; area may serve as a transportation corridor for transient visitors or as a staging area for others traveling to nonurban settings; area is popular with local urban residents as well as nonresident first-time tourists.

**Suburban Recreation Experience:** Area provides little opportunity to see, hear, or smell the natural resources (e.g., forests, wildlife, aesthetics) because of the widespread and very prevalent level of development, human activity, and natural resource modification; watching and meeting other visitors is expected and desired; opportunity to briefly relieve stress and to alter everyday routines is important; socializing with family and friends is important; large groups and families are common; a high sense of safety, security, comfort, and convenience is central and dominant; the mix of recreation activities may be diverse, ranging from relaxation and contemplation (e.g., sunbathing, reading, and nature walking) to physical exertion, thrills, excitement, and challenge (e.g., para-sailing, jet boating, and water skiing); learning about natural or cultural history, ecology, and reservoir and river operations are important to some; area is popular with local suburban residents.

**Rural Developed Recreation Experience:** Area provides occasional or periodic opportunities to see, hear, or smell the natural resources (e.g., forests, wildlife, aesthetics) because development, human activity, and natural resource modification are common and frequently encountered: area is less developed and more tranquil than a suburban setting; opportunity to experience brief periods of solitude and change from everyday sights and sounds is important; socialization within and outside one's group is typical, and the presence of other visitors is expected; opportunity to relieve stress and to alter everyday routines is important; a moderate level of comfort and convenience is important; a sense of safety and security is important; the array of recreation activities may be diverse, ranging from relaxation and contemplation (e.g., sunbathing, sailboating, shoreline fishing) to physical exertion and challenge (e.g., competing in shoreline and water sports, tournament fishing, ice fishing, water skiing, and kayaking); area is typically attractive for day-use and weekend visitors from local metropolitan areas or nearby communities, short-term campers, recreation vehicle users, large groups, and adventure tourists within a day's drive.

**Rural Natural Recreation Experience:** Area provides frequent opportunities to see, hear, or smell the natural resources (e.g., forests, wildlife, and aesthetics) because development, human activity, and natural resource modifications may be occasional and infrequent; noticeably more natural, less developed, and more tranquil than an urban setting; socialization with others outside one's group is not very important, although the presence of others is expected and tolerated; opportunity to relieve stress and to get away from built environment is important; a high sense of safety, security, comfort, and convenience is not important or expected; a sense of independence and freedom with a moderate level of management presence is important; moments of solitude, tranquility, and

**Figure 7 Continued. A Generalized Description of the Recreation Experiences by WROS Class**

nature appreciation are important; experiences tend to be more resource dependent, although they may be diverse, including relaxation and contemplation (e.g., camping, sunbathing, canoeing, sailing, and boat fishing), socialization, physical exertion, and challenge (e.g., competitive tournament fishing, kayaking, waterskiing, hunting, and belly boat fishing); area is typically attractive to extended weekend and longer-term visitors desiring to experience the outdoors and to be away from large numbers of other people; popular with overnight visitors using recreation vehicles, tents, and rustic cabins.

**Semi Primitive Recreation Experience:** Area provides widespread and very prevalent opportunities to see, hear, or smell the natural resources (e.g., forests, wildlife, and aesthetics) because development, human activity, and natural resource modifications are seldom encountered; opportunity to experience a natural ecosystem with little human imprint is important; a sense of challenge, adventure, risk, and self-reliance is important; solitude and lack of contact with other visitors, managers, and management is important on the water and at destination sites; the recreation experiences tend to be more resource-based; a sense of independence, freedom, tranquility, relaxation, nature appreciation and wonderment, testing skills, and stewardship is typical; opportunity often requires more trip planning and preparation, travel distance of one or more days, physical effort, and duration; area provides opportunities for the more adventure-based enthusiasts (e.g., fly and float fishing, hunting, backcountry camping, canoeing, rafting, and nature viewing). Overnight visits are typically with tents in settings with few conveniences and facilities. Extended stays may be accommodated. Adventure recreationists and ecotourists are attracted to this setting. Inexperienced recreationists or visitors new to the area may be uncomfortable with the remoteness and the need to be self-reliant.

**Primitive Recreation Experience:** Area provides a great deal of opportunities to see, hear, or smell the natural resources (e.g., forests, wildlife, and aesthetics) because development, human activity, and natural resource modifications are rare; opportunity to experience natural ecosystems with very little and no apparent human imprint is paramount; natural views, sounds, and smells dominate; a sense of solitude, peacefulness, tranquility, challenge, adventure, risk, and self-reliance is important; solitude and the lack of the sight, sound, and smells of others is very important; a sense of freedom, tranquility, humility, relaxation, nature appreciation and wonderment, and stewardship is central and dominant; area provides opportunities for human powered activities such as canoeing, kayaking, fly fishing, hunting, floating, and backpacking; the high speed and noise of motorized conveyances is typically inappropriate for this area; visitation often requires considerable trip planning and preparation, travel distance, physical exertion, and duration; overnight visitors use tents in settings with no conveniences and facilities; adventure travelers and ecotourists from distant locations are often attracted to the undisturbed wildland setting.

*Recreation benefits* are improvements resulting from participating in quality outdoor recreation and tourism. These improvements or benefits may accrue to the individual recreationist and family or to the workplace, community, economy, or environment. WROS does not explicitly include a step to measure or inventory recreation benefits, but does encourage managers to (1) engage local communities in identifying important recreation benefits in the planning process, (2) include a description of the important benefits in the management plan, and (3) reference benefits in various public education and community communications. It is expected that the recreation benefits section will be strengthened in the future as WROS is used, field tested, and further refined. Figure 8 lists some of the benefits that accrue from recreation and tourism.

*Recreation benefits are improvements resulting from participating in quality outdoor recreation and tourism. These improvements or benefits may accrue to the individual recreationist and family or to the workplace, community, economy, or environment.*

<b>Figure 8. Examples of Recreation Benefits</b>	
<p><b>Individual or Personal Benefits</b></p> <ul style="list-style-type: none"> <li>physical exercise</li> <li>family togetherness</li> <li>self confidence</li> <li>skill development</li> <li>reflection/contemplation</li> <li>increased wellness/happiness</li> <li>increased quality of life</li> </ul>	<p><b>Community Benefits</b></p> <ul style="list-style-type: none"> <li>sense of place</li> <li>improved work performance</li> <li>community pride and spirit</li> <li>community attraction/appeal</li> <li>youth development</li> <li>increased quality of life</li> </ul>
<p><b>Economic Benefits</b></p> <ul style="list-style-type: none"> <li>support of local merchants</li> <li>economic stimulation</li> <li>more money from outside the area</li> <li>increased property values</li> <li>increased tax revenue</li> <li>increased investor appeal</li> </ul>	<p><b>Environmental Benefits</b></p> <ul style="list-style-type: none"> <li>increased knowledge of resources</li> <li>increased respect for environment</li> <li>increased stewardship/involvement</li> <li>increased collaboration</li> <li>increased political/social support</li> <li>increased conservation of nature</li> </ul>

To further envision the six WROS classes, the following photo collages provide examples of recreation activities and setting attributes by WROS class.

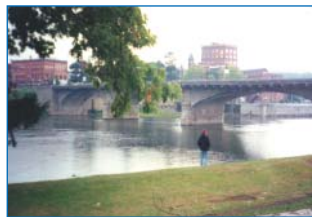
# Urban WROS Class

## Photo Examples

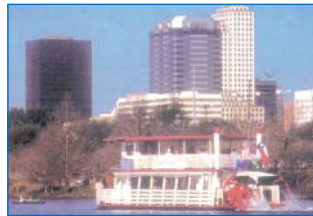
### Activity



### Physical



### Social



### Managerial



# Suburban WROS Class

## Photo Examples

### Activity



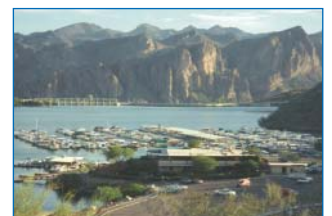
### Physical



### Social



### Managerial



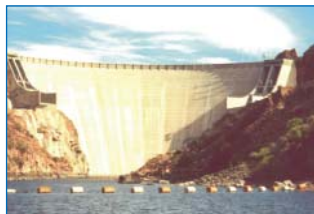
# Rural Developed WROS Class

## Photo Examples

**Activity**



**Physical**



**Social**



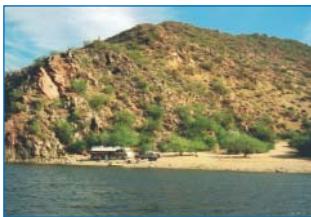
**Managerial**



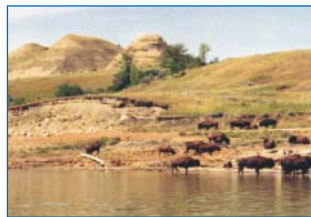
# Rural Natural WROS Class

## Photo Examples

### Activity



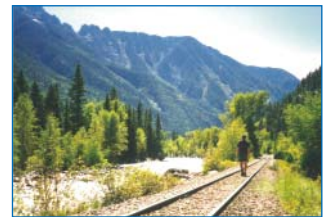
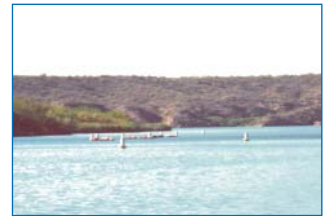
### Physical



### Social



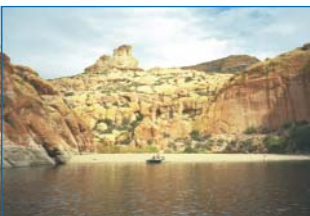
### Managerial



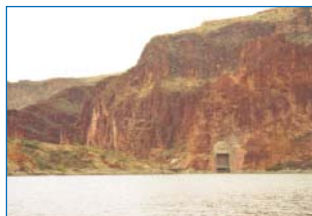
# Semi Primitive WROS Class

## Photo Examples

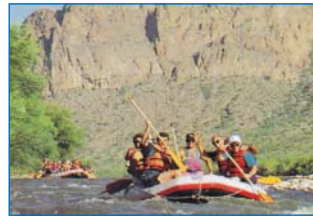
**Activity**



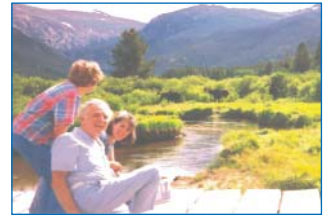
**Physical**



**Social**



**Managerial**





# Primitive WROS Class

## Photo Examples

**Activity**



**Physical**



**Social**



**Managerial**



*WROS is an inventory,  
planning, and  
management tool.*

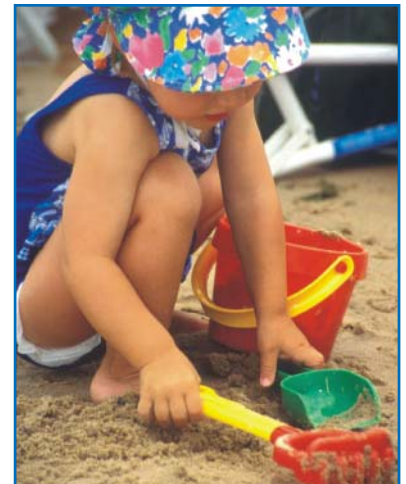
**The planning and management value of WROS.** WROS is an inventory, planning, and management tool. As such, it is valuable to the managing agencies, local communities, recreationists, and the private sector (e.g., tourism industry) for those tasks listed below:

- Inventory and map water recreation opportunities.
- Integrate recreation into the agency planning process.
- Compare recreation demand to the recreation supply of available opportunities.
- Provide a visual map (GIS compatible) of proposed planning alternatives.
- Evaluate the benefits and costs of proposed alternatives.
- Identify and manage a tourism niche for communities and the private sector.
- Plan and manage a regional system of water recreation opportunities.
- Identify and protect important natural and cultural resources.
- Increase public awareness of recreation choices and available opportunities.
- Decide type and location of visitor management activities.
- Prioritize, design, and locate facilities.
- Develop visitor capacities.
- Justify budget and personnel needs.
- Legally justify planning and management decisions.
- Provide interagency communication, consistency, collaboration, and coordination.
- Conserve a diversity of water recreation opportunities.
- Ensure high quality recreation experiences and benefits for current and future visitors and the local community.

## Design Criteria Used in Developing WROS

A variety of important considerations were identified early in the development of WROS. Design criteria were developed to help ensure that WROS would be efficient, effective, and of value to water resource planners and managers. The design criteria included:

- Interface with Reclamation’s Resource Management Planning process and other NEPA-compliant planning processes used by other agencies.
- Interface with the ROS system used by the USFS and BLM.
- Be consistent with the prevailing expert opinion in the recreation profession.
- Be relatively easy and inexpensive to use.
- Be able to integrate with other planning tools, data bases, and processes.
- Be appealing and understandable to recreating publics, communities, stakeholders, and private sector businesses.
- Provide objective criteria for reasoned and deliberate decision making.
- Accommodate flexibility and adaptation to special field situations.
- Use best available social and biophysical science.
- Accommodate change and adaptation through monitoring, research, and experience.
- Be reasonably applicable to a variety of water resource settings.
- Help ensure a high quality, safe, and enjoyable recreation experience.



Parks and beaches provide for multiple recreation uses.

## The Standard for WROS Decision Making

WROS is a framework that is flexible and adaptable to specific field situations. WROS does not replace management discretion and decision making, but rather, is a tool to help make decisions that are principled, reasoned, systematic, logical, tractable, and defensible.

While local planners and managers are empowered to adapt WROS to the local situation, it is important that these decisions be carefully considered so as to maintain the integrity of WROS. This section provides guidance on

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

decision making based on several fundamental principles found in decision science and State and Federal law (e.g., Administrative Procedure Act and the National Environmental Policy Act) and applied by the judicial system in the United States. The standard for WROS decision making incorporates (1) sound professional judgment, (2) preponderance of the evidence, (3) a rule of reasonableness, (4) a sliding scale rule of analysis, and (5) a scale of degree.

**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 on 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 decision makers 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 decision maker duly considers and is in conformance with relevant laws and regulations (e.g., NEPA).

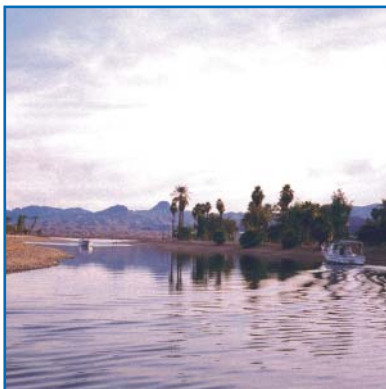
**Preponderance of the evidence.** Preponderance of the evidence is defined as a condition whereby most of the information, data, trends, professional opinion, and other facts and circumstances of a situation support the reasonableness of a particular decision or course of action more than another decision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

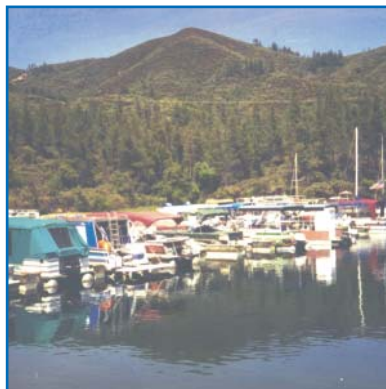
**Sliding scale rule of analysis.** This sliding scale rule states that the level of analysis used to implement WROS should be commensurate with the potential consequences of the decision; that is, managers need flexibility to make decisions based on a level of analysis that is commensurate with the 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, water operations, or the type or quality of the water recreation opportunity, the greater the level of analysis and deliberation. A sliding scale rule of analysis (see figure 9) can range from slight 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.

WROS uses a three-level sliding scale of analysis (see figure 9) that parallels the judiciary’s interpretation of due diligence by a responsible official: slight, ordinary, and extraordinary levels of analysis. The sliding scale should serve as a guide for managers.

*Managers need flexibility to make decisions based on a level of analysis that is commensurate with the purpose and potential consequences of the decision.*



No wake, 5 mph, or slow zones can contribute to a quality experience.



Moorings can provide an important service to the public.



Sound professional judgement is used to make decisions.

**Figure 9. Three Levels of WROS Analysis**

<b>Sliding scale of WROS analysis</b>	<b>Type of use for the WROS analysis</b>	<b>Level of detail and precision</b>	<b>Description of the WROS inventory</b>
<p>Level 1</p> <p><i>Coarse Filter</i></p>	<p>General administrative inventory; visitor brochures; routine visitor, resource, and maintenance decisions, etc.</p>	<p>Slight or low level of detail, intensity, effort, data, time, and precision.</p>	<p>Level 1 can be done by a knowledgeable recreation staff person with available information, no original data collection or field inventory, and in a relatively short period of time (e.g., 1–2 days of effort).</p>
<p>Level 2</p> <p><i>Moderate Filter</i></p>	<p>Regional inventories and plans; environmental assessments; assessments of impacts from proposed small to moderate scale changes in facilities, land and water uses, visitor regulations, etc.</p>	<p>Ordinary or moderate level of detail, intensity, effort, data, time, and precision.</p>	<p>Level 2 should involve a small interdisciplinary team of recreation experts, a field inventory using the WROS inventory protocol, development of a current and comprehensive water resource base map, and possibly some original data collection. Level 2 can be completed with a modest effort (e.g., 2–4 days of effort after selecting and training the team).</p>
<p>Level 3</p> <p><i>Fine Filter</i></p>	<p>NEPA-compliant planning, resource management plans, general management plans, assessments of impacts from proposed moderate to large scale changes in facilities, resource use, visitor management, etc.</p>	<p>Extraordinary or high level of detail, intensity, effort, data, time, and precision.</p>	<p>Level 3 should involve a larger interdisciplinary team of recreation experts and several long-time visitors to the area, an intensive field inventory using the WROS inventory protocol, a detailed and current base map, visitor survey information, and possibly some resource data collection. Level 3 requires substantial effort (e.g., 10–20 days of effort after selecting and training the team and excluding the visitor survey task).</p>

**Scale of degree.** The scale of degree in WROS is analogous to a yardstick used to measure inches and feet. For the yardstick to be effective, society needed to agree on, or standardize, the measurement of an inch and foot. In much the same way, the scale of degree in WROS is intended to help standardize the measurement of attributes for each WROS class. The scale of degree contains several qualitative terms and a quantitative expression. The terms listed under the six WROS classes in figure 10 are synonymous and are used interchangeably in the WROS inventory protocol (chapter 2) and in the management guidelines (chapter 4).

In the WROS inventory stage, a series of inventory sites on the water body are selected and inventoried by a team of experts. At each inventory site, the expert team is asked to *circle the degree, extent, or magnitude that the following attributes are present at this site*. In response, each team member circles the set of terms along the scale of degree in figure 8 that best represents his or her view. For example, structures and human activity in an urban setting are characterized as *dominant, extensive, a great deal, extreme, or apparent in 80 percent or more* of the setting. Conversely, evidence of other recreation use in a primitive setting is characterized as *very minor, rare, very little, or apparent on 3 percent or less* of the area. Use of the scale of degree in the WROS Inventory Protocol is described in *Chapter 2: WROS Inventory*.

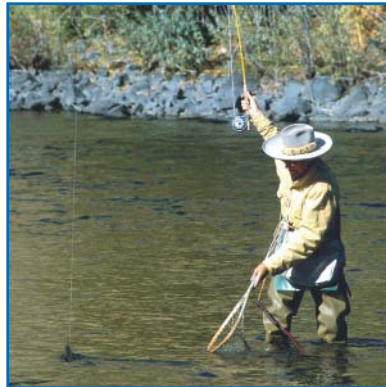
**Figure 10. The Scale of Degree Used in WROS**

<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
80-100%	50-80%	20-50%	10-20%	3-10%	0-3%
Dominant	Very prevalent	Prevalent	Occasional	Minor	Very minor
Extensive	Widespread	Common	Infrequent	Little	Very little
A great deal	Very obvious	Apparent	Periodic	Seldom	Rare
Extremely	Very	Moderately	Somewhat	Slightly	Not at all

In *Chapter 4: WROS Management*, the scale of degree is used in the guidelines to indicate the degree, extent, or magnitude that an attribute is *appropriate* in each WROS class. For example, the presence of full service bath facilities in an urban setting is characterized as being *extensive*, and conversely, *not at all appropriate* in a primitive setting. Note that there are a few attributes in chapter 4 and in the WROS Inventory Protocol (e.g., degree of solitude, degree of natural ambiance) where the scale has been reversed to ensure logic and integrity of the recreation opportunity.



Accessible facilities are important.



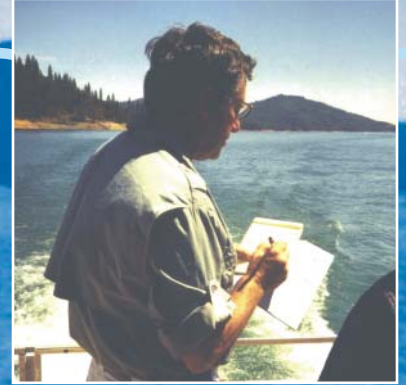
Different types of fishing activities require different site attributes.



Popular recreation sites often require intensive management.



## Chapter 2: WROS Inventory



# WROS Inventory



This chapter provides operational details of how to conduct a WROS inventory to map the current supply of recreation opportunities based upon measurement of the current physical, social, and managerial attributes in the area. Chapter 2 has three sections that (1) define the scope of the inventory, (2) describe the attributes and protocol used in the WROS inventory, and (3) detail the inventory steps to mapping the current supply of recreation opportunities.

## Defining the Scope

A variety of important decisions should be made and actions taken early to define the scope of the effort to be undertaken and what level of analysis will be required. Listed below are key questions and actions that are precursors to the actual WROS inventory.



**Develop a comprehensive base map.** The WROS inventory requires a quality base map and a compilation of all related documents and materials. Developing a comprehensive base map will define the study area as well as assist managers in understanding the level of effort that may be required. Some of the features that may be important include:

- |                                     |                                |
|-------------------------------------|--------------------------------|
| water-surface area                  | water operation facilities     |
| seasonal water levels               | special resources or values    |
| water depths                        | private land and rights of way |
| topography                          | navigational lights, markers   |
| primary and secondary roads         | subdivisions, communities      |
| power transmission lines            | buildings and structures       |
| aquatic and terrestrial vegetation  | recreation facilities          |
| hazards and shallows                | diversions, channels, riprap   |
| cultural and historic structures    | dam security area              |
| important fish and wildlife habitat | public health and safety areas |



Above and center, expert teams are important in the recreation inventory.

Below, signs are often needed but can change the visual setting.

The various documents and materials that might be collected include:

- Laws, regulations, policies.
- Maps, air photos, pictures, videos.
- Management and other operational plans.
- Special use permits, concession agreements, leases.
- Relevant scientific studies, inventories, and monitoring reports.

- Visitor use statistics, trends, studies, road counts, surveys.
- Regional map showing the location of other water recreation opportunities.
- Reports, studies, trends, or other materials from county, State, or Federal partners.
- List of important contacts (e.g., local, State, and Federal agencies; local communities; tourism offices; special interest groups; universities).

### **Define the geographic location or study area for the WROS inventory.**

While agencies have jurisdictional boundaries, the visiting public often enjoys multiple local, State, and Federal areas on a single visit. The public's "visitation range" is often larger than a single agency's jurisdiction, and includes adjacent lands and waters where visitors spend time traveling, recreating, or viewing. Thus, the question is how large should the study area be to make good management decisions on the lands and waters within a manager's jurisdiction?

A reasonable rule of thumb is to define the study area for the WROS inventory to include those lands and waters that may affect the quality of the water recreation opportunity. It might also be helpful to think from the perspective of the visitor: (1) What is the visitation range (i.e., analogous to a wildlife's home range) or area that most visitors also visit when they are visiting the general area? (2) Where do visitors go and what do they do beyond the primary water resource in question? (3) Are there land uses adjacent to or within the study area that may affect the recreation opportunities?

Detailed WROS inventory, planning, and management will only occur within the study area and within the jurisdiction of the managing agency. Yet, it may be necessary and beneficial to consider, particularly during WROS inventory and planning stages, the larger area of influence beyond the study area in order to help decide how to manage the recreation opportunities in the study area.

**Decide the level of resolution or appropriate scale of the base map.** In theory, one could conduct a WROS inventory on any size area (e.g., 50 square miles, 10,000 acres, 1 acre). The real question is what scale is practical, usable, and compatible with other resource inventories and accommodates a GIS interface.

A reasonable scale for WROS inventory mapping is a minimum of 160 acres, or 1/4 of a section; that is, a WROS zone should be at least 160 acres to be mapped as a separate and distinct WROS class. Furthermore, maps of a 1:50,000 scale have been found to be reasonable, although a 1:24,000 scale might be better for small study areas.

*The effective WROS area consists of those acres that are available and suitable for recreation purposes.*

A reasonable rule of thumb is that the minimum size or acreage for an area should be practical and useful for planning and management purposes and should be compatible with other inventory and mapping efforts.

**Decide the time period for applying WROS.** Water recreation opportunities and management direction change during the year because of weather, water uses, type and pattern of visitation, facility closures, water operations, personnel staffing, and many other factors. Thus, an important decision relates to the period of time to which WROS is being applied. It is reasonable to develop WROS inventory maps for the major recreation seasons, for the high and low water periods, or for periods when major changes are anticipated. A reasonable rule of thumb is that the time period will be defined by the important public concerns and management issues that are driving the analysis or planning process.

**Decide if WROS will be used in a resource management planning process.** The WROS inventory can be used either as input to a comprehensive resource management planning process or directly by managers to implement recreation management direction for the area. If the inventory will be used in a resource management planning process, it is important to anticipate and to be consistent with other criteria being used in the process (e.g., scale, planning horizon, public process, timetable, and level of analysis).

The WROS inventory will describe the type and location of current water recreation opportunities and identify inconsistencies that may be affecting the quality of the current opportunities. Thus, if a planning process is not to be implemented in the near future, WROS can directly and immediately help manage the current recreation situation by dealing with those inconsistencies of consequence or by changing the current situation to another desired water recreation opportunity.

**Determine the effective WROS area under consideration.** The effective WROS area consists of those acres that are available and suitable for recreation purposes. Identifying and demarking on the base map all the areas that are not suitable for recreational purposes is important early in the inventory process. For example, unsuitable lands and waters could include security areas, water storage and power facilities, private inholdings, municipal or industrial operations, commercial shipping or barge lanes, ecologically sensitive areas, public hazard areas, cultural and historic sites, wildlife nesting areas, shallows and wetlands, or locations that are undesirable because of smells, sounds, and views.



Water operation facilities and security areas often remove an area from recreation use.



Wildlife nesting areas and migration patterns should be considered in WROS.



Adjacent land uses need to be identified early in WROS.

The effective supply of recreation opportunities can change weekly (e.g., no commercial transport on weekends) or seasonally because of fish and wildlife migration, hunting seasons, facility closure, reservoir drawdown, weather, and many other factors.

**Identify any other important planning considerations that may affect WROS.** The application of WROS will be affected by other considerations in defining the scope. Examples include: What are the primary uses and commitments of the water resources? What are the major forces or interests driving the application of WROS at this time? What is the level of public concern or controversy? What is the timetable and schedule of major activities? How many person days and dollars are allocated to the effort? Who constitutes the WROS team and what is the responsibility of each member? Who is the decision maker or the responsible official? What criteria will be used to arrive at a decision? What is the planning horizon or the number of years into the future that should be targeted? What will be the nature of external collaboration with the visitors, community, private sector, and other stakeholders? What external experts will be used, if any, and what will be their role? What changes to the current water operations, recreation opportunities, adjacent land use, or other considerations are not reasonable or are beyond the scope of the planning effort?

**Develop a basic profile of the planning area.** Figure 11 is an example of a profile tool to assemble and record important recreation and water resource information useful in WROS.

**Figure 11. An Example of a Basic Water Resources Profile Tool**

**Name of Water**

**Resource:** \_\_\_\_\_ **County/State:** \_\_\_\_\_

**Managing Agency/Office:**

\_\_\_\_\_

**Estimate the average river flows (cfs) or water elevation for each season over the last 5 years:**

Spring: \_\_\_\_\_ Summer: \_\_\_\_\_ Winter: \_\_\_\_\_ Fall: \_\_\_\_\_

**River Flow, if applicable.**

**Current cubic feet per second:** \_\_\_\_\_

Check the item below that best describes the river flow.

\_\_\_\_\_ *Very high flow:* Very fast moving deep water, some very big rapids, water very high or over the banks, a few exposed large rocks

\_\_\_\_\_ *High flow:* Fast moving moderately deep water, many big rapids, water close to top of bank, a number of big exposed rocks

\_\_\_\_\_ *Medium flow:* Steady moving moderately deep water, many large exposed rocks in rapids, water slightly down from high water line

\_\_\_\_\_ *Low flow:* Slow moving water, many exposed rocks, river bottom exposed for a few feet out from the high water line

\_\_\_\_\_ *Very low flow:* Very slow moving shallow water, exposed mud flats, river rocks and bottom often exposed, water barely covering bottom in rapids, must choose floatable areas, bottom exposed for several feet out from high water shoreline

**Lake or Reservoir Elevation, if applicable.**

**Current water elevation:** \_\_\_\_\_

Check the item below that best describes the lake or reservoir.

\_\_\_\_\_ *Very high water:* Reservoir full to overfull. Some flooding occurring. Trees and bushes in the water. Water high on boat ramps. Water often muddy and carrying sticks and other debris.

\_\_\_\_\_ *High water:* Reservoir full to nearly full.

\_\_\_\_\_ *Medium water:* Reservoir below full. High water line exposed. Some sand bars and mud areas exposed.

\_\_\_\_\_ *Low water:* Lots of exposed shoreline area, mud flats, and sand bars. Some exposed rocks, stumps, and other hazards near the water surface. Trees and bushes that are submerged during very high water are now out of water. Water low on the boat ramps.

\_\_\_\_\_ *Very low water:* Lots of exposed shoreline, mudflats, rocks, and stumps. Water very low on the boat ramps. Sometimes ramps and docks are out of the water and unusable. Difficult, if not impossible, to get to the water from the shore. Sometimes coves are dry, and a good part of the reservoir bottom is dry with only a stream showing.

**Most Popular Recreation Activities by Season:**

SPRING

SUMMER

FALL

WINTER

1st. \_\_\_\_\_

2nd. \_\_\_\_\_

3rd. \_\_\_\_\_

4th. \_\_\_\_\_

**Figure 11 Continued. An Example of a Basic Water Resources Profile Tool**

**Total Annual Visitation**

Number of annual visitors: \_\_\_\_\_ Number of annual visitor days: \_\_\_\_\_

% of visitors who are day-users: \_\_\_\_\_ Average length of stay: \_\_\_\_\_

**Visitation Percentages by Season**

Spring: % of annual visitors \_\_\_\_\_ % of spring visitors who are day-users \_\_\_\_\_

Summer: % of annual visitors \_\_\_\_\_ % of summer visitors who are day-users \_\_\_\_\_

Fall: % of annual visitors \_\_\_\_\_ % of fall visitors who are day-users \_\_\_\_\_

Winter: % of annual visitors \_\_\_\_\_ % of winter visitors who are day-users \_\_\_\_\_

**Most Important Recreation-Related Management Concerns, Public Issues, or Opportunities (i.e., what? where? when? who? why? how?)**

1.

2.

3.

4.

5.

**Number (supply or capacity) of available overnight recreation sites (e.g., developed campsites, designated backcountry sites, rental cabins, hotel rooms, overnight houseboat rentals):**

Number of overnight accommodations: \_\_\_\_\_

**Average occupancy rate (%) for overnight recreation sites by season**

Spring: Weekdays (M–Th) occupancy rate: \_\_\_\_\_% occupied of total available  
Weekends (F–S) occupancy rate: \_\_\_\_\_% occupied of total available

Summer: Weekdays (M–Th) occupancy rate: \_\_\_\_\_% occupied of total available  
Weekends (F–S) occupancy rate: \_\_\_\_\_% occupied of total available

Fall: Weekdays (M–Th) occupancy rate: \_\_\_\_\_% occupied of total available  
Weekends (F–S) occupancy rate: \_\_\_\_\_% occupied of total available

Winter: Weekdays (M–Th) occupancy rate: \_\_\_\_\_% occupied of total available  
Weekends (F–S) occupancy rate: \_\_\_\_\_% occupied of total available

**Evaluator's Name:** \_\_\_\_\_ **Phone:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## The WROS Inventory Attributes and Protocol

The WROS inventory produces a map delineating the type and location of the current WROS classes; that is, a map that shows the current supply of available recreation opportunities. This section explains the WROS inventory protocol and the attributes used in the inventory and details the steps

necessary for a WROS inventory of the current situation.

As previously described in chapter 1, a recreation setting consists of physical, social, and managerial attributes that affect the quality or nature of the recreation experience (See figure 4.) Since it is not practical to inventory every possible setting attribute, WROS uses 15 attributes as the basis for delineating the type and location of the existing WROS classes. Five physical, six social, and four management attributes have been chosen because each can have a major influence on the type of recreation opportunity that is currently available. With due deliberation and justification, there also may be situations where managers add or delete attributes to the inventory protocol.

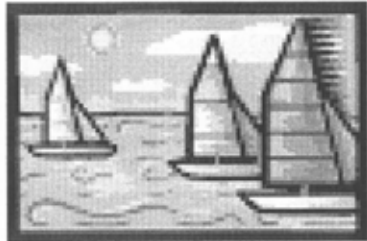
The inventory attributes are packaged into the WROS Inventory Protocol (Protocol). The Protocol is an inventory “booklet” completed by each trained person at each inventory site. Figure 12 depicts the front page of the Protocol. Inside the Protocol is a page for each of the physical, social, and

managerial attributes. Figures 13, 14, and 15 show the three pages in the Protocol, the 15 inventory attributes used to delineate the WROS class, and the scale of degree previously discussed in chapter 1. (Note that the scale of degree presented in figure 10 is reversed for two attributes and is replaced with a mileage measurement for the distance attribute.)

Figure 12. The WROS Inventory Protocol

# WROS Inventory Protocol

## Mapping the Supply of Recreation Opportunities



*Name of Water Resource:* \_\_\_\_\_ *Date:* \_\_\_\_\_

*Your Name and Title:* \_\_\_\_\_

*Inventory Site No:* \_\_\_\_\_ *Local Name:* \_\_\_\_\_

*GPS Coordinates:* \_\_\_\_\_

*Planning Period Under Consideration:* \_\_\_\_\_



**Figure 13. WROS Physical Inventory**

Physical attributes are features that are relatively permanent or fixed within the landscape and are not likely to change soon.

**Field Notes:**

*Circle the degree, extent, or magnitude that the following attributes are present at this site.*

<p><b>Degree of Development</b> Degree that dams, major bridges, marinas, parks, resorts, highways, or other municipal, industrial, or commercial structures are present.</p>	Extensive, dominant 80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Sense of Closeness to a Community</b> Degree that visitors sense that they are close to the sights, sounds, and smells typical of a community.</p>	Extensive, dominant 80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Degree of Natural Resource Modification</b> Degree that the visitors are aware that the natural resources have been altered by human activity, technology, or development.</p>	Extensive, dominant 80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Distance from Development on or Adjacent to the Water Resource</b> Mileage from dams, major bridges, marinas, resorts, or other municipal, industrial, commercial, or residential areas.</p>	Less than 0.5 mile	0.5-2 Miles	2-5 Miles	5-8 Miles	8-10 Miles	More than 10 miles					
<p><b>Degree that Natural Ambiance Dominates the Area.</b> Degree that there is a sense of tranquility and opportunity to see, hear, and smell nature.</p>	Very minor, very little, or rare 0-3%	Minor, little, or seldom 3-10%	Occasional, infrequent, or periodic 10-20%	Prevalent, common, or apparent 20-50%	Very prevalent or widespread 50-80%	Extensive, dominant 80-100%					
<p>Circle the number that best represents your overall judgment of the area. Scores with one decimal point such as 5.5 are acceptable.</p>	1 <b>Urban</b>	2 <b>Suburban</b>	3 <b>Rural Developed</b>	4 <b>Rural Developed</b>	5 <b>Rural Developed</b>	6 <b>Rural Developed</b>	7 <b>Rural Natural</b>	8 <b>Rural Natural</b>	9 <b>Semi Primitive</b>	10 <b>Semi Primitive</b>	11 <b>Primitive</b>

**Figure 14. WROS Social Inventory**

Social attributes are features associated with visitor’s activities, behaviors, and perceptions of the area.

**Field Notes:**

*Circle the degree, extent, or magnitude that the following attributes are present at this site.*

<p><b>Degree of Visitor Presence</b> Degree that the sights, sounds, and smells of other visitors, their equipment, their impacts, or litter are present.</p>	Extensive, dominant 80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Degree of Visitor Concentration</b> Degree that visitors congregate on the shore or water in the area (e.g., coves, launches, swim areas, good fishing spots, camp areas).</p>	Extensive, dominant 80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Degree of Recreation Diversity</b> Degree that there is a mixture of recreation activities being participated in or equipment being used.</p>	Extensive, dominant 80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Degree of Visitor Comforts</b> Degree that visitors know that conveniences, comforts, safety, and security are nearby.</p>	Extensive, dominant 80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Degree of Solitude and Remoteness</b> Degree that visitors view themselves as being alone and far away from civilization in a wild and remote place.</p>	Very minor, very little, or rare 0-3%	Minor, little, or seldom 3-10%	Occasional, infrequent, or periodic 10-20%	Prevalent, common, or apparent 20-50%	Very prevalent or widespread 50-80%	Extensive, dominant 80-100%					
<p><b>Degree of Non-Recreational Use, if Any</b> Degree that the sights, sounds, and smells of non-recreational use and users are present (i.e., activities associated with commerce, work places, industry, roads, airplanes, agriculture, or communications).</p>	Extensive, dominant 80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p>Circle the number that best represents your overall judgment of the area. Scores with one decimal point such as 5.5 are acceptable.</p>	<b>1</b> <b>Urban</b>	<b>2</b>	<b>3</b> <b>Suburban</b>	<b>4</b>	<b>5</b> <b>Rural Developed</b>	<b>6</b>	<b>7</b> <b>Rural Natural</b>	<b>8</b>	<b>9</b> <b>Semi Primitive</b>	<b>10</b>	<b>11</b> <b>Primitive</b>

**Figure 15. WROS Management Inventory**

Management attributes are those features that are provided for, managed, and can be changed by the managing agency or its partners.

**Field Notes:**

*Circle the degree, extent, or magnitude that the following attributes are present at this site.*

<p><b>Degree of Management Presence</b> Degree that management personnel, boat patrols, signage, equipment, beacons, water markers, buoys, entry stations, wakeless zones, closures, speed zones, regulations, security lighting, administrative offices and compounds, or interpretive programs are present.</p>	Extensive, dominant  80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Degree of Public Access</b> Degree that developed access facilities are present such as boat ramps, paved roads and trails, or swim beaches.</p>	Extensive, dominant  80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Degree of Developed Recreation Facilities and Sites</b> Degree that developed campgrounds, pump stations, paved parking, amphitheaters, picnic sites, play areas, nature trails, flush toilets, showers, docks, piers, visitor centers, marinas, or resorts are present.</p>	Extensive, dominant  80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p><b>Degree of Visitor Services and Conveniences</b> Degree that restaurants, fuel, boat rentals, guide services, food stores, medical services, utilities, lighting, telephones, or fax machines are within a few miles.</p>	Extensive, dominant  80-100%	Very prevalent or widespread 50-80%	Prevalent, common, or apparent 20-50%	Occasional, infrequent, or periodic 10-20%	Minor, little, or seldom 3-10%	Very minor, very little, or rare 0-3%					
<p>Circle the number that best represents your overall judgment of the area. Scores with one decimal point such as 5.5 are acceptable.</p>	<b>1</b>	2	<b>3</b>	4	<b>5</b>	6	7	8	<b>9</b>	10	<b>11</b>
	<b>Urban</b>	<b>Suburban</b>		<b>Rural Developed</b>		<b>Rural Natural</b>		<b>Semi Primitive</b>		<b>Primitive</b>	



Using collaborative expert opinions to conduct an inventory.



Team members evaluating the setting.



The team needs to prepare for the WROS inventory.

## Mapping the Current Supply of Recreation Opportunities

Mapping the current supply of recreation opportunities in the study area means determining what WROS class or classes the area is currently supplying. The following steps are recommended for Levels 2 and 3 WROS analysis. (See figure 9 in chapter 1.) Level 1 analysis is typically conducted in the office by a recreation staff person, and many of these steps do not apply.

1. Assemble a small core team (i.e., four to six members) of experienced professionals representing different staff functions (e.g., recreation management, natural and cultural resources, maintenance, law enforcement, or interpretation). These members would probably be the agency experts most familiar with the recreation phenomena over the years. Having several professionals from another area, agency, or private firm that have had experience with applying WROS is highly recommended. Because the purpose of the inventory is to describe and map the nature of the current recreation opportunities, there may be an advantage to having several local and long-term recreation users participate. The total team might range in size from 6 to 12 members for a Level 2 or 3 WROS analysis.
2. Introduce the team to the planning area, base map, WROS system, time of year under consideration, and the inventory protocol used for mapping the supply of current recreation opportunities. Thorough understanding of the descriptions of the recreation experiences for each WROS class (see figures 6 and 7 in chapter 1) is important early in the process, particularly for those inexperienced with WROS. The *WROS Users' Guidebook* would be a valuable training tool.
3. Once familiar with WROS, the team should prepare for the field inventory. The field inventory requires accessing a boat large enough for the team to experience the inventory sites and comfortably discuss their observations and ratings. Pontoons, patio boats, and houseboats work well for this task. While maps, air photos, reports, GIS analyses, and other office information are very helpful for Level 1 analysis, they are not sufficient for level 2 and 3 WROS mapping. It is vital that the team literally “experience” the recreation phenomenon and ambiance (e.g., sights, sounds, and smells) of the inventory setting.

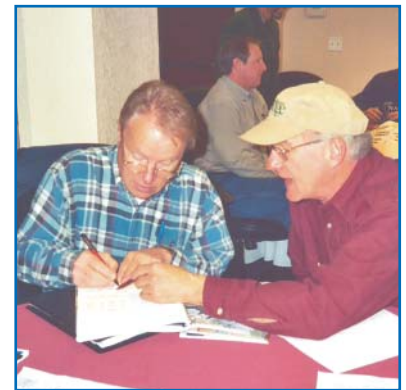
4. The field inventory typically begins in the vicinity of the most highly developed portion of the water resource (e.g., marina, subdivision, industrial activity, or developed park complex).
5. At each inventory site, the boat should be stopped, the engine turned off, and the team should take a few minutes to “experience” the setting. After a few minutes, the team members familiar with the location have a chance to present their views of the type and nature of the recreation use for the planning period in question (e.g., describe how, when, and why recreationists use the area, and the type and amount of management, and who the recreationists are). Team members can ask questions or offer information that might be important.

It is also important for the team to have a common understanding of the area under consideration at the inventory site. For example, the inventory site might include the water and land resources within a 2-mile radius of the boat or the area within the cove or the area within the viewshed. It is also important to remind the team of the period that is under consideration (e.g., weekend, May, summer).

6. Each team member is provided a copy of the WROS Inventory Protocol. The attributes listed on the left side of the Protocol are considered the important characteristics of the setting. Each rater is asked to *circle the degree, extent, or magnitude that the following attributes are present at this site*. To the right of each attribute is the scale of degree previously discussed in chapter 1 and displayed in figure 10.

There will be instances when a listed attribute is not considered relevant or when some other attribute should be added for consideration. As described in chapter 1, WROS is flexible and operates on the standards of the rule of reasonableness and sound professional judgment.

7. Working individually, each rater completes the WROS physical inventory page in the Protocol (see figure 13) by considering each attribute in the left column and then circling or checking the cell that best describes the attribute’s presence at that site. Note that, on the physical inventory, the *distance from development* attribute is measured in miles, and the *degree of natural ambiance* reverses the scale of degree from *very minor* on the left to *dominant* on the right.



Each rater evaluates the recreation setting.



Long time lake users can help in the inventory.

After each attribute is checked or circled on the scale of degree, each rater is asked at the bottom of the page to *circle the number which best represents your overall judgment of the area*. Each person individually circles a number, ranging from 1 to 11, that best represents his or her overall judgment of the WROS class at the inventory site. The odd numbers represent the six WROS classes, while the even numbers represent the mid-point between two WROS classes.



Local groups know a great deal about the lakes recreation use. They are experts to be included in the WROS inventory.

This decision should be based on the sound professional judgment of the raters, preponderance of the evidence, and how the attributes were circled in the cells above. There is no formula or mathematical calculation to arrive at this overall judgment for the area.

8. After all raters complete their physical inventory, a “straw” vote is taken and each person states the overall number at the bottom. After all raters have a chance to express what factors influenced their scores, a second straw vote is taken and duly recorded on a master form. Typically, the results of the second vote (i.e., the overall numbers expressed after some discussion) will converge and there will be team consensus. Recording the average score to one decimal point is acceptable.

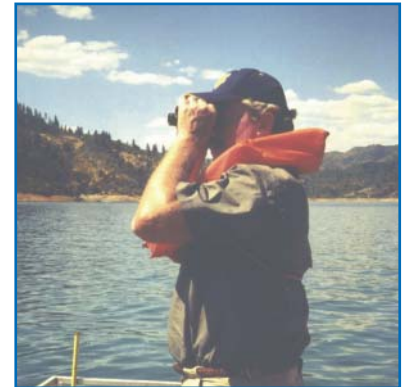
In cases where there is significant divergence, more discussion is advised until team consensus is approached. In some cases, it may be helpful to dismiss the two extreme outliers or revisit the inventory site after the other sites on the water resource have been inventoried or make a final decision after more information is made available back in the office.

9. It is important for the team leader to keep asking the team *which of the six WROS recreation experiences best describes the type of experience a visitor is being provided at this location?* It is important during the inventory process, particularly for those inexperienced with WROS, to periodically reread the descriptions of the recreation experiences for each WROS class. (See figures 6 and 7 in chapter 1.)
10. The process used for completing the physical inventory is repeated for the social and managerial inventory (see figures 14 and 15) contained within the protocol.

11. The results of these efforts are three numbers for each inventory site; that is, a number from 1 to 11 for the physical setting, social setting, and managerial setting. These numbers are recorded on a master map that is maintained during the field inventory, and the team forms are collected and filed for the administrative record.

The first site inventoried may take 30 to 45 minutes with inexperienced people. The time at each subsequent inventory site will shorten to perhaps 15 minutes after a half-dozen trials by the team. The first three or four inventory sites should be viewed as practice tests or trials. Thus, it is advisable to return to these sites after the entire water resource has been surveyed to see if adjustments would be appropriate.

12. After the initial site inventory is complete, the team travels by boat to the next inventory site. Two strategies have worked well. One, the next inventory site can be chosen when there is an apparent change in the physical, social, or management attributes of the setting or when the team has traveled a significant distance (e.g., several miles) from the previous site. Two, the next inventory site might be the location with the least development (compared to the first inventory site) and in the most remote part of the water resource. This allows the team to get a sense for the WROS diversity in the study area, although the logistics of travel and time may not be reasonable.
13. If there are very popular shoreline locations (e.g., campgrounds, swimming beaches) or very popular islands, it may be helpful to do a site inventory from land. Also, on a very large water resource (e.g., 100-mile-long study area), it may be decided to do initial WROS inventories every 5 or 10 miles, while recognizing that a more detailed or finer-level inventory might be necessary for parts of the body of the water resource on a follow-up trip.
14. The final results of the field inventory include (1) a working map of the study area that identifies the inventory sites, (2) the team's overall ratings from 1 to 11 for the physical, social, and managerial inventories, and (3) a file of the completed protocols for the administrative record.



Above, it is important to inventory on the water.

Below, WROS engages stakeholders to ensure better decisions.

15. This typically concludes the work of the WROS inventory team created in step 1 of this section, although some or all of the participants may remain involved in other aspects of WROS. At this point, the responsible recreation staff person needs to (1) delineate the current overall WROS classes and (2) identify and prioritize inconsistencies that may exist in the current situation. These two considerations are discussed in the following sections, and examples are provided of the final WROS maps depicting the type and location of the current recreation situation.

## Delineation of Current Overall WROS Class

At this point in the WROS inventory, each inventory site has an agreed-upon team rating for its physical, social, and managerial attributes. Figure 16 is an example of how each inventory site and its ratings can be displayed. The next step is for the expert team to use sound professional judgment in aggregating the three attribute ratings to make an overall judgment as to which WROS class best represents the current situation or the supply of recreation opportunities. There will be instances when the physical, social, and managerial WROS ratings are the same (e.g., inventory site 1). More often, particularly when WROS is first applied, the ratings will be different (e.g.,

**Figure 16. A Tool for Displaying the Setting Attribute Ratings and Overall WROS Classification**

Inventory Sites	Setting Attribute Ratings			WROS Classification
	Physical	Social	Managerial	
1. Auk's Resort	3.0	3.0	3.0	Suburban (S3)
2. Haas's Houseboats	5.3	4.5	4.0	Rural Developed (RD5)
3. Lovejoy's Landing	6.1	5.7	5.1	Rural Developed (RD6)
4. Welch's Hunting Camp	10.2	9.3	8.2	Semi Primitive (SP9)



inventory sites 2, 3, and 4). When two or three of the setting attribute ratings at a site are similar, the decision about the overall WROS classification is relatively easy to make. It is more difficult to decide the overall WROS classification if the physical, social, and managerial classifications at a site differ considerably (e.g., inventory site 4).

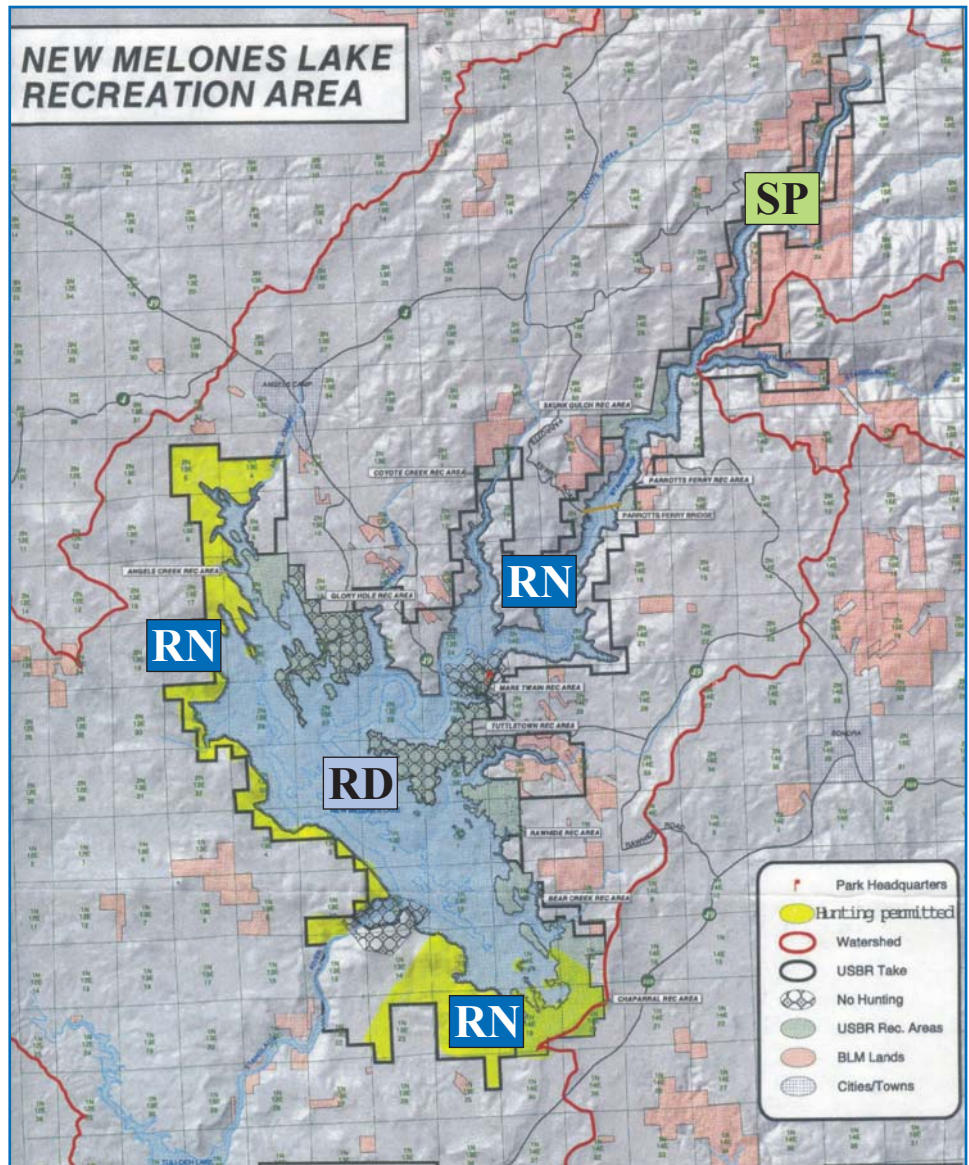
In instances where there are differences among the setting attribute ratings, the 11-point scale in the Inventory Protocol offers a major advantage. An 11-point scale allows for a finer level of assessment than a 6-point scale and identifies areas where there are transitions, gradations, or “leanings” towards one WROS class versus another. It allows for a higher level of accuracy during the inventory stage and helps managers to consider alternative ways to manage the area in the future. In effect, an 11-point scale gives the expert team the option to indicate up to 16 gradations of recreation opportunities, depicted as follows.

WROS INVENTORY SCALE															
<b>1</b>	2	<b>3</b>	4	<b>5</b>	6	<b>7</b>	8	<b>9</b>	10	<b>11</b>					
<b>U</b>		<b>S</b>		<b>RD</b>		<b>RN</b>		<b>SP</b>		<b>P</b>					
<b>U1</b>	U2	S2	<b>S3</b>	S4	RD4	<b>RD5</b>	RD6	RN6	<b>RN7</b>	RN8	SP8	<b>SP9</b>	SP10	P10	<b>P11</b>

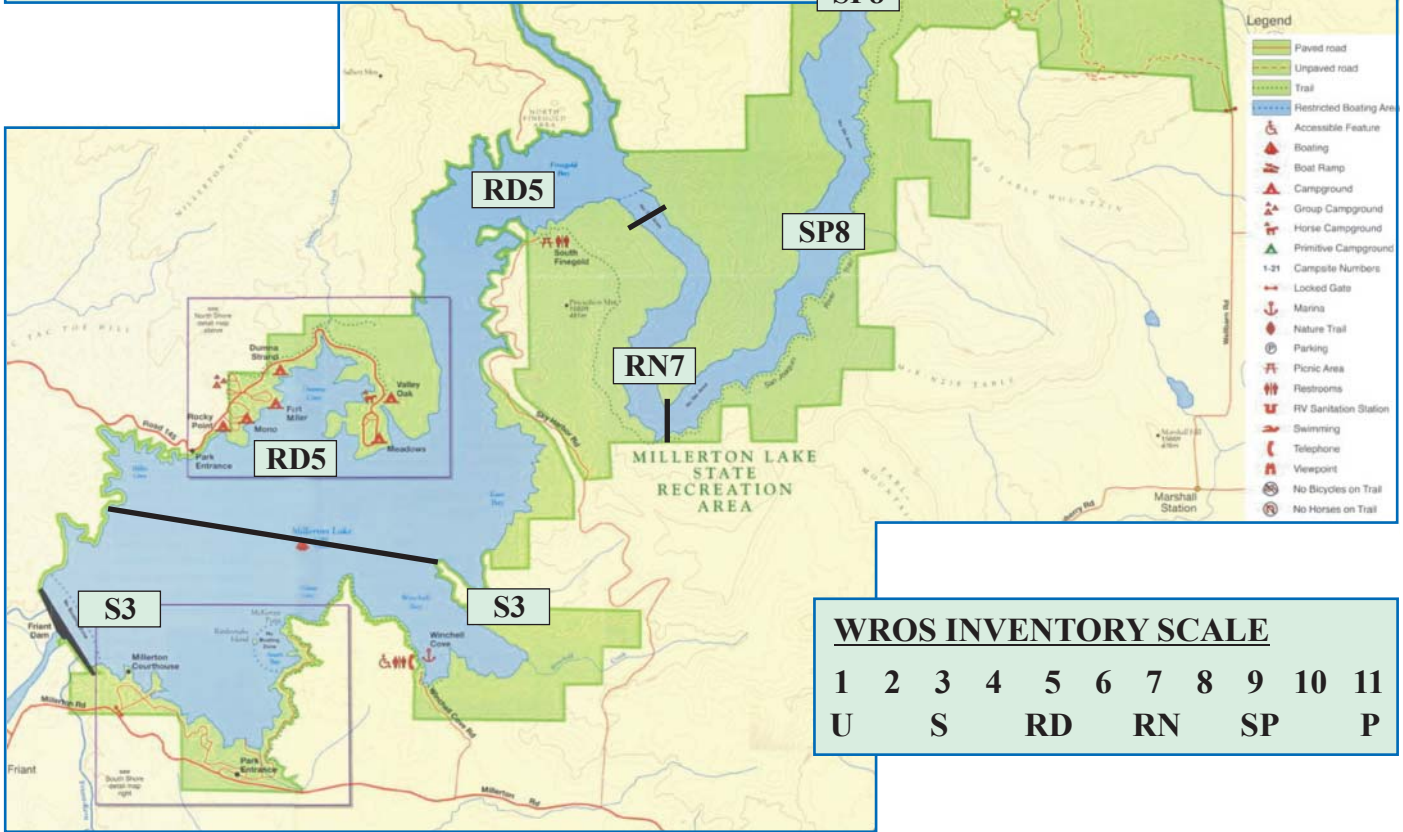
The six primary WROS classes are U1, S3, RD5, RN7, SP9, and P11. The other ratings reflect a transition or leaning between two primary WROS classes. For example, RD6 is a score to the right of the primary rural developed WROS class (RD5), suggesting that there are some attributes in this area that are more typical of a rural natural setting that pull the overall rating from RD5 to RD6. Likewise, RN6 indicates that there are some attributes at the site that are more typical of a rural developed WROS class and these attributes pull the overall rating from the primary rural natural WROS class of RN7 to RN6.

A major advantage of using an 11-point scale in the inventory stage is that it conveys more detail and suggests the feasibility of altering the management of an area from one WROS class to another. Depending on the rating for an area (e.g., RN6, RN7, or RN8), the greater the probability that a small shift in one or more of the physical, social, or managerial attributes will cause a shift in the WROS class.

The following four maps illustrate how the overall WROS classes can be depicted and show the type and location of water recreation opportunities currently available. The New Melones map is the most basic and uses the initials of the six WROS classes, while the Lake Shasta, Millerton Lake, and San Luis maps show a finer level of detail and how the six WROS classes can be subdivided for purposes of the WROS inventory.



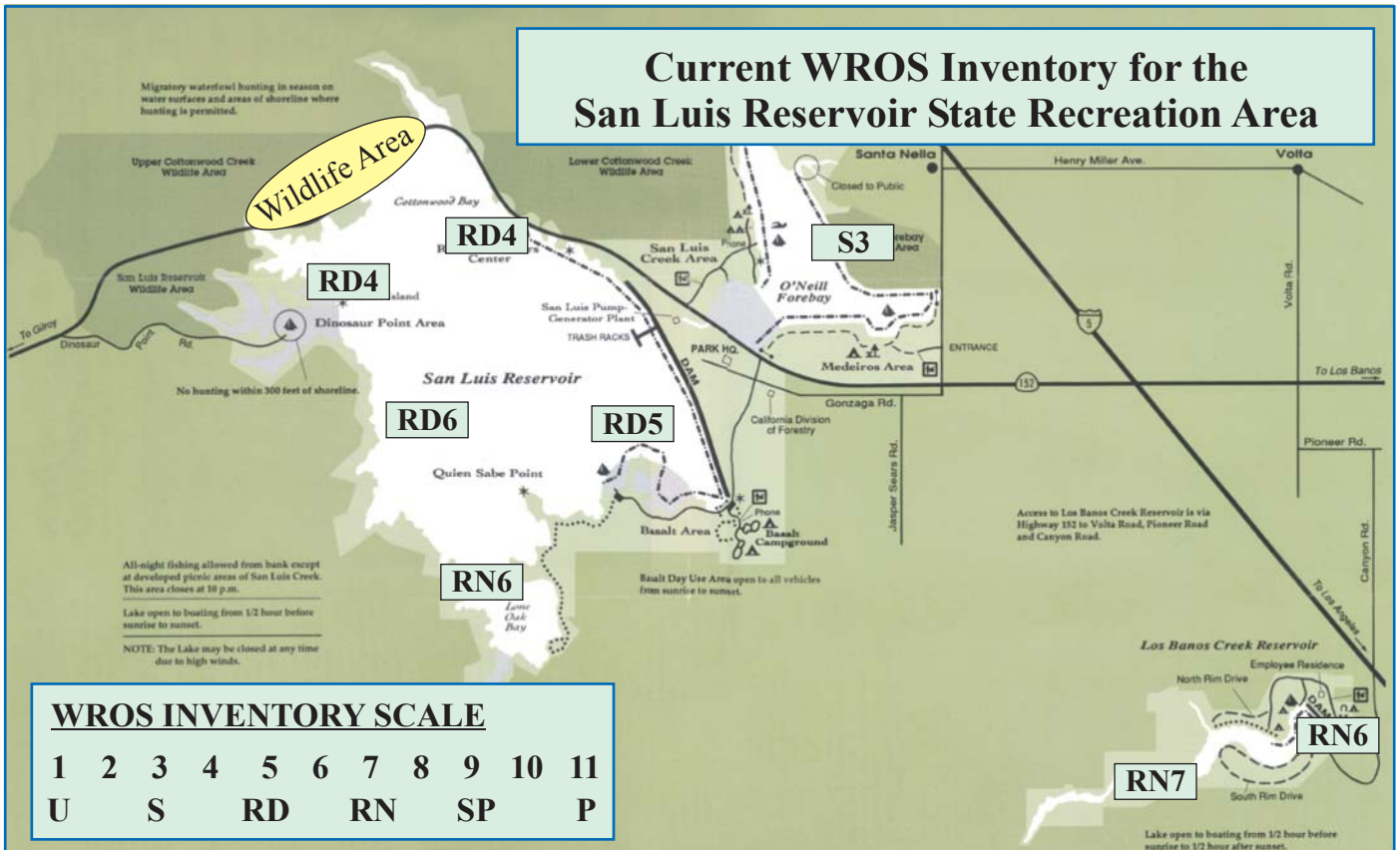
# Current WROS Inventory and Management Alternative #1 for the Millerton Lake State Recreation Area



**WROS INVENTORY SCALE**

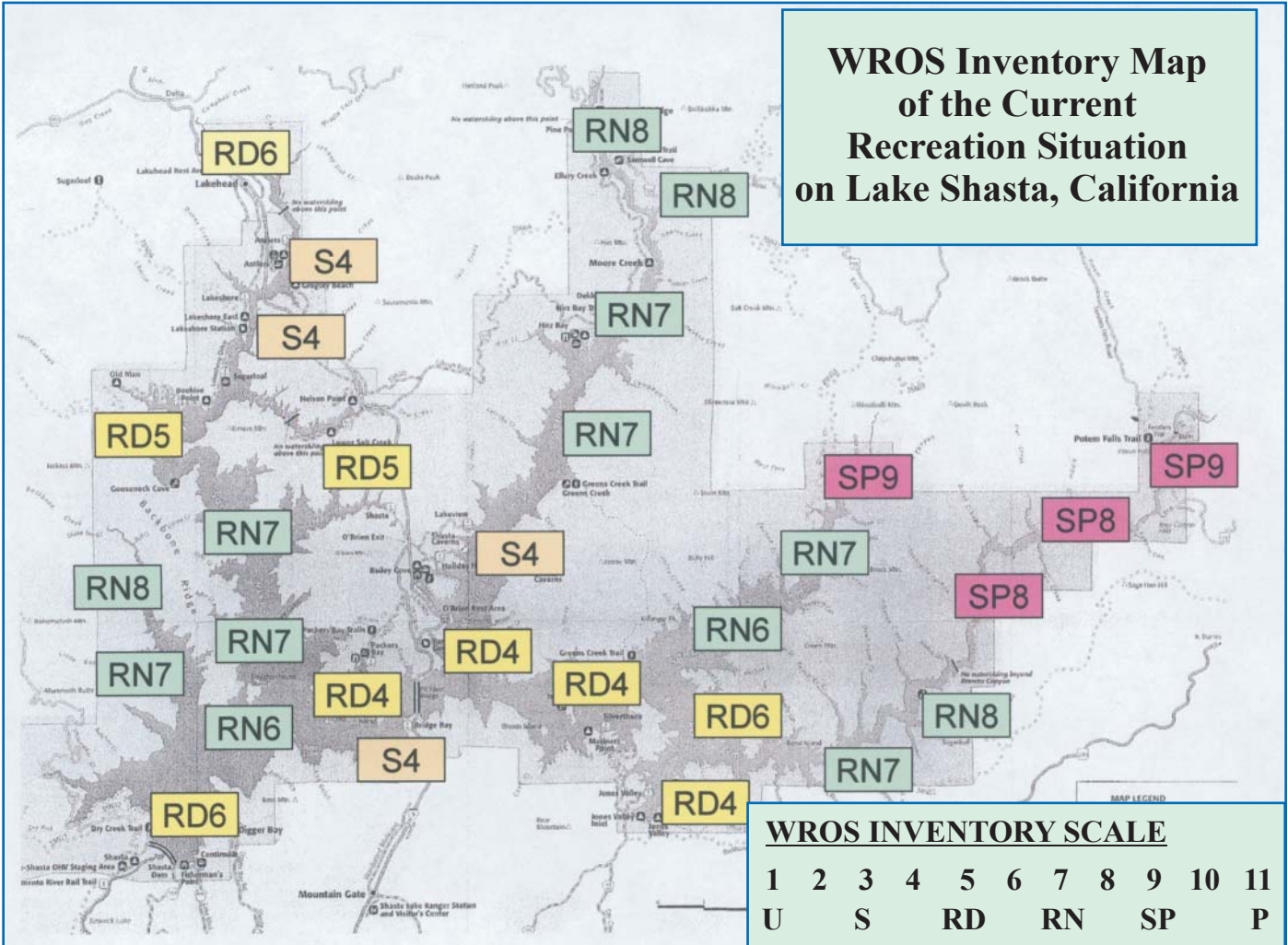
1	2	3	4	5	6	7	8	9	10	11
U	S	RD	RN	SP	P					

# Current WROS Inventory for the San Luis Reservoir State Recreation Area



**WROS INVENTORY SCALE**

1	2	3	4	5	6	7	8	9	10	11
U	S	RD	RN	SP	P					



## Inconsistency Mitigation

An inconsistency is a situation where the physical, social, and managerial ratings are different (e.g., sites 2, 3, and 4 of figure 16); that is, where the physical, social, and managerial attributes are not aligned or are not consistent. For example, the physical and social attributes might depict a rural developed WROS class, yet the lack of management signage, facilities, and patrols might be more consistent with a primitive WROS class. Another example might be weekends in June when the social attributes depict a suburban WROS class (e.g., large numbers of diverse recreationists), while the physical and managerial attributes depict a rural natural WROS class. A final

example is an area where the physical and social attributes depict a semi primitive WROS class, but the managerial attributes (e.g., floating toilets and flashing strobe safety lights) depict a rural developed WROS class. Depending on the inconsistency, mitigation might be necessary or desired.

Mitigation might involve a change in current management actions to eliminate inconsistencies and improve the recreation experiences being provided. The guidelines in *Chapter 4: WROS Management* can assist managers in both identifying and mitigating inconsistencies.

Figure 17 depicts an inconsistency mitigation tool with two dimensions: (1) the degree of impact and (2) the degree of reasonableness to mitigate. There may be situations where inconsistencies have a high impact on the intended water recreation opportunity, yet there is no reasonable way to mitigate (e.g., major highways, commercial shipping, holiday weekends). Alternatively, there are inconsistencies with high impact that can be easily mitigated (e.g., remove unnecessary buoys, restoration of eroded campsites, or institute a speed limit). Figure 17 is a tool to help sort the inconsistencies by their relative degree of impact or consequence, to assess the ability of management to mitigate, and to develop a prioritization scheme.

The output of inconsistency mitigation is a list, and perhaps a map, that identifies the type, location, and degree of inconsistencies. Those inconsistencies with a high degree of severity, extent, or consequence and a

**Figure 17. A WROS Inconsistency Mitigation Tool**

Degree of impact or inconsistency				
Degree of reasonableness to mitigate	Negligible	Minor	Moderate	High
None				
Low			<i>Priority D</i>	<i>Priority C</i>
Moderate			<i>Priority C</i>	<i>Priority B</i>
High			<i>Priority B</i>	<i>Priority A</i>

high degree of reasonable mitigation should be given the highest priority (i.e., Priority A) of attention by management. Guidance on how to mitigate inconsistencies and to align the setting attributes is provided in *Chapter 4: WROS Management*.



Maps and photos are important tools in the inventory process.

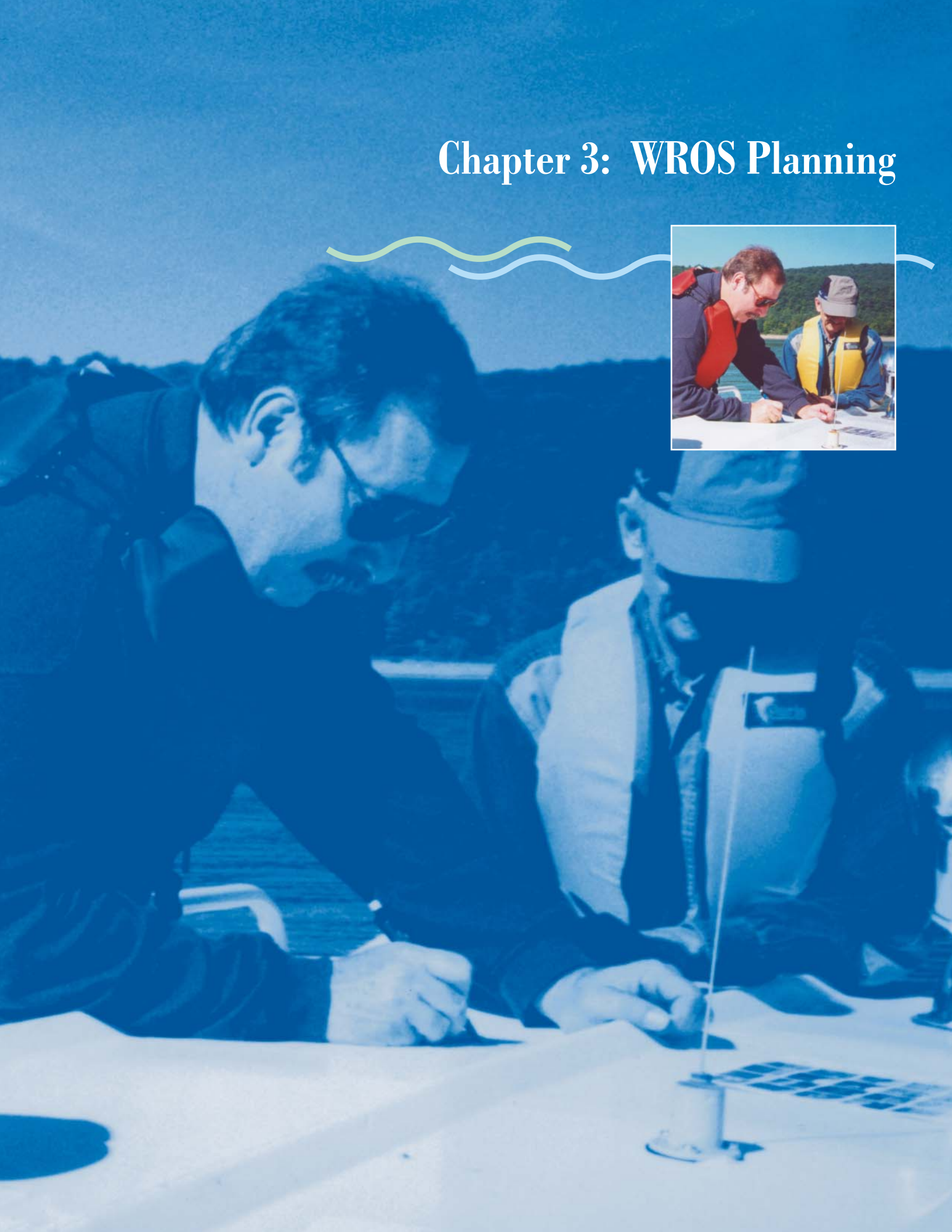
This concludes the WROS inventory stage. From here, the user of this guidebook has two options.

One, if there is no formal planning process underway or anticipated in the near future, the manager can take the WROS inventory information, proceed to *Chapter 4: WROS Management*, and begin to implement its direction. For example, inconsistencies can be mitigated, visitor maps and brochures can be improved to show the type and location of WROS classes,

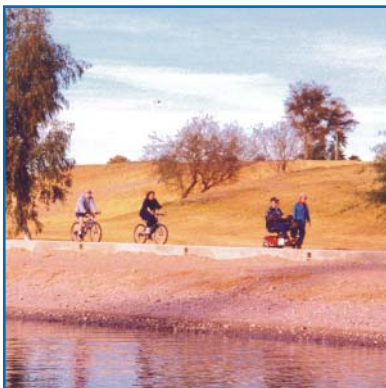
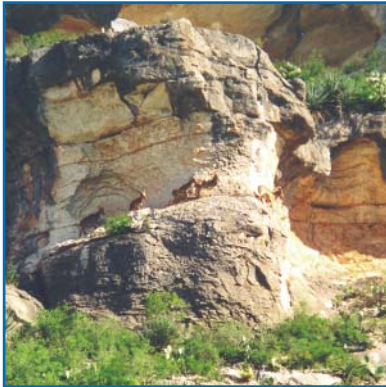
rules and regulations can be explained to the public more clearly as to why certain actions are desirable to protect the integrity of certain recreation opportunities, local residents and special interest groups can be advised of the increased clarity in management direction, a monitoring program can be initiated, the WROS classes can be added to a geographic information system, tourism welcome centers and web sites can more clearly inform the prospective visitor as to what recreation opportunities are available, and the WROS guidelines can be used to develop and justify an annual operating plan and budget. Note that if the proposed changes in management are considered major and significant, a NEPA-compliant planning process would be necessary.

Two, if there is a planning process underway or anticipated in the near future, the manager can take the WROS inventory information, proceed to *Chapter 3: WROS Planning*, and begin to integrate the inventory information to describe the current situation.

# Chapter 3: WROS Planning



# WROS Planning



Above, wildlife resources are often significant public issues and attractions on or near water.

Below, accessibility is often a significant public issue.

WROS is not a special or unique planning process. WROS is a tool that helps bring water recreation considerations into a comprehensive and integrated planning process. Metaphorically, WROS is like a tree branch that connects to the main stem or trunk of the tree; that is, WROS is one of many inventory tools that feed into an agency planning process. Reclamation, along with all local, State, and Federal land and water agencies, has regulations and procedures describing in detail each step of its planning process. This chapter discusses how WROS integrates with and supplements the key steps of a public recreation or resource planning process.

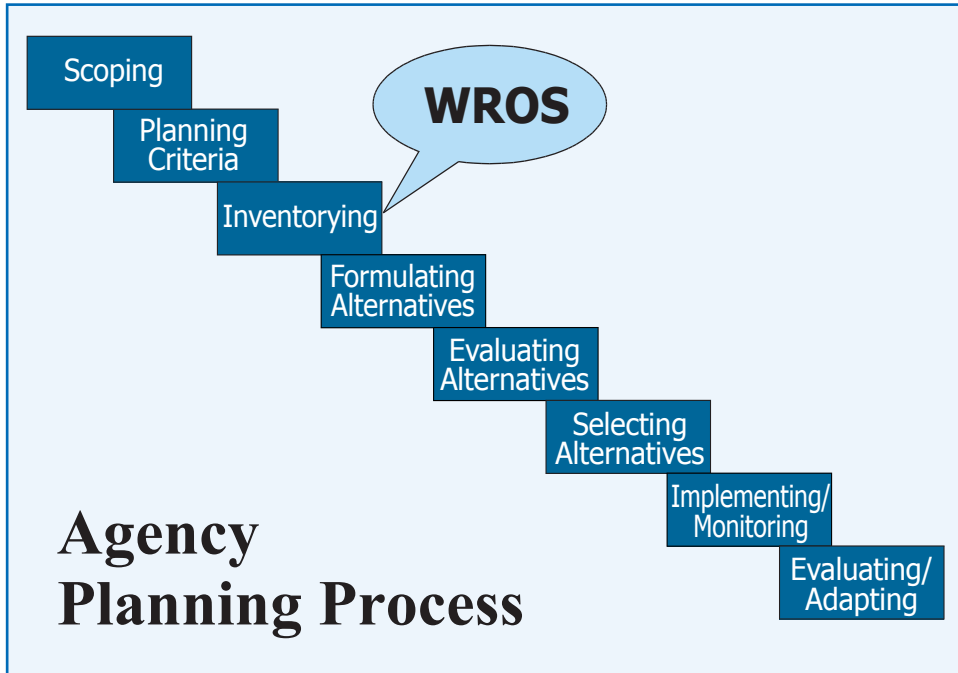
## Scoping

- Identify significant recreation-related public issues, management concerns, opportunities, and constraints.
- Identify recreation stakeholders and develop a plan for collaboration.
- Assess quality and quantity of best available recreation-related science and monitoring information.
- Identify those areas or times unsuitable for recreation use.

## Planning Criteria

- Compile 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 decision making).
- Define planning area, time horizon, available resources, procedural steps, and responsibilities.
- Develop a working base map, determine an appropriate scale of analysis, assess GIS capabilities, and secure current air photos.
- Select the decision criteria to be used to evaluate alternatives and assess recreational tradeoffs.
- Identify other administrative units or projects (comparables or analogs) that have similar recreation situations, uses, and patterns.





## Inventorying

- Integrate inventory maps depicting the overall current WROS classifications for the study area and all associated information in the development of WROS inventory. (See *Chapter 2: WROS Inventory* in this guidebook.)
- Develop WROS GIS overlays, if possible, that are compatible with other GIS overlays (e.g., vegetation, recreation facilities, roads, wildlife habitat, topography, private land, and heritage resources).
- Identify current and future recreation demand. Measuring the demand for any public good or service is both an art and a science. It involves identifying current use and users in the study area, their use locations, type of activity, duration, travel patterns, origins, participation percentages, and quality of recreation opportunities. It may also involve asking (i.e., using social surveys) what the public in the local or regional area would like to have available that is not currently available.

Figures 18 and 19 depict several dimensions of measuring recreation demand: who, what, and how.

**Figure 18. A Recreation Demand Measurement Matrix**

<b>What to Measure?</b>				
<b>Who to Measure?</b>	Preferred Recreation Activities	Preferred Recreation Settings	Preferred Recreation Experiences	Preferred Recreation Benefits
Current Visitors				
Local Community Residents and Stakeholders				
Regional Residents and Stakeholders				

- Many local, State, and Federal agencies are challenged to measure recreation and tourism demand. Thus, it would be helpful to examine a variety of information sources such as:
  - ◆ The Statewide Comprehensive Outdoor Recreation Plans (SCORPs) developed by each State park agency to secure Land and Water Conservation Fund monies
  - ◆ The National Survey on Recreation and the Environment (NSRE) managed by the U.S. Forest Service’s Southeast Forest Experiment Station ([www.srs.fs.fed.us/trends](http://www.srs.fs.fed.us/trends))
  - ◆ The U.S. Fish and Wildlife Service’s hunting, fishing, and watchable wildlife participation database
  - ◆ State and county tourism reports of visitation and economic impacts
  - ◆ Other public agency plans, studies, and visitation counts
  - ◆ County land use or recreation master plans
  - ◆ Special studies by various outdoor recreation groups and special interest groups (e.g., Ducks Unlimited, Trout Unlimited, Bass Anglers Association, American Recreation Coalition, American Canoe Association, Sporting Goods Manufacturing Association, and Outdoor Industry Association)
  - ◆ University and agency research publications

**Figure 19. Measuring Recreation Demand Involves Different Types of Tools**

Types of Recreation Demand Variables to Measure	Primary Tools	Secondary Tools
<p><u>Recreation Behaviors</u></p> <ul style="list-style-type: none"> <li>• What activities do visitors participate in and when, where, and for how long?</li> <li>• What settings do people visit and when, where, for how long, and for what activities?</li> <li>• What are the characteristics of the visiting groups (e.g., size, age structure, family or friends, type of equipment, favorite locations)?</li> </ul>	<ul style="list-style-type: none"> <li>• Road/trail counters and turnstiles</li> <li>• Cameras and videos</li> <li>• Air photos</li> <li>• Registrations and reservations</li> <li>• Field ranger observation logs</li> <li>• Volunteer host logs</li> <li>• Rentals, purchases, leases</li> <li>• Visitor diaries</li> <li>• Questionnaires, interviews, focus groups, open houses</li> </ul>	<ul style="list-style-type: none"> <li>• National, State, or community surveys</li> <li>• Maintenance and law enforcement reports</li> <li>• Local or State traffic counts</li> <li>• Local sales and taxes on related recreation goods and services</li> <li>• Local or State tourism visitation data</li> <li>• Observations by residents, long-time visitors, business people, and stakeholders</li> </ul>
<p><u>Public Preferences</u></p> <ul style="list-style-type: none"> <li>• What are the most preferred recreation opportunities?</li> <li>• What are the preferences among currently available recreation opportunities?</li> <li>• What is the importance of the natural and cultural resources in the area (e.g., wildlife, fish, history)?</li> <li>• What are the future trends?</li> <li>• What is the economic value of the recreation opportunities?</li> <li>• What are the reasons for not visiting the area?</li> <li>• How did the visitor learn about the area (i.e., information sources)?</li> </ul>	<ul style="list-style-type: none"> <li>• Mail questionnaires</li> <li>• On-site questionnaires</li> <li>• On-site interviews</li> <li>• Telephone interviews</li> <li>• Focus groups</li> <li>• Public open houses</li> <li>• Suggestion boxes</li> <li>• Field ranger observation and conversation logs</li> <li>• Comment cards</li> <li>• Expert panels</li> </ul>	<ul style="list-style-type: none"> <li>• National, State, and county surveys</li> <li>• Letters, editorials, and conversation logs</li> <li>• Other local, State, or Federal plans or impact statements</li> <li>• Newspaper surveys</li> </ul>

- Identify current and anticipated non-recreational use and users in the study area, location, duration, type of effect, and anticipated changes. County records on taxes, building permits, development plans, land use zoning, commerce trends, and other local and State reports can be helpful.
- Inventory all human-built structures (recreation and nonrecreation), infrastructure, services, programs, personnel, budgets, partners, and expected operational changes.
- Assess the regional recreation supply of water recreation opportunities including those provided by other agencies and the private sector within the “visitation” region. Figure 20 illustrates how the regional supply of opportunities can be depicted.
- Compare current resource and social conditions with the desired quality standards and map locations of known or likely impairment.

**Figure 20. A Hypothetical Comparison of Reservoirs Based on the Percent of Water Surface Acres by WROS Class**

<b>Regional Lakes</b> (surface acres/ shoreline miles)	<b>Urban</b> (%)	<b>Suburban</b> (%)	<b>Rural Developed</b> (%)	<b>Rural Natural</b> (%)	<b>Semi Primitive</b> (%)	<b>Primitive</b> (%)
Folsom (11,400/75)	0	20	70	10	0	0
Pardee (2,257/37)	0	0	30	60	10	0
Comanche (7,700/53)	0	0	75	25	0	0
New Hogan (4,400/50)	0	0	60	40	0	0
Tulloch (1,260/31)	0	80	20	0	0	0
Don Pedro (12,960/160)	0	0	50	50	0	0
Lake McClure (7,400/80)	0	0	70	30	0	0
Millerton (4,900/51)	0	10	60	20	10	0
<b>Gross Averages</b>	<b>0</b>	<b>10</b>	<b>57</b>	<b>32</b>	<b>2</b>	<b>0</b>

## Formulating Alternatives

- The WROS map generated in the WROS inventory depicts alternative 1, or the current recreation management situation, often referred to as the “no action” or “no change” alternative.
- For each additional alternative considered in the planning process, a revised WROS map is generated to depict change from the current situation.
- A matrix is developed to understand key differences and to ensure consideration of a reasonable range of alternatives. Figures 21, 22, and 23 provide examples of how WROS can be used to help create a reasonable range of alternatives and also how to display and evaluate alternatives.

## Evaluating Alternatives

- Figures 21, 22, and 23 are examples of how WROS can be used to help evaluate the proposed alternatives. Furthermore, the decision criteria identified in the previous planning step (i.e., development of planning criteria) are used to evaluate the positive and negative consequences or impacts of each alternative. In this instance, the planning criteria can also be considered “key indicators” to assess the degree of change from one alternative to other alternatives, in particular, to compare the no action (existing condition) alternative to the other alternatives.
- Each alternative will have different strengths and weaknesses, and it is likely that one or two of the alternatives among the range provided will be preferred. It is beneficial to examine the preferred alternatives more closely in order to mitigate their most significant negative consequences or impacts and to integrate the strengths from other alternatives. This facet of evaluating the alternatives has been called mitigation assessment and enhancement analysis.

## Implementing and Monitoring

- This step involves the implementation of the selected or preferred alternative, which includes implementing the WROS strategy proposed in the alternative. Inconsistency mitigation and the matrix in figure 17

**Figure 21. An Example Evaluation Matrix for Comparing Management Alternatives Using WROS**

Evaluation Criteria	Alternative #1						Alternative #2					
	U	S	RD	RN	SP	P	U	S	RD	RN	SP	P
1. Recreation management prescription for each WROS class (e.g., objectives and quality standards)												
2. Number and percent of water and land acres by WROS class: a. Spring b. Summer c. Fall d. Winter												
3. Percent of water surface acres by WROS class for other water bodies in the region												
4. Major management actions and programs												
5. Boat capacity for selected locations												
6. Estimated budget and personnel needs												
7. Economic benefits: a. Projected visitor expenditures b. Public valuation												

**Figure 22. A Bar Graph Comparison of Four Alternatives Based on the Percent of Water Surface Acres for each WROS Class**

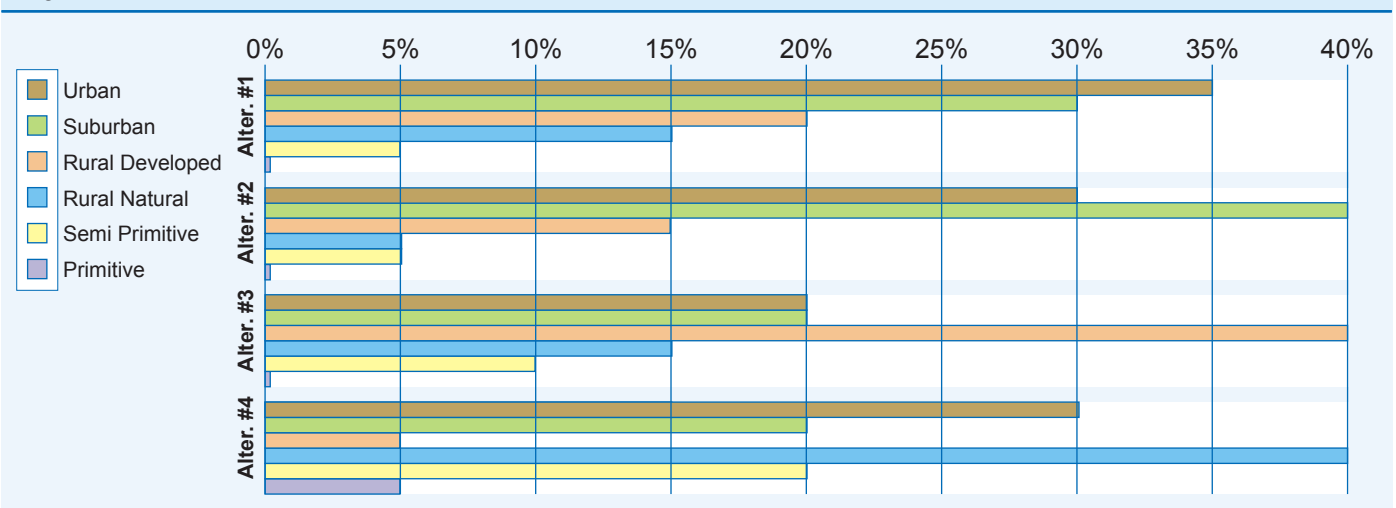
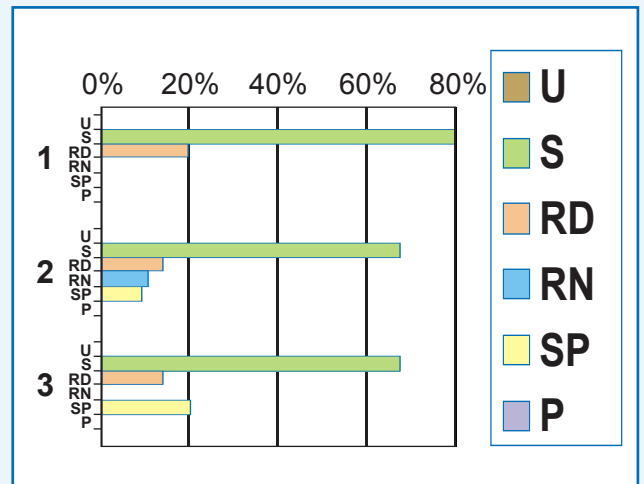
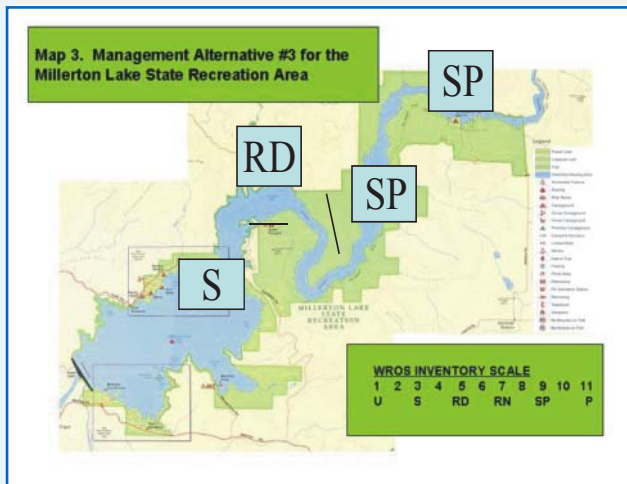
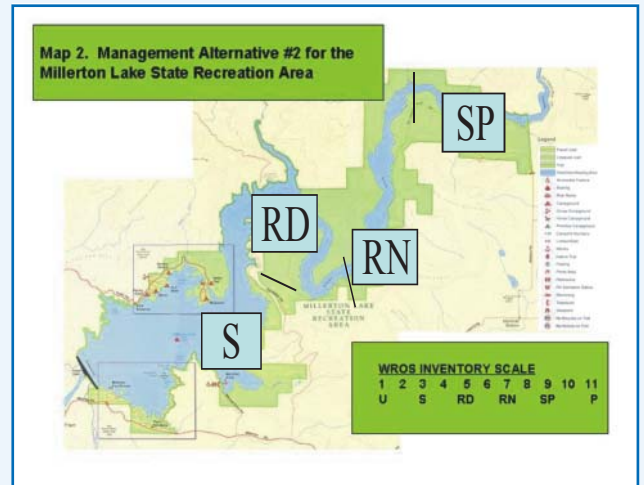
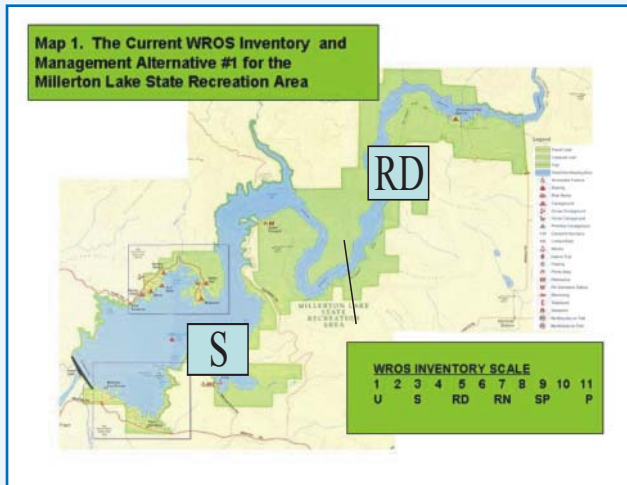


Figure 23. An Example of Using WROS to Compare Alternatives



in chapter 2 are useful in prioritizing and scheduling the implementation of activities and programs over time and across the study area.

- Monitoring is a vital tool to help managers learn from their efforts, to be responsive, and to make good changes during implementation (i.e., adaptive management). It is important to integrate monitoring activities into the responsibilities of all personnel and to view monitoring as an on-going and routine management responsibility. The monitoring program need not be complex but does need to cover important components: (1) monitor selected standards at sample sites (see the guidelines in *Chapter 4: WROS Management*) and assess the current situation versus the desired or intended guidelines, (2) monitor the actual versus desired or intended water recreation opportunity for an area (e.g., type, amount, location, duration, and quality of recreation opportunity), and (3) monitor the actual versus planned annual budgets, personnel assignments, activities, actions, and programs.
- Preferably on an annual basis, a staff meeting should be held to review the monitoring data, identify potential reasons for achieving or not achieving planned targets and standards, propose strategies to mitigate negative consequences or new circumstances, and discuss priority actions and locations. Adaptive management is an expectation in the WROS system. Change should be expected as a result of knowledge gained from monitoring as well as from new science, information, or circumstances. Yet, adaptation and change should be deliberate and based on the same standards for decision making as prescribed in chapter 1.

## Evaluating and Adapting

- This is an on-going step of assessing the information gathered by monitoring and taking steps to alter the management to achieve the desired goals and objectives.

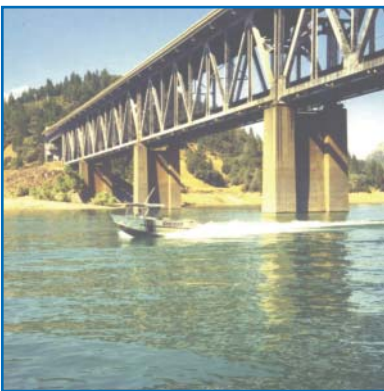
This concludes *Chapter 3: WROS Planning*. A preferred alternative has been chosen. The manager is now responsible for maintaining the integrity of the resource and the water recreation opportunities as set forth in the plan. *Chapter 4: WROS Management* provides guidelines to help ensure this integrity.



# Chapter 4: WROS Management



# WROS Management



Above, trails are important to access water.

Center, monitoring recreation use is critical.

Bottom, this patrol boat and the law enforcement it provides is a very important management tool.

Recall from *Chapter 1: Introduction*, that recreation managers provide *recreation opportunities*. Managers provide opportunities for visitors to participate in a type of recreation activity in a specific setting defined by its important physical, social, and management attributes to realize a particular type of experience and subsequent benefits. (See figure 1 in chapter 1.) This section contains recommended management guidelines for many setting attributes that, when considered together, compose and define the WROS class and its recreation opportunity. For example, if a manager is managing a section of a lake or river for rural developed recreation, the guidelines in the rural developed column should be duly considered.

Management guidelines are intended to provide guidance, yet be flexible and adaptable to special local situations. They serve as triggers or trip-wires to signal that further assessment or action may be necessary (e.g., more monitoring, patrols, or discussion). The fact that a guideline or standard is not being met does not, in and of itself, obligate or direct management action, but does signal that the appropriate level of due deliberation and diligence be taken. Guidelines also are critical for a quality monitoring program because they provide a reference point, baseline, or anchor by which managers can compare current actual conditions to the desired conditions reflected by the guidelines.

Deviation from the recommended guidelines will occur occasionally, yet a decision to deviate should be made only after careful and due deliberation of the facts and circumstances. It is important to thoughtfully address the basic questions: What is the justification for any deviation and will the deviation violate the integrity of the WROS system? Sound professional judgment and the rule of reasonableness (see chapter 1) should be the standards for decision making. It is also important to include a written detailed explanation in the administrative record for future administrative or judicial inquiries.

## Management Guidelines

This section provides guidelines for the physical, social, and management attributes across each WROS class. This section will continue to evolve and improve over time with management experience and greater input from professionals.

For each specific attribute in this section, a qualitative or quantitative descriptor conveys the appropriateness or recommended degree or extent that

each attribute may be present for each WROS class. Figure 10 is repeated below for clarification of the descriptors used in following guidelines.

**Figure 10. (Repeated from Chapter 1) The Scale of Degree used in WROS**

Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
80-100%	50-80%	20-50%	10-20%	3-10%	0-3%
Dominant	Very prevalent	Prevalent	Occasional	Minor	Very minor
Extensive	Widespread	Common	Infrequent	Little	Very little
A great deal	Very obvious	Apparent	Periodic	Seldom	Rare
Extremely	Very	Moderately	Somewhat	Slightly	Not at all

**Physical Setting Guidelines**

Physical Attributes	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
<b>Degree of Development</b> Degree that dams, major bridges, marinas, parks, resorts, highways, or other municipal, industrial, or commercial structures are present	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare
<b>Sense of Closeness to a Community</b> Degree that visitors sense that they are close to the sights, sounds, and smells typical of a community	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare

Physical Setting Guidelines - Continued						
Physical Attributes	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
<b>Degree of Natural Resource Modification</b> Degree that the visitors are aware that the natural resources have been altered by human activity, technology, or development	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare
<b>Distance from Development on or Adjacent to the Water Resource</b> Mileage from dams, major bridges, marinas, resorts, or other municipal, industrial, commercial, or residential areas	Less than 0.5 mile	0.5-2 miles	2-5 miles	5-8 miles	8-10 miles	More than 10 miles
<b>Degree that Natural Ambiance Dominates the Area.</b> Degree that there is a sense of tranquility and opportunity to see, hear, and smell nature	Very minor, very little, or rare	Minor, little, or seldom	Occasional, infrequent, or periodic	Prevalent, common, or apparent	Very prevalent or widespread	Extensive, dominant, or a great deal
Water quality standards	Meet or exceed State standards	Meet or exceed State standards	Meet or exceed State standards	Meet or exceed State standards	Exceed State standards	Exceed State standards
Air quality standards	Meet or exceed State standards	Meet or exceed State standards	Meet or exceed State standards	Meet or exceed State standards	Exceed State standards	Exceed State standards
Visual quality objective	Maximum modification	Maximum modification	Modification	Partial retention	Retention	Preservation
Communication towers	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA

Physical Setting Guidelines - Continued						
Physical Attributes	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
Silos and stacks	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Break wall, riprap, channelization	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Human-built structures and activities	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Commercial air traffic (e.g., noise, contrails, number)	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA

Social Setting Guidelines						
Social Attributes	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
<b>Degree of Visitor Presence</b> Degree that the sights, sounds, and smells of other visitors, their equipment, or their impacts or litter are present	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare
<b>Degree of Visitor Concentration</b> Degree that visitors congregate on the shore or water in the area (e.g., coves, launches, swim areas, good fishing spots, camp areas)	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare

Social Setting Guidelines - Continued						
Social Attributes	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
<b>Degree of Solitude and Remoteness</b> Degree that visitors view themselves as being alone and far away from civilization in a wild and remote place	Very little	Little	Occasional	Prevalent	Very prevalent	Dominate or extensive
<b>Degree of Non-Recreational Use, if Any</b> Degree that the sights, sounds, and smells of non-recreational use and users are present (i.e., activities associated with commerce, work places, industry, roads, airplanes, agriculture, and communications)	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare
Reasonable standard for the percent of “extremely” or “very” satisfied visitors (see scale in Figure 10)	80 %	80 %	80 %	80 %	80 %	80 %
Reasonable standard for the percent of “extremely” dissatisfied visitors (see scale in Figure 10)	10 %	10 %	10 %	10 %	10 %	10 %
Reasonable standard for the percent of visitors who would like to visit the area again	70 %	70 %	70 %	70 %	70 %	70 %

<b>Social Setting Guidelines - Continued</b>						
<b>Social Attributes</b>	<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
Reasonable standard for the percent of visitors who would tell others that this site is a good place to visit	80 %	80 %	80 %	80 %	80 %	80 %
Reasonable number of audio boat encounters per day	NA	NA	NA	NA	Less than 10 boats per day	Less than 3 boats per day
Reasonable number of visual boat encounters per day	NA	NA	NA	NA	Less than 10 boats per day	Less than 3 boats per day
Reasonable standard for percent of boating accidents per number of boat launches	.01%	.01%	.01%	.005%	.005%	.001%
Reasonable standard for the percent of emergency medical responses per number of recreation groups	.01%	.01%	.01%	.005%	.005%	.001%
Reasonable standard for the percent of verbal or physical conflicts per number of boat launches	.01%	.01%	.01%	.005%	.005%	.001%
Reasonable standard for the percent of noise disturbances per number of recreation groups	10%	10%	10%	5%	1%	1%

Social Setting Guidelines - Continued						
Social Attributes	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
Reasonable standard for percent of visitors perceiving “extreme” or “very” high crowding (see scale in Figure 10)	25%	20%	20%	10%	5%	5%
Reasonable standard for the percent of repeat visitors indicating the resource is “extremely” or “very” adversely effected (see scale in Figure 10)	20%	20%	20%	20%	10%	10%
Reasonable standard for the percent of repeat visitors indicating the experience has been “extremely” or “very” adversely effected since a previous visit (see scale in Figure 10)	20%	20%	20%	20%	20%	20%
Reasonable standard for the percent of visitors complaining about the same specific issue	10%	10%	10%	5%	5%	5%



Managerial Setting Guidelines						
Managerial Attributes	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
<b>Degree of Management Presence</b> Degree that management personnel, boat patrols, signage, equipment, beacons, water markers, buoys, entry stations, wakeless zones, closures, speed zones, regulations, security lighting, administrative offices and compounds, or interpretative programs are present.	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare
<b>Degree of Public Access Facilities</b> Degree that developed access facilities are present such as boat ramps, paved roads and trails, or swim beaches	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare
<b>Degree of Developed Recreation Facilities and Sites</b> Degree that developed campgrounds, pump stations, paved parking, utilities, amphitheaters, picnic sites, play areas, nature trails, flush toilets, showers, docks, piers, visitor centers, or concessions such as marinas or resorts are present.	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare

Managerial Setting Guidelines - Continued						
Managerial Attributes	Urban	Suburban	Rural Developed	Rural Natural	Semi Primitive	Primitive
<b>Degree of Visitor Services and Conveniences</b> Degree that restaurants, fuel, boat rentals, guide services, food stores, medical services, utilities, lighting, or telephones and faxes are within a few miles.	Extensive or dominant	Very prevalent or widespread	Prevalent, common, or apparent	Occasional, infrequent, or periodic	Minor, little, or seldom	Very minor, very little, or rare
Reasonable maximum decibel levels	65-75 decibels	65-75 decibels	55-65 decibels	55-65 decibels	45-55 decibels	35-45 decibels
Reasonable maximum boat speed	35-45 mph	35-45 mph	35-45 mph	15-30 mph	5-15 mph (slow wake)	5 mph (no wake)
Reasonable launch time	Less than 30 minutes	Less than 30 minutes	Less than 30 minutes	Less than 15 minutes	No wait	No wait
Reasonable retrieval time	Less than 30 minutes	Less than 30 minutes	Less than 30 minutes	Less than 15 minutes	No wait	No wait
Quiet times	10 pm to 6 am	10 pm to 6 am	10 pm to 6 am	10 pm to 6 am	24/7	24/7
Reasonable minimum number of flat water acres per boat	1 to 10 acres	10 to 20 acres	20 to 50 acres	50 to 110 acres (1/4 sq. mi.)	110 to 480 acres (3/4 sq. mi.)	480 to 3200 acres (5 sq. mi.)
Reasonable separation between river boating groups	1/8 mile (220 yds)	1/4 mile (440 yds)	1/4 mile (440 yds)	1/2 mile or a 20 minute separation	2 miles or a 1 hour separation	4 miles or a 2 hour separation
Vehicle parking at beach and picnic sites	25+ per acre	20 to 25 per acre	15 to 20 per acre	10 to 15 per acre	NA	NA
Houseboat size maximum width	16 feet wide	16 feet wide	16 feet wide	16 feet wide	16 feet wide	NA
Space between houseboats on mooring balls*	1.25 times the length of the boat	1.25 times the length of the boat	1.25 times the length of the boat	1.25 times the length of the boat	NA	NA

\*Preferable houseboats would be in dock slips

<b>Managerial Setting Guidelines - Continued</b>						
<b>Managerial Attributes</b>	<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
Minimum number of acres per group campsite in developed campground	5	5	5	10	NA	NA
Campsites per acre in developed campground	5 to 10 per acre	5 to 10 per acre	3 to 5 per acre	3 per acre	NA	NA
Minimum distance between dispersed shoreline campsites outside of developed campgrounds	NA	NA	1/8 mile (220 yds)	¼ mile (440 yds)	½ mile or out of sight and sound of other parties	1 mile or out of sight and sound of other parties
Minimum distance between floating campsites outside developed campgrounds	NA	NA	1/8 mile (220 yds)	¼ mile (440 yds) and out of sight of other campsites	½ mile and out of sight and sound of other campsites	1 mile and out of sight and sound of other campsites
Picnic and day-use areas	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Designated beach areas	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Paved boat ramps	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Unpaved boat ramps	NA	NA	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA

<b>Managerial Setting Guidelines - Continued</b>						
<b>Managerial Attributes</b>	<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
Overnight security lights	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Marine sanitation devices on boats	Appropriate and may be required	Appropriate and may be required	Appropriate and may be required	Appropriate and may be required	Appropriate and may be required	Appropriate and may be required
Modern restrooms (e.g., flush toilets, electricity)	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Rustic septic or vault toilets	NA	NA	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Floating camping platforms	NA	NA	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Designated campsites	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	Appropriate and may be very little
Interpretive signs	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Directional signs	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Regulatory signs	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Visitor centers	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Paved trails	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Unpaved trails	NA	NA	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	Appropriate and may be very few

<b>Managerial Setting Guidelines - Continued</b>						
<b>Managerial Attributes</b>	<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
Water-based trails (e.g., boat, raft, scuba)	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Paved parking	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	NA	NA	NA
Unpaved parking	NA	NA	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Modern, full service RV and tent campgrounds	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Rustic or primitive campgrounds (e.g., no utilities)	NA	NA	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Large-group picnic and camping facilities	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Full service resorts	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	NA	NA	NA
Full service marinas	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	NA	NA	NA
Fuel services and storage	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Golf courses	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	NA	NA	NA
Sports fields	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	NA	NA	NA

<b>Managerial Setting Guidelines - Continued</b>						
<b>Managerial Attributes</b>	<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
Community boat docks	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Youth camps and dude ranches	NA	NA	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Interpretive programs (e.g., trail or boat tours)	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Fishing tournaments	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	NA
Boat racing events	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	NA	NA	NA
Life guards	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Reservation systems (e.g., launch times, picnic, campsites, tours)	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
User fee systems (e.g., camping, tours, entrance, launches, services)	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
Administrative buildings (e.g., entrance stations, employee housing, equipment storage)	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Land-based food service concessions	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA

<b>Managerial Setting Guidelines - Continued</b>						
<b>Managerial Attributes</b>	<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
Long-term use permitted	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Outdoor shooting or archery ranges	NA	NA	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Amphitheaters	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Wildlife viewing stations	Appropriate	Appropriate	Appropriate and may be common	Appropriate and may be occasional	NA	NA
General utilities (electricity, sewer, water)	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Access for persons with disability	Appropriate where reasonable	Appropriate where reasonable	Appropriate where reasonable	Appropriate where reasonable	Appropriate where reasonable	Appropriate where reasonable
Fireplaces/grills	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Fish cleaning stations	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	NA	NA
Fishery habitat improvements	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate but not intrusive	Appropriate but not intrusive
Vegetative management	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate but not intrusive	Appropriate but not intrusive
Wildfire management	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate but not intrusive	Appropriate but not intrusive
Resource monitoring	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate but not intrusive	Appropriate but not intrusive
Visitor monitoring	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate but not intrusive	Appropriate but not intrusive

<b>Managerial Setting Guidelines - Continued</b>						
<b>Managerial Attributes</b>	<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
Minimum standard for monitoring visitor use (type, amount, location, duration)	Daily in primary season, weekly in secondary	Daily in primary season, weekly in secondary	Daily in primary season, weekly in secondary	Weekly in primary season, monthly in secondary	Weekly in primary season, monthly in secondary	Monthly in primary season, monthly in secondary
Minimum standard for monitoring visitor satisfaction/perceptions/preferences	Every 3 years	Every 3 years	Every 3 years	Every 3 years	Every 3 years	Every 3 years
Minimum standard for monitoring regional recreation demand and supply trends	Every 3 years	Every 3 years	Every 6 years	Every 6 years	Every 6 years	Every 6 years
Limit on the number of visitors to protect the resources	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
Limit on the number of visitors to protect quality of experience	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
Limit on the number of visitors to protect special or important values	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate



<b>Managerial Setting Guidelines - Continued</b>						
<b>Managerial Attributes</b>	<b>Urban</b>	<b>Suburban</b>	<b>Rural Developed</b>	<b>Rural Natural</b>	<b>Semi Primitive</b>	<b>Primitive</b>
Limit on the number of visitors to protect health and human safety	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
Management zoning (e.g., wakeless areas, no camping, security areas)	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	Appropriate and may be very little
Speed limits on boats	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
Law enforcement presence	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	Appropriate and may be very little
Volunteers	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
Cooperating associations	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
Reservoir drawdown	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	Appropriate and may be very little
In-stream flow or reservoir elevation modification	Appropriate and may be extensive	Appropriate and may be very prevalent	Appropriate and may be common	Appropriate and may be occasional	Appropriate and may be seldom	Appropriate and may be very little

## Boating Capacity

In 2002, the Federal Interagency Task Force on Visitor Capacity on Public Lands and Waters delivered its final report to the Assistant Secretary for Fish and Wildlife and Parks, U.S. Department of the Interior. The Task Force was a 2-year effort to improve visitor capacity decision making affecting the lands and waters managed by the Bureau of Land Management, Bureau of Reclamation, Fish and Wildlife Service, Forest Service, and National Park Service. The report contains important background information on the concept of visitor capacity, a set of principles and decision criteria for decision making, seven tools to help make better and more defensible capacity decisions, and a directory of 100 locations in the United States that have numerical visitor capacities. Pages 10-22 of the report are particularly relevant to WROS and to this guidebook and are excerpted below. The full report can be obtained by contacting the National Recreation and Park Association in Ashburn, Virginia, or at [www.nrpa.org](http://www.nrpa.org). The citation for the final report is:

Haas, G. E. 2002. *Visitor Capacity on Public Lands and Waters: Making Better Decisions*. A Report of the Federal Interagency Task Force on Public Lands. Submitted to the Assistant Secretary for Fish and Wildlife and Parks, U.S. Department of the Interior, Washington, D.C. May 1, 2002. Published by the National Recreation and Park Association, Ashburn, Virginia. (ISBN 0-929581-66-0)

The excerpted pages are followed by a set of recommended boating capacity coefficients for each WROS class and a decision tool to help ensure that important factors are duly considered.

# 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).

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.

#### Excerpt Figure 1. Definition of a Visitor Capacity

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

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*
- ◆ *15-18 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*
- ◆ *80-100 raft launches per weekday; 150-170 per weekend*
- ◆ *550 boat slips*
- ◆ *50 shoreline campsites when water level is below 2,550 elevation*
- ◆ *25 ice fishing groups at one time, 4 holes per party*
- ◆ *30-40 vehicles at one time at the trailhead*
- ◆ *200-250 persons at one time on the summit*

In any case, the numeric capacity represents 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.

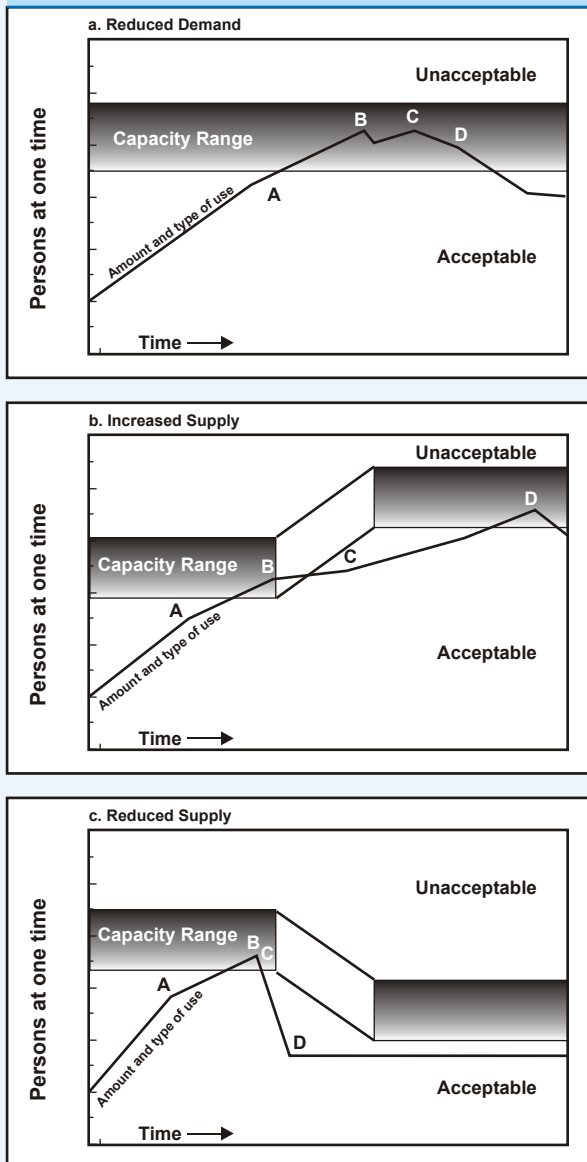
**Regional recreation planning:** numeric capacities are fundamental for regional recreation planning, recreation demand and supply analysis, multi-jurisdictional allocation decisions, coordinated visitor trip planning information systems, identification of recreation facility needs and investment opportunities, 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.

## Triggering a Change in Supply or Demand.

Excerpt Figure 3. Capacity Can Trigger



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.

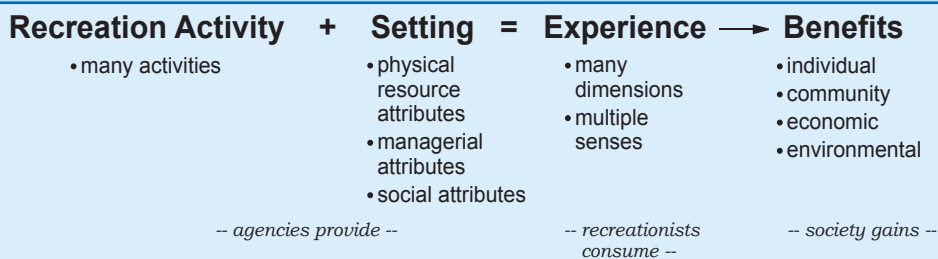
The Task Force wishes to highlight two important cautions. First, public land managers manage an area to provide a particular type of opportunity to the public. Each recreation opportunity is an integrated package of activities, settings, experiences, and benefits (see Figure 4). Thus, to change the 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 adaptation. 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.

**Conserving Resources and Recreation Opportunities.** The overarching function of a visitor capacity is to help conserve resources, as well as the opportunities and values they afford. For some, the goal of sustaining recreation opportunities is not viewed as being compatible with the goal of sustaining resources. However, the Task Force sees the relationship as synergistic.

Public land managers provide recreation opportunities to the public. A recreation opportunity can be defined as the opportunity for a person to participate in a particular activity in a specific setting, in order to realize a preferred type of experience and subsequent benefits. Figure 4 depicts that a recreation opportunity is an integrated package of activities, settings, experiences, and benefits.

**Excerpt Figure 4. A Recreation Opportunity**



The setting is further composed of three components: physical resource attributes, social attributes, and management attributes. Managerial attributes affecting an experience might include recreation facilities, roads, power lines, interpretive programs, signage, fees, rules, regulations, patrol, cleanliness, closures, reservation systems, concessions, and O&M activities. Social attributes affecting an experience might include other visitors (recreation and non-recreation) to an area, their behaviors, equipment, group size, sounds, and artifacts of previous visitors. Natural resource attributes affecting an experience might include the type and variety of wildlife, fish, topography, vegetation, water, air, sounds, soils, canyons, coral, cave formations, and colors.

The intersection of natural resources with a recreation opportunity is conveyed in the physical resource attributes. That is, a particular recreation opportunity is dependent upon a variety of physical resource attributes important to that experience. Impairment of important resources (natural or cultural) is also impairment of recreation opportunities.

Conversely, the provision of recreation opportunities contributes to a citizenry that is more knowledgeable, caring, and supportive of resource management and protection. In a society where the public is sovereign, impairment of public support is a tantamount to impairment of natural and cultural resources. Stated otherwise, conserving resources depends upon conserving appropriate recreation opportunities.

There are three important considerations in a successful synergistic relationship.

**Appropriate Use.** Public land managers should favor those recreation opportunities that are dependent upon the important natural or cultural resource attributes for which the area has been designated or is being managed to protect. Other recreation opportunities may not be appropriate and should be given less priority, if provided for at all. For example, the Fish and Wildlife Service has a mandate to focus on six “wildlife-dependent” recreation opportunities for its refuges, beyond which other opportunities are reviewed for appropriateness and compatibility. The Task Force provides an “appropriate use” decision-making protocol later in this report.

**Clarity.** Public land managers need to develop management objectives, desired future conditions, and standards that are unambiguous and measurable. Qualitative expressions are necessary and helpful to provide contextual understanding, but the precision and clarity offered by quantitative or numeric expressions are also needed. A successful



relationship between resources and recreation requires clear operational definitions of such terms as sustainable, impairment, adverse, significant, substantially unnoticeable, unacceptable change, appropriate use, recreation experience, and visitor satisfaction.

**Learning and Adaptation.** The scientific relationship between resources and recreation is not well understood. In fact, the multiplicity of factors and interactions may be beyond scientific determination and even human comprehension. This possibility adds importance to the process of monitoring, learning, and adapting. Public land managers must prepare to learn and adapt to new knowledge, information, and circumstances. Learning over time requires the ability to look backwards and to understand the details of yesterday in comparison to today. Thus, it is important to maintain an administrative and historic record of unambiguous and measurable management objectives, desired future conditions, standards, and capacity.

### **The Substantive Standard for Visitor Capacity Decision Making**

Sound professional judgment is the substantive standard for decision making by responsible public officials.

Inputs to a Capacity Decision. Sound professional judgment relies on many informational inputs. Those particularly relevant to a visitor capacity decision might include:

- ◆ management objectives (including all legislative and policy guidance);
- ◆ desired future conditions and quality standards (resource, social, management);
- ◆ current and future recreation demand (who, where, what, when, how, why);
- ◆ current resources, conditions, uniqueness, capability, and trends;
- ◆ current management capability and suitability;
- ◆ current type, amount, and design of facilities and infrastructure;
- ◆ appropriateness (compatibility) of current or proposed recreation opportunities;
- ◆ regional supply of the same and similar recreational opportunities;

#### **Excerpt Figure 5. Sound Personal Judgement**

*A reasonable decision that has given full and fair consideration to all the appropriate information, that is based upon principled and reasoned analysis and the best available science and expertise, and that complies with applicable laws.*

- ◆ foreseeable changes in recreation and nonrecreational uses;
- ◆ existing allocations to permittees and other land uses/users;
- ◆ significance of the visitation issues and concerns;
- ◆ potential for natural or cultural resource impairment;
- ◆ type and amount of best available science and information;
- ◆ level of uncertainty and risk surrounding consequences of decision; and the
- ◆ expected quality of the monitoring program.

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Notes of Clarification: The literature contains reference to many “carrying capacities” such as biological, physical, design, social, recreational, facility, transportation, infrastructure, program, and public safety. The Task Force views visitor capacity as an omnibus metric that gives due consideration to all these factors and others in the decision process listed above. The degree of influence of each factor will vary across situations. For example, in one situation the biological considerations might weigh heavily, while in another they might not be relevant. In another situation, it might be the accumulative effects of the social, transportation, and biological considerations that significantly influences the visitor capacity decision.

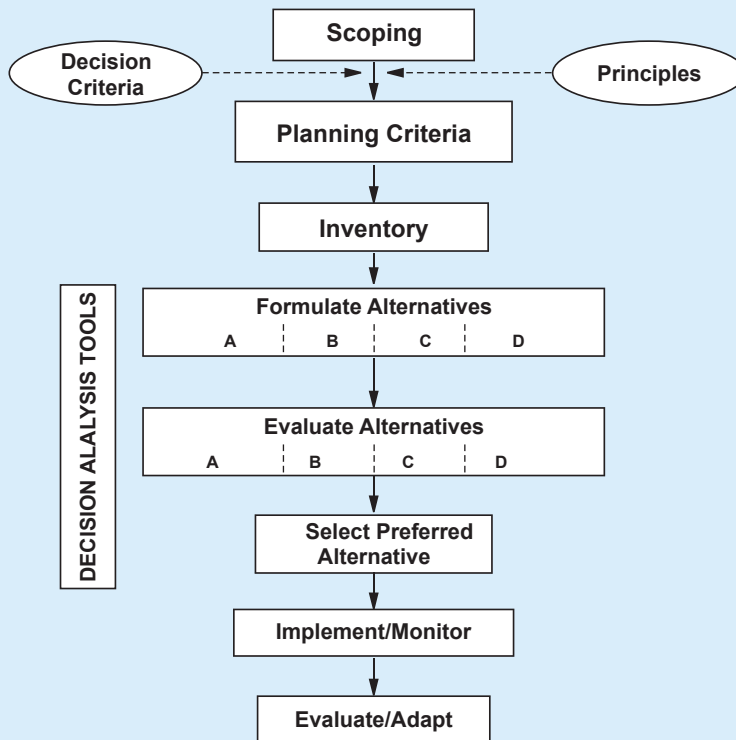
### **The Procedural Standard for Visitor Capacity Decision Making**

While sound professional judgment is the substantive standard for capacity decision making, a rational public planning process is the procedural standard for capacity decision making. In addition to the procedural planning guidance provided by the National Environmental Policy Act (NEPA), each agency has tailored the NEPA guidance to their own agency's needs and perspectives to create similar but unique planning processes, terminology, sequencing, and other varying features.

The Task Force does not propose a new planning process, but rather views a capacity decision as simply one decision among many that is made as part of an existing agency's planning process. Thus, rather than including the planning model for each federal agency, a generic planning model (Figure 6) is presented to illustrate the link between the Task Force outputs shaded in white and a public planning process. A narrative description on the following page further clarifies this link.

Generic Public Land Agency Planning Process. The purpose of this generic planning process is to generally show where the products (bolded) of this Task Force fit within a public planning process, and to illustrate where numeric capacities are part of each alternative for due consideration in assessing consequences and selecting a preferred alternative.

Excerpt Figure 6. Planning Process



### Scoping

- ◆ identify significant public issues, management concerns, problems, and opportunities
- ◆ identify stakeholders and a plan of collaboration
- ◆ assess the quality and quantity of scientific data and monitoring information

### Planning criteria

- ◆ laws, regulations, agency mission, and policies
- ◆ principles (e.g., biodiversity, ecosystem management, visitor capacity, social justice)
- ◆ planning horizon, resources, process, and scale
- ◆ decision criteria to assess consequences of alternatives
- ◆ identification of units that have had similar experiences for consultation (comparables or analogs)

- ◆ Inventory of the affected planning area
- ◆ resources, types, locations, conditions, uniqueness, and ecosystem function
- ◆ social use and users, locations, type and quality of experience, regional demand/supply, and trends
- ◆ management infrastructure, services, programs, personnel, budget, partners, and expected changes
- ◆ recreation opportunities provided by other agencies/private sector within the “visitation” region

**Formulate a reasonable range of alternatives, with each containing**

- ◆ management prescriptions with narrative description and objectives
- ◆ desired future conditions and standards for important resource, social, and managerial attributes
- ◆ application of prescription(s) to all or part of planning area (zoning)
- ◆ selected management tools and actions, budget requirements, and expected level of monitoring
- ◆ numeric capacity range(s) and allocations (if and where appropriate)
- ◆ decision analysis tools that can help create a reasonable range of alternatives

**Evaluate alternatives (see figure 7)**

- ◆ application of decision criteria to assess consequences
- ◆ application of decision analysis tools

Excerpt Figure 7. Evaluate Alternatives				
	A	B	C	D
• Management Objectives				
• Desired Conditions				
• Indicators and Standards				
• Management Actions				
• Zones				
• Capacities				
• Allocations				
• Budget Requirement				
• Other Descriptors				

- ◆ best available science and sliding scale of analysis
- ◆ consideration of trade-offs and mitigation actions

#### **Select preferred alternative**

- ◆ principles and decision criteria
- ◆ sound professional judgment

#### **Implement and monitor**

- ◆ implement planned management activities/programs
- ◆ monitor actual visitation (number and type)
- ◆ monitor natural and human-induced change to the natural and cultural resources
- ◆ monitor resource, social, and managerial indicators

#### **Evaluate and adapt**

- ◆ systematically evaluate monitoring data and new information, science, and circumstances
- ◆ application of appropriate decision criteria and decision tools to proposed changes
- ◆ sound professional judgment

### **3. Principles and Decision Criteria**

This section addresses the first output of the Task Force: principles and decision criteria for visitor capacity decision making.

#### **Principles for Visitor Capacity Decision Making**

The Administrative Procedure Act (1946: 60 Stat. 237, 5 U.S.C.A.) set forth the legal standard that decisions must be principled and reasoned; that is, arbitrary decisions are in violation of federal law. Professional principles help meet this responsibility by clarifying institutional values, philosophy, and perspectives. They serve as a guide and rule of thumb for making decisions and taking action, and, very importantly, they help stakeholders understand and meaningfully participate in a planning process.

Below are principles that reflect important and central values for visitor capacity decision making. Full and deliberate consideration of these

principles will contribute to a logical, reasoned, transparent, and defensible decision.

- ◆ Management direction principally defines the visitor capacity, regardless of whether the management direction or visitor capacity is explicitly stated or not stated at all.
- ◆ A visitor capacity helps to sustain the integrity of natural and cultural resources, as well as the important recreational and nonrecreational benefits they afford to local, regional, and national publics.
- ◆ A visitor capacity is a complex decision that is based upon sound professional judgment; i.e., defined as a decision that has given full and fair consideration to all appropriate information, that is based upon principled and reasoned analysis and the best available science and expertise, and that complies with applicable laws.
- ◆ A visitor capacity decision is made by a responsible official as part of a public planning process; and in some instances, may benefit from the thoroughness and legal sufficiency afforded by a NEPA-compliant planning process.
- ◆ A visitor capacity quantifies the supply of available visitor opportunities that an area can accommodate, and may also address the allocation of opportunities across the variety of affected visitors types of recreationists, commercial operators, educational programs, scientists, and others.
- ◆ A visitor capacity decision considers the larger regional landscape and system of opportunities affecting the particular area of recreation concern.
- ◆ A visitor capacity provides clarity for focused dialogue and an analysis of consequences across the proposed management alternatives under consideration in a planning process.
- ◆ A visitor capacity decision uses a sliding-scale rule, in which the level of analysis is commensurate with the potential consequence of the decision.
- ◆ A visitor capacity serves as a trigger or signal for managers, permittees, the general public, and all stakeholders.

- ◆ Visitor use approaching a capacity triggers consideration of a full range of reasonable management responses.
- ◆ A visitor capacity decision needs to be adaptive to new science, information, uses, technology, trends, conditions, and other circumstances of importance.
- ◆ The effectiveness of a visitor capacity depends on an adequate program of monitoring that is commensurate with the level of potential consequences, risk, and uncertainty.

### **Decision Criteria for Visitor Capacity Decision Making**

Arbitrary decisions are those made without principle and reason. In natural resource planning nomenclature and in this report, reasons for decisions are referred to as decision criteria.

**Making Complex Decisions Less Complex.** A capacity decision is a complex decision. The field of decision science provides many insights into making decisions. For example, one reason why decisions are complex is because while one person approaches a situation from one perspective and set of concerns, another person approaches the same situation from another perspective and set of concerns. Individuals will also view a situation differently because each carries their own “suitcase” of biases, prejudices, perceptions, stereotypes, backgrounds, knowledge, past experiences, and other mental artifacts.

Another reason why decisions are complex is because humans have a limited mental capacity and memory to consider the multiple factors that are important. This limitation works against a full and comprehensive analysis.

Thus, an explicit list of decision criteria can serve several important functions in rational public planning. First, an explicit list of decision criteria, developed early in the planning process with public input, helps to make a decision process transparent and trackable to stakeholders. These criteria help to establish the *ground rules*, the *rationale* in a rational process, and *the pieces of the puzzle* to be considered in the decision. Second, decision criteria can help in creatively developing a full set of reasonable alternatives. In the formulation of the alternatives, the decision criteria will identify

important content areas to be included in the description of the alternatives. Third, an explicit list of decision criteria helps assure a full, fair, adequate, and deliberate evaluation and assessment of the consequences of each alternative. Fourth, decision criteria can improve communications and increase meaningful public participation, understanding, and support. Fifth, an explicit list of criteria is important when more advanced decision analysis is desired such as weighting, ranking, or mathematical computations. Sixth, an explicit list is demonstrable evidence for the administrative record. And finally, criteria are important for adaptive management because they help us understand and learn from past decisions and experiences.

**Choosing Decision Criteria.** A decision maker has a responsibility to use sound judgment, which is defined as “full and fair consideration” of the important issues and concerns expressed by managers and stakeholders. The number and selection of criteria used to evaluate and assess the consequences of each alternative need to fully reflect and duly consider the circumstances at hand, as well as being commensurate with the potential consequences of the decision to be made. A reasonable rule of thumb is that as the magnitude of the potential consequences of the decision increase, the number of criteria needed to adequately assess the situation also increases.

**Sample Decision Criteria.** As previously discussed in the planning section, a visitor capacity is one feature among many that can define and discriminate proposed alternatives. The following list illustrates a wide variety of decision criteria that can be used to evaluate alternatives. It is not intended to suggest that every criteria be used for each planning effort, nor is it intended to suggest that a special set of criteria is needed for a capacity decision.

#### Excerpt Figure 8. Sample Decision Criteria

**Effects Ecological Integrity.** The degree to which each alternative:

- affects unique or sensitive resources locally, regionally, or nationally
- affects the ecological integrity of site, local vicinity, or bio-region
- impacts the desired future conditions or quality standards (i.e., extent of physical/audio footprint, duration, timing, reversibility, cumulative effects)
- affects the important or priority resources or values the area is being managed to protect
- helps build or connect a larger regional system of resources
- has irreversible effects on resources, or effects that cannot be restored or recovered

*continued*



### Excerpt Figure 8. Sample Decision Criteria - Continued

**Supported by Science.** The degree to which each alternative:

- is supported by scientific study and expert consensus
- is supported by agency professionals, advisors, and consultants
- has a level of analysis that is commensurate with potential consequences
- is based upon reasonable assumptions and trends
- may involve highly uncertain risks or consequences
- is based on unavailable or incomplete scientific information
- will secure needed scientific information in the future
- has an adequate monitoring program involving resource, social, and managerial attributes

**Level of Public Support.** The degree to which each alternative:

- is controversial among visitors, locals, regional and national publics
- is supported by visitors, locales, regional and national publics
- contributes to the desired welfare of stakeholders (e.g., local communities, the tourism industry, adjacent landowners, educational/research institutions, private operators, concessionaires, and special interest groups)
- builds meaningful and appropriate partnerships with collaborators
- causes harm or a unfair negative consequences to less advantaged people
- allows for options and opportunities for future generations

**Effects Integrity of Recreation Experience.** The degree to which each alternative:

- affects the integrity of the recreation experience that the area is being managed for
- is appropriate and consistent with the management objectives for the area
- may compromise desired future conditions or quality standards (i.e., extent of physical/audio footprint, duration, timing, reversibility, cumulative effects)
- affects unique or rare recreation opportunities locally, regionally, or nationally
- provides for unique or rare recreation opportunities locally, regionally or nationally
- contributes to a large regional system of recreation opportunities
- is based upon reasonable future social trends and assumptions
- makes recreation opportunities more available to less advantaged publics
- attracts visitors who otherwise would not visit
- considers the latent or unmet demand of those publics not visiting
- provides an appropriate recreation experience by the least intrusive means
- allows for personal choice, freedom, and spontaneity among visiting publics

**Management Suitability and Capability.** The degree to which each alternative:

- affects the commemorative integrity or legislated purpose of the area
- affects public health and safety or contributes to public risks
- addresses consequences of delaying or not taking action
- can be changed or adapted, given new science, information, or circumstances
- complements other important resource uses, users, or values (e.g., educational, commercial, research, extractive, restoration)
- establishes a precedent for future action
- represents a future decision or commitment in principle
- has cumulative effects that are likely to be significant
- requires reallocated or increased resources in services, personnel, facilities, programs, or equipment
- is administratively feasible (e.g., budget, personnel, equipment, facilities, O&M standards)
- affects other management programs and services
- has consequences that can be mitigated (i.e., avoid, minimize or limit extent, compensate, restore, rehabilitate, reduce, or eliminate)

## Reasonable recreation boating capacity coefficients

To help managers make better and more defensible boating capacity decisions, a set of boating capacity coefficients has been developed based on collaborative expert opinion, professional experience, published articles and plans, sound professional judgment, the rule of reasonableness, and the sliding scale rule of analysis discussed in chapter 1 of this guidebook. The boating coefficients in Figure 24 would be reasonable for a Level 1 analysis (see Figure 9).

*A boating capacity coefficient is defined as the number of water surface acres adequate for each recreational boat in a particular WROS class.* These coefficients can be multiplied by the suitable or available water surface acres for each WROS class on a body of water to help justify and defend a boating capacity decision. Additional scientific study and monitoring can help refine these boating capacity coefficients.



Boating capacity decisions are important.

*A boating capacity is defined as the number of recreational boats at one time (BAOT) that will be accommodated in an area, or the BAOTs for an area.* BAOT refers to the number of boats that are untethered from the shoreline or any docking apparatus whose occupants are pursuing recreational opportunities. The following coefficients do not account for the inactive recreational boats moored at a dock, marina, or along the shoreline, nor do they account for non-recreational boating activity (e.g., commercial fishing, shipping, and law enforcement).

Because of the many factors that influence a boating capacity decision, a range of reasonable coefficients is provided for each WROS class in figure 24. A decision tool is also provided in figure 25 to help ensure that important factors are duly considered by managers deciding what part of the range may be most appropriate for the area in question.

**Figure 24. A Range of Reasonable Boating Capacity Coefficients**

WROS Class	Range of Boating Coefficients	
	Low end of range	High end of range
Urban	1 acre/boat	10 acres/boat
Suburban	10 acres/boat	20 acres/boat
Rural developed	20 acres/boat	50 acres/boat
Rural natural	50 acres/boat	110 acres/boat (1/4 sq. mi.)
Semi primitive	110 acres/boat	480 acres/boat (3/4 sq. mi.)
Primitive	480 acres/boat	3,200 acres/boat (5 sq. mi.)

**Figure 25. A Boating Capacity Range Decision Tool**

The purposes of this decision tool are to help ensure that managers consider important factors affecting boating capacity and to help document the reasoned analysis used in making a boating capacity decision. For each WROS zone, consider the following factors that may affect boating capacity. *Circle the descriptor that best matches the situation.* The preponderance of the answers will indicate which part of the capacity range may be more reasonable.

Typical size of boats	<15 feet	16 to 25 feet	>25 feet
Typical speed of boats	<10 mph	10 to 25 feet	>25 feet
Diversity of boating: 1. different types of boats 2. different size of boats 3. different speed of boats	low low low	moderate moderate moderate	high high high
Boater visitation pattern	simple/ predictable	moderate	complex/ unpredictable
Level of boater stewardship/ civility/respect for resource and others visitors	high	moderate	low
Shoreline configuration	simple/ circular	moderate	complex/ meandering
Boater destination or pass-through area	pass-through corridor/in-transit	mixed	destination area/overnight area
Extent of sensitive resources/ potential for impact	low	medium	high
Compatibility with adjacent recreation/non-recreation land uses	high	moderate	low
Islands/shallows/hazards	infrequent	occasional	frequent
Historic public safety record/ accidents/complaints/conflicts	infrequent	occasional	frequent
Level of boater management/rules/ information/education/compliance	high	moderate	low
Other factors:			
<b>Suggested capacity range</b>	<b>lower end (more boats)</b>	<b>mid-range</b>	<b>higher end (fewer boats)</b>

