



# Best Practices for Sustainable River Recreation Management for the Verde Valley

*Protecting Natural Resources, Enhancing Recreation, and Boosting Economic Development*

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# Best Practices for Sustainable River Recreation Management for the Verde Valley

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## About American Rivers

American Rivers protects wild rivers, restores damaged rivers and conserves clean water for people and nature. Since 1973, American Rivers has protected and restored more than 150,000 miles of rivers through advocacy efforts, on-the-ground projects and an annual America's Most Endangered Rivers® campaign. Headquartered in Washington, DC, American Rivers has offices across the country and more than 250,000 members, supporters and volunteers.

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## Disclaimer

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# Table of Contents

Executive Summary	4
Part 1: The Verde River	7
Recreation Trends and Challenges	7
Recreation Trends and Usage	8
Challenge with Current Recreational Use	10
Part 2: Best Practices for Managing Recreation and Preserving Resources	11
Defining Recreation Capacity and Establishing Standards	11
Framing the Approach to Sustainable Recreation Management	14
Engineering Best Practices	14
Site and Facilities Planning and Design	15
Access Management: Transportation and Parking Design	16
Education Best Practices	18
Signage	19
Other Education Tools	21
Enforcement Best Practices	22
Monitoring Best Practices	23
Funding Sustainable Recreation Management	25
Part 3: Implementation of Best Practices in the Verde Valley	26
Existing Collaborative Efforts to Improve Opportunities and Management Needs	27
Verde Valley Recreational Priorities	28
Recommendations for the Verde Valley	30
Recommendation #1 - Conduct a Comprehensive Recreation Capacity Analysis	31
Recommendation #2 - Focus Recreation Site Design on Watchable Wildlife	33
Recommendation #3 - Establish a Coordinated Permitting System	34
Recommendation #4 - Establish an Ongoing Monitoring Plan	35
Conclusion	36
Endnotes	37
Sources Used in the Report	38
Appendix: Additional Resources	39

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# Executive Summary



**The Verde River** in north-central Arizona is a precious gem – a silvery thread that winds its oasis of life through a remote desert environment. One of the last healthy, perennially flowing river systems remaining in the state, it is home to rare cottonwood-willow gallery forests, abundant wildlife, migratory and resident bird species, significant archaeological and historic resources, and vibrant communities. For many years, the Verde River, valued for its healthy riparian habitats and wildlife, has remained relatively unknown outside of the region as a recreational destination. Until now.

The Verde Valley communities of Sedona and Jerome have been popular tourism destinations for decades. The high volume of visitors has meant that over the years these communities have had to work to address visitation issues (such as traffic, housing for service staff, and the encroachment of development on open space). Although the broader Verde Valley has generally remained out of the public eye and undiscovered by tourists, that is rapidly changing. Across the Verde Valley, there is an array of new initiatives to improve recreation opportunities, foster economic development, and build a healthy economy. The communities of Cottonwood, Clarkdale, and Camp Verde, and the Yavapai Apache Nation, have all engaged in recreation planning in recent years as interest in outdoor recreation continues to rise. Visitation to the Verde Valley is growing, and the residents, spectacular open space, and wildlife are experiencing the effects of these changes.

Our goal is to help the Verde Front advance its mission to manage and expand sustainable recreation opportunities, enhance geotourism and economic development, and protect the natural resources of the Verde River and the surrounding Valley.

This report is intended to assist the Verde Front with recommendations and resources to develop sustainable river recreation management strategies. The Verde Front is a collaborative initiative composed of people from local communities, public land agencies, nonprofits, and other local stakeholders working on sustainable recreation and improving tourism to the Verde Valley. Our goal is to help the Verde Front advance its mission to manage and expand sustainable recreation opportunities, enhance geotourism and economic development, and protect the natural resources of the Verde River and the surrounding valley. Over the past year we have researched sustainable river recreation best practices and interviewed recreation management experts from across the country to help inform this document.

In this report, we highlight best management practices for sustainable recreation development. We also identify

successes from communities across the country and what they have done to mitigate the impacts of recreation in river corridors. In addition to identifying practices regarding carrying capacity, education, engineering, and enforcement, we also explore opportunities for their direct implementation in the Verde Valley.

Based on our research on sustainable recreation management and conversations with the River Recreation Working Group of the Verde Front, we have also developed recommendations focused on where the communities of the Verde Valley can further implement and improve sustainable management. All of these recommendations need to be further discussed within the larger Verde Front initiative, and be pursued collaboratively to ensure the Verde River is protected for generations to come.



PHOTO CREDIT: FISHING ON THE VERDE RIVER | SUSAN CULP

Specifically, we've identified four necessary steps to improve recreation management.

Recommendation #1 - Conduct a Comprehensive Recreation Capacity Analysis

• Although recreation capacity has been examined and thresholds identified for a handful of stretches along the Middle Verde River, a full analysis along the entire stretch from Sycamore Canyon to the Wild & Scenic reach, including major tributaries, has not been completed.

Recommendation #2 - Focus Recreation Site Design on Watchable Wildlife

• Many locally-driven recreation plans have identified improving wildlife viewing as a high priority of residents and economic development staff. As opportunities arise to develop watchable wildlife river recreation sites such as Homestead Park and other sites, the local communities should work together to design and develop recreation amenities that are within the Recreation Opportunity Spectrum (ROS) guidelines.

Recommendation #3 - Establish a Coordinated Permitting System

• The coordination of valley-wide permits and day use fees for both commercial and private trips is a challenge. Currently, different reaches of the Verde and individual river access points have separate commercial permits and day use fees.

Coordinating initiatives across the Middle Verde River for both of these efforts could reduce confusion around regulations and permits.

Recommendation #4 - Establish an Ongoing Monitoring Plan

• As the Verde Valley moves forward with sustainable recreation management practices, and as new recreation planning projects and priorities are implemented, a monitoring group should be established. This group should help complete a monitoring plan to protect the Verde River and surrounding lands.

Not only will the strategies and best practices in this report help protect the natural environment, they will educate visitors on ways to sustainably support the Verde Valley, surrounding open space, and world-renowned vistas and views. The report includes an Appendix that references supplemental information to help communities in the Verde Front and the Verde Valley better understand sustainable recreation management. Such information includes links to references for information on funding opportunities, a five-step guide to sustainable river recreation management planning, a comprehensive list of supporting reports for management and monitoring, and specific examples from other communities across the country.



PHOTO CREDIT: VERDE RIVER | DOUG VON GAUSIG

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# PART 1: The Verde River

The Verde River is a rich, vital lifeline to one of the most distinctive areas in the American Southwest. Running through the heart of Arizona, it is an oasis in an arid desert environment. The Verde River provides critical water supplies for communities and agriculture, supports countless wildlife species and rich riparian habitats, and is a hotspot for popular outdoor recreation both in the river and along its edge. The Verde River supports many communities in fast-growing Yavapai County.

The Verde River trickles out of the mountains above Paulden, Arizona, in the Chino Valley and flows east through the Sycamore Canyon Wilderness Area before veering southeast through the Verde Valley. After flowing through Camp Verde, the Verde bends southward through the Mazatzal Wilderness Area, finally draining into the Salt River just outside Phoenix, the state's largest metropolitan area. Riparian corridors along the Verde and its tributaries support rich wildlife, including an astonishing diversity of migratory and resident birds; endangered, threatened, and sensitive species; and some of the rarest riparian forest communities in North America.

But the Verde River is unlike many other rivers in the West that support recreation. As a perennial river, it is vitally important in this arid desert region, even though it is relatively small. Its flows are typically 15 to 20 cubic feet per second (cfs) in its upper reaches, 60 to 160 cfs in the middle stretch running through the Verde Valley, and only 100 to 200 cfs in the lower Verde as it flows into the reservoirs of Horseshoe and Bartlett Lakes. Verde River flows vary considerably by season, with low periods during the hot, dry summer months that often make recreational boating difficult. Seasonal floods from spring runoff, during late summer monsoons, and other storm events can increase flows of the Verde dramatically, sometimes dangerously, and these floods often damage infrastructure and recreational improvements, and create other hazards.

Despite fluctuations in river flow, recreational use of the Verde River, including kayaking, canoeing, birdwatching, fishing, and hunting, is on the rise. Economic development opportunities associated with recreation are also increasing for Verde Valley communities. A number of regional festivals, including the

Verde Valley Birding and Nature Festival, draw hundreds of participants to the Verde Valley from across the nation. Visitors stay in local hotels, eat at local restaurants, and hire tour guides and other services, bringing significant revenue to the rural communities across the Verde Valley. Earth Economics, a non-profit, nonpartisan organization that conducts science-based economic studies and provides policy recommendations and consulting services, released a report in 2016 that estimated direct spending in the Verde River watershed related to outdoor recreation at \$196 million annually, supporting more than 2,600 jobs. There is little doubt that recreational use of the Verde and its surrounding lands is an important contributor to the economic prosperity of the region.<sup>1</sup>



PHOTO CREDIT: FUN ON THE VERDE RIVER | DOUG VON GAUSIG

## Recreation Trends and Challenges

The greater Verde Valley has long been a popular sightseeing and recreation destination. Communities have started developing their own distinctive attractions, including river access points, vineyards and wine tasting rooms, revitalized downtowns, and festivals. Locally run businesses are beginning to appreciate the economic impact of these activities and are building new relationships that support the Verde River as they acknowledge its recreational, scenic, and economic values. Wineries supporting sustainable water use and protection of the river have located to the area, converting agricultural lands with historically water-intensive crops into high-value vineyards.

## Geotourism

National Geographic defines a geotourism as tourism that sustains or enhances the distinctive geographic character of a place—its environment, heritage, aesthetics, culture, and the well-being of its residents.

These farm-based operations, and the tasting rooms they have opened in revitalized downtowns, are contributing to a blossoming wine industry that draws new tourism to the region. Other agricultural producers are exploring innovative ideas to improve water efficiency, lessening the impact on Verde River flows and supporting a vibrant local food movement.

These recent developments, along with the region's unique cultural history and commitment to sustainability of local businesses, led National Geographic to identify the Sedona Verde Valley as one of about 20 international geotourism worldwide destinations. National Geographic defines geotourism as tourism that sustains or enhances the distinctive geographical character of a place – its environment, heritage, aesthetics, culture, and the well-being of its residents. The Sedona Verde Valley was listed as a geotourism destination after community collaboration promoted economic growth and tourism while also encouraging protection and restoration of Verde's amazing natural resources.

Community leaders recognize that the National Geographic geotourism designation may further intensify recreational impacts on the Verde River and increase the risk of environmental damage to this ecologically important region unless holistic, regional plans to sustainably manage recreational use are implemented. The focus of this report is on recreational use trends associated with on-river and near-river recreation, and the impacts of this recreational use on the Verde River and sensitive riparian habitats that many wildlife species depend upon for survival.

### Recreational Trends and Usage

Historically, recreation in the Verde River corridor had been confined mainly to independent, private outings by locals and visitors who are aware of the spectacular opportunities offered by the Verde River. Commercial activities are on the rise in the Verde Valley, and the most popular stretches of the Verde River for recreational boating, particularly private trips, include:

- Verde River @ Clarkdale, a nearly 4-mile stretch of boatable flows running through the town of Clarkdale, managed in

coordination by both Clarkdale and Arizona State Parks

- Upper-Middle Verde, running from United States Forest Service (USFS) Black Canyon River Access Point (RAP) to Bignotti Beach, located downstream from the city of Cottonwood and managed by Prescott National Forest

- Lower-Middle Verde, running through the town of Camp Verde from White Bridge RAP to Beasley Flat, managed by the Prescott National Forest

- Wild & Scenic Stretch of the Verde River, extending from Beasley Flat RAP downstream of Camp Verde, through the Mazatzal Wilderness, terminating at the Sheep Bridge RAP. This is an especially popular reach for experienced paddlers. The Wild & Scenic stretch is managed cooperatively by Coconino, Prescott, and Tonto National Forests. The River Special Use permits, including Outfitter and Guide, and Recreation Event permits are administered by the Prescott National Forest.

Recreational boating is growing in popularity in the Verde Valley. Currently, four outfitting companies operate commercial tours on the Verde River, that number having doubled in recent years. The Verde River also attracts private boaters. On average, local outfitters estimate more than 20,000 paddle trips running through the middle stretch of the Verde River each year, a figure that includes both commercial outfitter excursions and trips by private boaters. Visitation numbers increase considerably when paddle trips along the Wild & Scenic stretch of the Verde River are included.

Two significant local events have increased attention and interest in recreation opportunities along the Verde River. The Verde Valley Birding and Nature Festival is recognized as one of the best birdwatching events in Arizona and will be entering its 17th year in 2017. It regularly draws hundreds of birdwatchers from around the world to the Verde River and surrounding areas. The Verde River Runoff, a kayak and canoe race once known as the Verde River Canoe Challenge, has also been held annually for nearly 20 years. Both of these events have grown since their inception and are popular events for residents and tourists alike.

## Recreation Capacity

(Also known as visitor capacity or carrying capacity) can best be defined as the maximum amount of recreation use and resulting impacts that can be accommodated in a park or outdoor recreation area without unacceptable change to natural and cultural resources and quality of the visitor experience.<sup>3</sup>

Businesses directly involved in marketing recreational activities along the Verde River are primarily outdoor adventure and outfitter operations offering nonmotorized watercraft rentals and guided kayak tours for visitors. One of the first, Verde Adventures, began operating commercially guided kayak tours along the Verde River, and others arrived shortly thereafter. Growing from a relatively small cadre of casual private boaters to accommodating significant commercial recreational activity has been both a tremendous opportunity and challenge for Verde River communities. Until recently, developed access points to the Verde River for boating, hiking, and wildlife viewing were in very short supply. Today, the number of access points has increased, yet most are still primitive, with few amenities such as restrooms, trash receptacles, boat ramps, and other recreational improvements.

The town of Clarkdale was one of the first Verde Valley communities to develop river access points and issue commercial recreational permits the reach that runs through the town at the Verde River @ Clarkdale. In Clarkdale's first commercial season, April through November of 2014, more than 6,500 people participated in guided commercial tours.<sup>2</sup> A 2014 capacity study on commercial boating, developed for the town of Clarkdale, found that nearly 250 people per week launched from the Lower TAPCO RAP during this time. The report estimated that commercial outfitting and educational group excursions accounted for 60 to 75 percent of river usage, with the balance coming from private boaters.

The presence of commercial tours continues to expand to new stretches of the Verde River. One of the first commercial outfitters, Verde Adventures, ran its commercial trips from Clear Creek RAP to Beasley Flat below Camp Verde. With the success of this run, Verde Adventures added a "Water to Wine" tour, running from U.S. Forest Service river access points just downstream of Cottonwood to Alcantara Vineyards, just upstream of the Oak Creek confluence. After Clarkdale developed its RAPs, commercial trips blossomed along the

Clarkdale stretch. In 2015, one of the major outfitters operating kayak excursions on the Verde River @ Clarkdale reach expanded operations to lower stretches of the river downstream from Cottonwood and in Camp Verde.

Data from the town of Clarkdale is readily accessible and provides accurate statistics on commercial use of the Verde River for the 4-mile stretch from the Lower TAPCO to Tuzigoot river access points. Four outfitters are now permitted by Clarkdale to run commercial trips on the Verde River – CenterFocus Experiences, Clarkdale Kayak Company, South by Southwest, and the Verde River Institute. The number of commercial trips in Clarkdale reached 1,800 as of mid-2016, with a projection of 3,600 trips by the end of 2017. While this does not yet exceed the capacity limitation adopted by the town of Clarkdale, growth in the outfitter sector in the Verde Valley demonstrates the need for management as the numbers continue to rise.

Clarkdale's early development of a recreation-based economy centered around the Verde River @ Clarkdale has had its benefits and challenges. Local businesses have benefited from increased visitation, yet determining carrying capacity and managing recreational use on the Verde River has been challenging because it is a relatively small river that flows through residential neighborhoods. It is not easy being the trendsetter, but early adopters often serve the greater good by identifying challenges and pioneering potential solutions.

The highest volume of commercial tour activity actually occurs downstream from Clarkdale. According to local outfitters, interest in the popular Water to Wine tour, and the stretches of the Verde River running through the town of Camp Verde, has grown significantly. Verde Adventures and Sedona Adventure Tours began operating commercially guided trips along the USFS-managed reaches of the Verde River (Skidmore Lane to Beasley Flats) in 2007. Currently these are the only two outfitters authorized to use these access point on this reach of the Verde. User statistics for the different reaches are not well known, and at this point a carrying capacity has not been identified. However, the USFS is conducting a capacity analysis for the Middle Verde, to be completed by September 2017.

Commercial and private boating trips do not capture the full range of river-related recreation along the Verde. Birdwatching, hiking, horseback riding, fishing and hunting, motorized recreation, and other activities are also commonplace. However, it is difficult to track the extent of these activities since permits are not required, and statistics and user data are not currently collected. Some information is becoming available through Arizona State Parks and the Forest Service.

### Challenges with Current Recreational Use

The middle stretch of the Verde River flows generally southeast through the three communities of Clarkdale, Cottonwood, and Camp Verde. Land ownership along the river is a mix of federal public lands, parks, and state natural areas managed by Arizona State Parks, municipalities, and private lands. With the growth in recreation in these communities, some riverfront property owners have seen a dramatic increase in on-river traffic from private boaters and commercial outfitters, and hikers and equestrians crossing private lands as they walk or ride along the river. In some cases, this has generated concern about private property rights and the impacts of noise, trash, and safety issues.

The town of Camp Verde recently engaged in an extensive master planning process, where a concerted effort was made to identify and respond to concerns and challenges experienced by riverfront property owners. Most frequently, complaints raised by those living in residential neighborhoods adjacent to the river concerned pollution, trash, and illegal ATV traffic in the river corridor. Trespassing, property theft, and property damage were frequently cited problems, along with traffic and parking in residential neighborhoods. Residents also expressed concern about how these issues affect the natural aspects of the Verde River and its wildlife.



PHOTO CREDIT: DAY FEE STATION  
VERDE RIVER | FAY AUGUSTYN

Impacts from recreational use on riparian habitat and wildlife in the Verde River corridor are concerns for land managers, nonprofit organizations, and residents. Sedona's experience with large crowds, traffic congestion, and water quality impacts to Oak Creek serves as a cautionary tale for nearby Verde Valley communities. Fossil Creek, a Wild and Scenic River and tributary to the Verde River, was nearly loved to death and has made local communities wary of moving forward quickly with recreational development.

There are many ways to plan for and manage recreational use so that enjoyment of the resource is optimized and the resource is sustained. Best practices discussed in the following sections will provide proactive strategies to help balance recreational use, economic development, and protection of the natural, cultural, and historical values of the Verde Valley.

## Sedona Tourism

Tourism in the Sedona area is one of the primary drivers of the regional economy, with over 4 million people per year coming to Sedona to experience the area. The large amount of visitors, while contributing to local businesses and the economy, has also had impacts on local natural resources – including traffic congestion in the relatively small city and in Oak Creek Canyon along 89A, overcrowding at some of the most popular trails and recreational sites, and impacts to water quality. Oak Creek is in non-attainment of both the Environmental Protection Agency and Arizona Department of Environmental Quality water quality standards for E. coli, largely because of the significant recreational use. Oak Creek Watershed Council, a local nonprofit group, continues to work tirelessly to install and monitor pet waste stations, maintain toilets at recreational sites, and conduct cleanup projects and water-quality monitoring.

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# PART 2:

## Best Practices for Managing Recreation and Preserving Natural Resources

Interest in outdoor activities, and in particular river-related recreation, has grown significantly in the past few decades. Increased enjoyment of America's rivers has both positive and negative effects on natural resources and on the communities adjacent to these recreational and natural treasures. Across the country, communities are developing strategies to deal with expanded use in and along their local rivers. This section discusses a variety of proactive approaches to sustainable recreation management that have been successful in other communities and may be applicable to the Verde River and Verde Valley communities.

### Defining Recreation Capacity and Establishing Standards

Capacity management to preserve natural resources and ensure a quality user experience can be a difficult thing – both in identifying an appropriate capacity level and developing management tools to ensure use does not exceed that capacity. A useful context for thinking about recreation capacity is the Recreation Opportunity Spectrum (ROS), developed by the USFS as a framework for understanding different classifications of intensity of use and development at recreation sites. The ROS sets definitions and parameters for recreational experiences on a spectrum that ranges from primitive to urban, based on features such as access and remoteness, naturalness, social encounters, and visitor experience. These range from feelings of isolation, solitude, and self-reliance on one end of the spectrum, to visitor security, comfort, and site development at the other.

Appropriate recreational capacity levels can be determined by evaluating where a particular site or resource may land on this spectrum. This defines how much hardscape development, access, and desired number of social encounters and impacts to the environment are acceptable for a given recreational site. If the priority is to provide for recreational opportunities that are compatible with a sense of remoteness, protection of natural habitats, low levels of social encounters, and low-impact development, resource managers may choose to

manage a site at the more primitive end of the ROS spectrum. On the other hand, if the priority is to provide a place for community gatherings and socializing, a higher-intensity and more programmed development at the rural/urban end of the spectrum may be more appropriate.

- Primitive – characterized by wilderness, nonmotorized trails or cross-country travel, lack of developed facilities, high degree of solitude, low number of social encounters, unnoticeable or very low impact on wildlife habitat and vegetation, and no on-site controls and information

- Semi-Primitive (Non-Motorized) – characterized by cross-country or nonmotorized trails, distant from the sight and sound of human activity, rustic facilities, reasonably low number of social encounters, limited impact on wildlife and vegetation, low on-site controls and information

- Semi-Primitive (Motorized) – allows for motorized trails and primitive roads; relatively distant from the sight and sound of human activity; rustic facilities including some comfort and site protection related facilities; moderate levels of contact on roads, trails, and recreation sites; with on-site controls, information, and facilities that harmonize with the landscape

- Rural – not particularly remote; some facilities primarily for user comfort and convenience (e.g., ramadas, restrooms, campsites); moderate to high numbers of social contact on trails, roads, and at facilities; site hardening and impacts to wildlife and vegetation via some development; visitor management and controls obvious and numerous, with more complex information resources

- Urban – full access to all areas; sites are not considered remote; facilities largely designed for user comfort, convenience, and socializing; large volume of users and high numbers of social encounters; site hardening common; visitor regimentation, information, and controls numerous<sup>4</sup>

## Some Useful Definitions<sup>5</sup>

Recreation capacity (also known as visitor capacity or carrying capacity) can best be defined as the maximum amount of recreation use and resulting impacts that can be accommodated in a park or outdoor recreation area without unacceptable change to natural and cultural resources and the quality of the visitor experience.

Indicators are generally referred to as the variables selected to represent natural and cultural resource, experiential or managerial conditions in a recreation setting.

Capacity threshold is the level of impact at which impairment to the natural and cultural resources and the visitor experience occurs.

Standards define the thresholds for each indicator, and draw the line between “acceptable” and “unacceptable,” “desirable” and “undesirable,” and “high-quality” and “low-quality,” depending upon the situation. The terms “thresholds” and “standards” are often used interchangeably in relation to key indicators.

In determining a sustainable capacity for recreational use, a predevelopment evaluation of the resource’s values is required. Careful analysis of the river corridor, including habitat characteristics like plant and animal life, seasonality and precipitation trends, and cultural resources, is needed to understand potential impacts to the river and recreation area. Cultural characteristics to consider include presence of historical artifacts and their fragility and significance, current recreational or spiritual use, as well as other significant features with social values in the river corridor. Evaluation should be conducted in a manner that allows for seasonal variations in use and pressure, allowing for a full assessment of the river corridor. Monitoring and evaluation, when tied to clear management objectives, will help define indicators that determine recreation capacity and may signal when that capacity is being exceeded.

Some of the indicators that affect the determination of the capacity range include:

- Land Type – topography, productivity, resistance to compaction, and geology of the area
- Vegetation – height, density, resiliency, and screening capacity of vegetation
- Social – number and types of social encounters or contacts, types of activities supported, and design capacity of the site
- Other Factors – access, seasonality, patterns of use, occupancy length, and attractiveness of the site for various activities<sup>6</sup>



PHOTO CREDIT: NEW ACCESS POINT ON VERDE RIVER | ALTRIA

The use of specific, measurable indicators can inform an adaptive management strategy. Additionally, the use of indicators consistently over time can improve the ability to sustain ecological and cultural resources while providing a high-quality experience. When identifying appropriate indicators for evaluating capacity management, the following should be considered:

When identifying appropriate indicators for evaluating capacity management, the following should be considered:

- Unit of Recreational Use – the number of people or boats that may be on a river at any given time<sup>7</sup>
- Timing – the amount of use per hour, per day, or per week
- Geographic Boundary – the space for which capacity is assessed including general geography, such as a park boundary or specific location like a rapid or access point, larger areas that support a diverse range of recreational activities may have multiple capacities within their boundaries depending on the type of resource, kinds of recreational use, and the natural values being protected (e.g., a park may have a limited capacity for camping and overnight use but a higher capacity for day-use hiking)

- Environmental Conditions – water quality and quantity, local wildlife habitat, and native or threatened/endangered species are important. Limitations on the suitability of certain areas for recreation, such as foot traffic, paddling, etc., should be evaluated

- Recreational Experiences – how much use a river currently receives and the types of recreation and available access points

- Management System – the determination of who is responsible for maintenance and emergency response and how much it costs and the number of staff and the amount of resources that are needed for the area to be maintained, repaired, and actively managed

The development of indicators and standards will help determine the necessary management actions for the Verde River. Based on the indicators and standards, recreational capacity can then be determined as the maximum amount of visitor use.<sup>8</sup> To inform the management effort, continual monitoring and evaluation of the prescribed activities in the plan should be conducted to inform the future management of the Verde River.



PHOTO CREDIT: KAYAKING THE VERDE RIVER | ALTRIA

## Framing the Approach to Sustainable Recreation Management

Once the capacity of a recreational site, including the appropriate level of development, is established, planners can develop and design the site for maximum user enjoyment while also protecting important resource values. When designing and developing amenities, and creating management plans to improve recreation and protect the river resources, many recreation planners use the “Three E’s” framework – Engineering, Education, and Enforcement – as a guide to development of management actions.<sup>9</sup>

### Engineering Best Practices

Engineering refers to the thoughtful, technical design of river access, signage, and other recreational amenities, development, and infrastructure. Intentional design of river recreation sites encourages ethical and responsible river use, and promotes self-regulation of crowds and recreational behavior in desired patterns. There are numerous ways to design a site that promotes capacity management, ranging from low-impact design to minimize the footprint and impact of facilities on the natural landscape, to transportation and parking strategies and entrance management to assist with maintaining appropriate visitor use levels.



PHOTO CREDIT: NEW ACCESS POINT CONSTRUCTION ON THE VERDE RIVER | ALTRIA

### Managing Fossil Creek, AZ

Fossil Creek is one of the major tributaries to the Verde River in central Arizona. After an aging dam was decommissioned in 2005 and healthy flows returned, Fossil Creek was designated a Wild and Scenic River in 2009. With restored flows, recreation on Fossil Creek skyrocketed from 20,000 visitors to over 80,000 by 2013.<sup>13</sup> Recreation managers became quickly overwhelmed by the challenges that the growth in recreation and visitation brought, from trash dumping, illegal fires, and camping activities to an increase in search-and-rescue operations to aid unprepared visitors. With limited parking availability at recreational sites, many users would endure a multi-hour drive to Fossil Creek, only to find long lines, congestion, and lack of parking once they arrived. After several years of high-impact use, and issues and visitor behaviors that were degrading the resource, managers completed a river management plan. In 2016, a visitor reservation system, a type of permitted use system, was enacted to manage capacity. The Coconino National Forest implemented the system, allocating 148 total parking spots at recreational access points along Fossil Creek on a first-come, first-served basis for a cost of \$6 – allowing up to six permits per year for individual visitors. The program was successful over its first pilot period of 2016, leading to enhanced visitor experiences and better protection of Fossil Creek and surrounding lands.

## Sweetwater Creek State Park, GA

Located just outside of Atlanta, Georgia, is home to a small creek with endless opportunities to hike, fish and canoe, and it is also home to one of the most energy-efficient visitor centers in Georgia. Designed to reduce its energy and water footprint, the visitor center at the park is powered by solar panels, equipped with rainwater-harvesting technology, and plumbed with a compostable toilet system. The solar array atop multiple roofs in the park provide 20 percent of the visitor center's energy needs, and the overall energy consumption of the building is 51 percent less than other comparable buildings.<sup>14</sup> The compostable toilets and rainwater-harvesting system reduce water consumption by 77 percent. Not only does Sweetwater Creek State Park's visitor center provide a lot of environmental benefits, but it also educates its users about the unique design of the building and its importance in conservation.

### Site and Facilities Planning and Design

Designing the site properly makes it possible to manage the number of visitors and enhance their experience. Proper site design establishes reasonable expectations for use, while also protecting natural resource quality (e.g., it limits erosion, trash, pollution, and water quality issues). Site design and facilities should be geared to provide the type of recreational experience, and attendant amenities (or lack thereof), that fits with the natural resources of the site and meets the recreation opportunity goals. Considerations include a quiet, wilderness-oriented experience at a more primitive site, or a hub for community gathering, festivals, and more gregarious recreational uses with larger parties of people in both urban and rural communities.

The type of amenities available at access points should be determined based upon the anticipated use and capacity for the number of visitors. Recreation sites including more developed amenities, such as toilets, campsites, potable water, and parking, often encourage greater use. Those that are less developed, with just a single toilet, or no facilities, are less accessible to a range of visitors. When amenities are not developed, it is important to include signage to educate users about the importance of packing out trash and to instruct them about what to do with waste. Site and facility design should minimize the impact of development on the natural features of the area, support the protection and preservation of those natural resource values, and reduce the cost of long-term maintenance and operation of the site. The list below is by no means comprehensive, but it identifies many of the site design best practices to accomplish these goals. Links to additional information are included in the Appendix.

Best Practices to Consider Include:

- Avoid development in areas with sensitive habitat or that are located in hazardous/flood-prone areas. Seek to minimize impacts to scenic views, water resources, and other natural features. Evaluate the ecology, land, soil type, and wildlife.
- Use park and recreational amenity design to provide for stormwater retention and groundwater recharge, including use of bioswales and pervious surfaces to protect water quality and quantity, promote groundwater infiltration, and recharge and limit erosion.
- Use locally sourced, recycled, or sustainable building materials. Design features should reflect local values and historical character and blend with the surrounding environment.
- Plant native vegetation at recreation sites and remove nonnative plant species.
- Incorporate rainwater harvesting, graywater, or recycled water and irrigation efficiency when irrigation is necessary.
- Use materials that are durable, resilient, and inexpensive to repair or replace, especially in areas prone to seasonal flooding or other hazards
- Incorporate renewable energy methods, such as solar and wind, to minimize maintenance-related costs and provide power to remote sites, when possible

Appropriate capacity and use levels should be defined prior to beginning site design. This will aid in incorporating suitable elements in the development of recreational site amenities. For areas that currently experience, or will likely experience, high volumes of recreational use, it is essential to provide adequate facilities to protect natural resource values. For example, if water quality impacts are at risk of exceeding safe standards, providing toilets and pet waste stations will assist with managing or preventing those problems. Similarly, trash receptacles promote proper waste management and prevent littering.

## Access Management: Transportation and Parking Design

Accessibility to recreational sites should be planned and designed to meet the specific user needs based on the ROS spectrum described previously, and the plans should address appropriate recreational uses and capacity. The USFS and other federal agencies develop travel management plans associated with their recreational sites, which consider the impacts to natural resources and ability to meet recreational demand. There is often an inherent tension between improved access, protection of natural resources and wildlife, and the quality of the recreational experience for the visitor. Management of access via transportation can be a powerful way to ensure that natural resources vital to recreation are used appropriately and capacity is maintained at sustainable levels.

The most basic means of using transportation to manage visitation involves the development of roads, trails, and paths that provide access to recreational resources, and the parking available (or unavailable) at those sites. As described in *Using Transportation to Manage Recreation Carrying Capacity*, “The extent of road and trail networks, availability of vehicle parking, and location of transit routes are key determinants of where and how much visitor use occurs throughout the park.”<sup>10</sup> It goes on to say, “In shaping where visitors go in parks and

when they go there, visitation and crowding at recreation sites can be understood as a function of the transportation systems and facilities that provide access to sites.”<sup>11</sup> These relationships are critical to managing recreational use in a manner that meets sustainable recreation planning and management goals.

Entrance kiosks at roads and trails are an important means of managing capacity. If used strategically, they help control the number of users and regulate the pace of visitation to reduce crowding by limiting the number of visitors. In many cases, entrance points offer space for educational and interpretive information to enhance the user experience.

Depending upon the planned level of development at a particular site, different types of road, trail, and access development may be appropriate. For remote and/or sensitive sites, hiking, nonmotorized biking, or equestrian trails may be the extent of access provided. For areas where higher-intensity use is planned, vehicular access via roads, with adequate parking facilities, along with trails suitable for handicap accessibility, may be more appropriate. However, even for those areas that are deemed appropriate for vehicular access and high levels of use, providing multimodal means of accessing those sites can reduce traffic and congestion while still allowing for anticipated levels of recreational use.

### Mount Falcon Open Space, Jefferson County, CO

Jefferson County Open Space is a system of 29 regional parks on the western outskirts of Denver, Colorado, where hikers, bikers, and horseback riders enjoy 236 miles of trails year round. Among the strategies Jefferson County employs to accommodate users while preventing overuse is limited vehicle access. For example, one of the system’s most popular recreation areas, Mount Falcon Open Space Park, was visited by 130,500 people in 2008.<sup>12</sup> More than half of those visitors are hikers, and less than a third are bikers. The park provides convenient parking near the main trailheads, but the parking is limited to 115 cars. In addition, the county reduces potential conflict between users by managing trails for particular uses. For example, signage reserves some trails for hikers only, and boulders placed on some trails restrict access by horses or bikes.



PHOTO CREDIT: SIGNAGE DENOTING THE DIFFERENT TYPES OF USES AT MOUNT FALCON PARK, JEFFERSON COUNTY OPEN SPACE | FAY AUGUSTYN



When establishing a recreation access point, it is important to consider the types of recreation that are deemed suitable. The strategic placement of signage about appropriate use, or even hardscaping the site, can assist in managing the types of uses supported. Boulders or fencing placed at trailheads, or at the end of roads where vehicular access is restricted, can deter motorized vehicles and ATVs from accessing the site, limiting the area to pedestrian or other human-powered recreation. Such strategies may also be used to reduce access to sensitive habitats, or to areas where revegetation and restoration efforts are ongoing to stabilize streambanks or prevent erosion.

Best Practices to Consider Include:

- Low-impact recreation for sensitive areas such as wilderness-character backcountry, including hiking, nonmotorized biking, equestrian, and other low-impact trails for access. Properly designed and managed trail systems can limit the proliferation of social trails, or informal, nondesignated trails between two locations. These informal trails often result in trampling of vegetation that has negative effects on wildlife habitat and soil stability. Although they are unwanted, social trails may provide important clues for determining demand and popularity of a specific area, how it is intuitively used, and where new trails should be considered.
- Multiple methods for site access when capacity is limited for vehicular access and parking. Some parking and vehicle access

may be provided near the trailhead, but it could also be distributed by trail access originating from different locations, such as community centers or nearby parks, encouraging users to walk or bike to the recreational area.

- Access to sensitive areas, restoration sites, or river and stream banks prone to degradation through use of fencing, boulders, and other physical barriers.
- Shuttles and other transit options for high-use areas prone to overcrowding and traffic congestion. For example, Grand Canyon and Zion National Parks have successfully incorporated shuttle service to decrease vehicular traffic while still providing access to popular sites. In Glacier National Park, the use of the historic bus system is an added amenity that attracts visitors to the historic nature of the Park.
- Reservation and permit systems, similar to that implemented by Coconino National Forest, to manage traffic and parking challenges at popular destinations like Fossil Creek.

While each recreation resource is different, engineering and site design can significantly manage capacity, encourage proper use, and protect the natural landscape. The best practices listed above are just a few of the ways this approach can protect recreational resources and priceless natural treasures, and ensure a high-quality and memorable visitor experience.

## Education Best Practices

Education refers to elements of recreational planning that are focused on providing public information and awareness. Specifically, these techniques include education around safe river recreation practices; sustainable river use; and sharing knowledge of important historical, archaeological, wildlife, and other natural resources. Educational measures also deliver information about the location of public access points. Examples include trailheads, boat landings, parks, and other recreational sites, and the type of amenities and recreational activities available at a given recreation site, such as picnic areas and gazebos, grills and fire pits, trails, restrooms, trash receptacles, wildlife viewing decks, and river access points. Comprehensive signage should include directional signage to reach access points and the types of recreation that are supported.

Educational efforts are most effective when they are consistent yet incorporate multiple methods of reaching the public with information. Some examples include recreational opportunities; stewardship; critical safety information, such as the amount of time it will take to boat between river access points; the equipment and supplies needed for a safe recreational experience (whether the user is a hiker, boater, or birdwatcher); and etiquette. Educational efforts may reduce conflict between recreational users and private property owners adjacent to or near the recreational amenity by identifying and discouraging trespass on private lands.

Educational efforts may also encourage recreationists to be better prepared for their excursions, decreasing the likelihood they will need rescue. Moreover, such efforts may direct recreationists to observe “quiet zones,” avoiding disruption of peaceful residential areas or sensitive habitat.

Educational resources include a variety of strategies and techniques, such as directional, educational, and interpretive signage; maps; visitor guides; and destination or travel websites about the region. Local outfitters, outdoor adventure supply shops, chambers of commerce, and visitor bureaus can also be effective distributors of educational materials and information.



### Trail Signage in Durango, CO

Durango, Colorado's Trails 2000 is a nonprofit organization that provides consistent signage and trail maintenance for the community. Trails 2000 has installed trail signage at almost every trail intersection in the Greater Durango trail network. Signage illustrates where the user is within the trail system by including a “You are here” arrow and includes trail etiquette and “Leave No Trace” principles. To help educate the public, Trails 2000 hosts open trail maintenance days and youth engagement events, and sends weekly e-newsletters to community members.



## Signage

The National Park Service's guidance on recreational trail signage is worth considering in the context of all recreational signage: "Signs are probably the quickest and easiest way to leave the trail user with a positive impression. . . . Consistent signs are the quickest way to increase a trail's identity and the public's support for the trail."<sup>15</sup> Signage is a passive educational tool, relying on placement and design to attract attention and convey information. However, signage provides important education to users; creates a positive experience; enhances understanding of the important natural and historic values connected with the recreation site; controls usage for appropriate recreational activities; reduces conflicts; and provides a safer and more user friendly, environmentally friendly, and enjoyable recreational experience.

There is a variety of different types of information to include on signage that will provide important material to recreational users. On any given sign, a combination of the types of information below may be appropriate:

- Directional Information (including maps) – provides information to users about the locations of recreational sites, recommended traffic flow (whether motorized or nonmotorized), and other features
- Regulatory Information – contains instructions that recreational users must comply with (such as prohibitions against motorized vehicles on certain trails, designated campsites, or campfire restrictions)
- Safety Information – advises recreational users of hazards and location of supplies or equipment required for a safe recreational experience
- Educational/Interpretive Information – provides information about the natural resources, wildlife, history, and culture of a region, and is used to build awareness and appreciation of a particular feature<sup>16</sup>

## National Park Service Guide to Wayside Exhibits

According to the National Park Service's *Wayside Exhibits: A Guide to Developing Outdoor Interpretive Exhibits*, the best interpretive signage illustrates specific landscape features that drive the content and focus of the signage, and connect the recreational user to the place. The report<sup>18</sup> identifies key elements of effective wayside interpretive/educational exhibits:

- Compelling graphics and visual information
- Focuses the user's view toward the landscape or feature that is the subject of the exhibit
- Compelling title with interpretive text that is in an active voice, uses plain language, and tells a story

For signage to be effective, it must be easy to locate and recognized by recreational users. Signage consistency is critical to providing information that is easily interpreted and acted upon – particularly by visitors who may be unfamiliar with a particular area.

Best practices include:

- Placement
  - o Directional signage is best on main roads or highways leading up to and at the recreational area identified. Place signs in an easily visible location in the landscape. Consider context and consistency in areas where other signs compete for attention.
  - o Regulatory and safety signage should be placed at the recreational area itself. Signage restricting certain activities should be placed near the entrance to recreational areas for visitors to observe upon arrival. If there are hazards such as rapids, low head dams, or other challenges that could impact a boater's experience or safety, place signs at the river access point and near the upcoming hazard or danger.
- Visual Information
  - o Photos and infographics are effective in disseminating information, particularly for recreational areas with users who have difficulty interpreting text-heavy signage.

Interpretive and educational signage provides users with information about natural, cultural and historical significance of the recreational area and surrounding land. The following list highlights a few categories of information often included in educational and interpretive signage.

Best Practices Include:

- Natural history, including geology, ecological processes, plants, wildlife, and other natural resource values
- "Leave no Trace" practices
- Local and regional history and culture
- River etiquette, including best practices for on-river behavior
- Conservation efforts, successes, and opportunities to support efforts of local groups

Other Practices of Interpretive Signage that Should be Avoided, Include:

- Use of too many colors, styles and pictures on one sign
- Text-heavy signage with unreadable fonts
- Inclusion of long, complex stories
- Crowding too many logos onto one sign<sup>17</sup>

Signage design should stimulate a user's interest in the recreational site and surrounding landscape, while providing basic information. When effective, educational and interpretive signage can leave a stronger sense of place, create a deeper understanding of the natural environment, and encourage greater stewardship by recreational users.

Factors that Influence the Effectiveness of Signage Include:

- Size
- Legibility
- Visibility in the surrounding environment
- Context (i.e. location to hazard or to relevant location)
- Consistency throughout a recreation area

PHOTO CREDIT: HURON RIVER WATER TRAIL INTERACTIVE WEBSITE

**Tubing the Huron**  
Tubing has become a popular way to enjoy the river. If you are considering a trip through Ann Arbor's Argo Cascades, get essential info on best routes, parking, staying safe and having fun, whether you own a tube or need to rent one. [Details HERE.](#)

**Paddler's Companion**  
The second edition of our waterproof map flip book includes everything we loved about the original plus improved maps, a table of distances and float times for popular trips. There is a section featuring our five Trail Towns. It makes a wonderful gift! [Get it today.](#)

**Paddling Video**  
Let our newly released "Paddling the Huron River Water Trail" short documentary featuring three different sections of the river inspire your summer paddling adventures. [Watch It Here.](#)

## Other Education Tools

Signage at recreational sites is a critical way to reach recreational users, but other vehicles for providing information should not be overlooked. Public information about recreation should be available through a variety of channels, including websites, social media, printed maps and guides, etc. Designers should thoughtfully evaluate the various channels that members of the target audience will consume in order to convey the information most effectively.

Websites are an important means of communication and allow visitors to explore different recreational opportunities and understand how to be prepared for outdoor adventure outings. The websites that are most commonly accessed by river visitors are those that are maintained by federal or state land managers and that describe the landscape and recreation opportunities.

However, websites of other organizations – such as chambers of commerce, special visitor sites, local nonprofit organizations, and cities or towns – can also be effective places to share information. In the last 5 to 10 years, specific recreation activity websites have been created, such as MountainBuzz.com for kayakers in the West, 14ers.com for hikers in Colorado, and Singletracks.com for mountain bikers.

Printed brochures, travel guides, and maps are also useful. Maps marking recreational features, such as trailheads, boat access points, river hazards, archaeological and historic sites, and wildlife viewing opportunities enhance knowledge and improve safety and enjoyment of recreational experiences. These materials are typically most effective when the information is consistent across platforms and builds upon messages conveyed to recreationists about resource protection, safety, and sustainable recreational use.

## Huron River Water Trail, MI

The Huron River Water Trail is an inland paddling trail over 100 miles long connecting people to the river's natural environment, history, and the communities it touches in Michigan's Lower Peninsula. The Huron River Watershed Council and partners created this website as a way to engage the community and visitors to the area with the water trail. The website provides an interactive map for paddlers, river and weather conditions, information about river towns, and safety and etiquette recommendations. There is additional information about a wide variety of adventures available to river users, including kayaking, canoeing, fly-fishing, tubing, and other freshwater pursuits.

## Enforcement Best Practices

Enforcement ensures that those recreating on and alongside the river are held accountable for their recreation activities. Enforcement helps manage trespassing and disturbances to property, prevent the dumping of litter and trash, and monitor other law enforcement challenges. Additionally, enforcement limits capacity and restricts illegal, inadvisable, or unsafe behaviors at recreational sites.

Although passive means of regulation, including signage and other educational information, can help control use and experiences voluntarily, it may be necessary to engage law enforcement to monitor or assist recreational users. Search-and-rescue efforts and medical assistance are (ideally) rarely required, but there will be instances where such services are needed. Enforcement also plays an important role in monitoring the impacts of recreation to sensitive landscapes and wildlife habitat and addressing problems associated with unsafe, illicit, or illegal activity; trespass; or impacts to private lands surrounding recreational areas.

Partnerships and coordination between law enforcement personnel, federal and state park rangers, and emergency management representatives (fire, medical, and health and safety personnel) is critical. Effective collaboration and coordination between law enforcement and emergency personnel at multiple levels can establish a common understanding of recreational goals and appropriate activities, improve communication, identify problematic issues (such as trash dumping or intrusion on private property), and catalyze collective actions to handle agreed-upon issues.

Engaging emergency management planning early in the recreation planning process will help identify which entities carry responsibility for public health and safety. When dealing with rescue situations, enforcement of laws, and potential illegal activities, different agencies and law enforcement

officials may have jurisdiction over different reaches of river or recreational areas in a region. Collaborative efforts on the front end of planning will encourage different entities to work together in a consistent manner, keeping each other informed about incidents, response, and challenges across the management area.

Emergency management plans can and should be integrated into river recreation management and enforcement. Communities have a number of different tools to rely upon for developing emergency response plans, including the U.S. National Grid system and the Trail Emergency Access System (TEAS). The TEAS is a series of numbered signs associated with a specific GPS point installed along a particular trail. If a user is in need of assistance, they call 911 and give the associated TEAS number they are closest to, and help will be sent their way. Because these systems are coordinated at the regional scale along the river, they can be effective in providing quick aid to someone in need.

Another aspect of enforcement activities to sustainably manage recreation resources is the establishment of permit systems to control visitation, especially at popular sites. Permits help ensure a quality experience for river users and protect environmental values, control access and overcrowding, and manage recreational use as it relates to specific activities, such as rafting or boating. Popular recreational sites, particularly on-river recreation in certain high-demand river stretches (such as the Colorado River through the Grand Canyon, or the Middle Fork of the Salmon River in Idaho), utilize a lottery system in order to provide a fair and equitable means of distributing a limited number of permits to the large number of people requesting them. For other areas, reservations and permits are implemented for campsites or day-use areas as well, such as the reservation system that is used to regulate visitors at Fossil Creek in Arizona or the Blackfoot River in Montana.

### Trail Watch in Minneapolis, MN

In communities across the country, volunteers are coming together to regulate safety and enforce rules to better steward shared public resources. In Minneapolis, along the Midtown Greenway, concerned citizens started Trail Watch, a bike-mounted safety patrol. Trail Watchers serve as an extra set eyes and ears for law enforcement by observing and reporting suspicious behavior or unsafe conditions. They do not intervene in incidents but rather report suspicious or criminal activities to local law enforcement agencies for proper investigation.

## Managing Clear Creek, Golden, CO

The city of Golden, Colorado, when creating the Clear Creek Management Plan, established a new “Clear Creek Park Ranger” position within the Golden Police Department (GPD) to assist members of the local police force with issuing administrative citations for prohibited activities. Since the management plan enforcement activities were instituted, which included the hiring of park rangers and the installation of signs describing park rules, there have been fewer violations. In 2013 GPD issued almost 400 violations, and in 2014 they issued only 12.<sup>19</sup>

## Monitoring Best Practices

Monitoring efforts measure how sustainable recreation management plans are being implemented and whether goals are achieved. Monitoring involves observing or measuring selected features to assess whether management actions, decisions and practices are having the desired impact on ecosystem health. It allows recreation managers to gauge how the ecosystem is supporting human use, and tracks whether management and conservation goals are being achieved. Monitoring is essential to the protection and stewardship of natural resources, and when incorporating citizen science and volunteer efforts, is also a way for people to learn about natural resource processes and wildlife.

Monitoring is a critical part of the management prescription evaluation process. When evaluating the data for management plans, recreation managers should compare the individual monitoring results against the identified benchmarks and outcomes for goals and metrics of each management practice.

Developing indicators or specific metrics related to a management goal is a critical step in ongoing monitoring efforts and evaluation.

Important Indicators to Consider Include:

- Linking the goals of sustainable recreation, such as environmental protection, appropriate access and capacity levels, and identification of issues related to recreational use.
- Indicators should be data-driven for decision making and ongoing management, character of the areas to be monitored, and logistical and capacity constraints.
- Once established, a monitoring plan can be developed which compiles individual research methods together, to determine if management actions to protect the river and surrounding

lands are successful and carrying capacity standards are met. Once indicators and metrics have been identified, the monitoring plan can be developed. Monitoring plans are different for every reach of river.

Consider the Following Steps:

- Identify the area of emphasis (i.e. river access point)
- Identify management goals for the area. For example, one goal may be to improve recreation access and stabilize a stream corridor with native plants, clean water, and adequate flows for river recreation.
- Develop a team of monitors to carry out plans and collect data. Partnerships with nonprofit organizations and coordination of volunteers can provide critical assistance to sustainable recreation management efforts.
- Determine indicators and data collection methods to measure whether goals are being met. Examples include:
  - o Prevalence of native plants and species vs. non-native species along the river and recreation trail
  - o Water quality minimum standards for recreation and human contact.
  - o Visitation levels as well as social encounter levels, as measured by visitor surveys or on-site data collection
  - o Monitoring of conditions in high-use areas to evaluate impact of recreational use on natural resource values
- Analyze data gathered by monitoring teams to evaluate the success and challenges resulting from management strategies.
- Develop a process for refining the plan if new information or unexpected results are discovered. “Adaptive management” is an essential tactic in managing sustainable river recreation. Consider new information as well as changes in thresholds and user needs to keep monitoring and best management practices up to date, relevant, and in compliance with capacity limitations.

Monitoring along with the three E's including engineering, education, and enforcement are not intended to function on their own in sustainably managing recreation activity, but to provide a comprehensive framework that touches on all elements in creating a successful design, implementation, and accountability strategy.

Working together, they provide communities with tools to sustainably manage recreation while simultaneously protecting critical resources, providing a positive user experience, and educating community members about the importance of their river and management practices.

Example of Monitoring Strategies: This can be used as a template to help create a monitoring strategy, including broad goals and objectives, questions to consider and the results of monitoring.

Area of Emphasis: Recreation		
Monitoring Goal: Opportunities for river access are available, diverse and maintained for all types of recreation in and along the river and maximize user experience.		
OBJECTIVE	QUESTIONS TO CONSIDER	MONITORING RESULTS TO NOTE
Rivers are accessible from multiple points across the river trail.	Did you survey the river for suitable access points, as planned? Did you encounter or anticipate challenges?	How many access points are in place and being used? <i>XX are in place</i>
Access points allow for different types of recreation to occur	Did you survey the river for different types of recreation as planned? Did you encounter or anticipate challenges?	How many different types of recreation are occurring at each access point? <i>XX Types of uses occur and include YY</i>

Area of Emphasis: Recreation		
Monitoring Goal: Recreation access is improved by a strong conservation ethic with native plants, clean water and adequate flows for river recreation.		
OBJECTIVE	QUESTIONS TO CONSIDER	MONITORING RESULTS TO NOTE
Native plants and species are prevalent along the river.	Did you survey the river for native and invasive species as planned? Did you encounter or anticipate challenges?	What are the numbers of native species and what is the percentage of cover? <i>XX native species in place and include YY</i>
Water quality exceeds minimum standards for recreation and human contact.	Did you determine the minimum water quality standard for your river and develop a volunteer monitoring program? Did they monitor different reaches of the river as planned? Did you encounter or anticipate any challenges?	Did the water quality meet or exceed the water standards for the reach of river <i>The water quality met/did not meet the standards described</i>

## Monitoring the Northern Forest Canoe Trail

The Northern Forest Canoe Trail (NFCT) extends for 740 miles across contiguous rivers, streams, and lakes from Old Forge, New York, through Vermont, Quebec, and New Hampshire to Fort Kent, Maine. To manage a trail of this size, the NFCT Stewardship Committee created a cohesive management plan that maintains the entire length of the trail. The Stewardship Committee works with private landowners and land managers to create management agreements, which allows their land or recreational amenity (access, portage, or campsite) to be considered part of the NFCT corridor. For each parcel, a time frame is identified and a unique management plan created, which takes into account the landowners' individual wishes. When the agreement expires, it is reevaluated and if necessary changes are made. The Stewardship Committee also created Trail Maintainers, a group of volunteers who maintain sections of the water trail. Trail Maintainers visit segments once per season, depending on conditions. Tools are also stored along the trail.

## Funding Sustainable Recreation Management

It can be a significant challenge to secure the funding necessary to adopt and implement management strategies identified in this report. It is difficult to finance ongoing efforts for visitor education, management and monitoring, and enforcement over time; however, funds to develop new and update existing recreational sites, including new site design and construction costs, are often less challenging to secure. It is often easier to fund projects in which recreational efforts result in changes the community can see, which are often capital projects with physical additions to the landscape.

Challenges to fund ongoing management, enforcement, and monitoring arise because they are often invisible to both the user and the funder. Management is a sustained, long-term need that stretches beyond the time frame and interest of many funders willing to support recreational amenities. Securing funds to manage recreation requires creative thinking, consideration of long-term needs to support sustainable recreation, and development of partnerships and structures to sustain ongoing work.

Groups that are more likely to support sustainable recreation management include governmental and philanthropic organizations and nontraditional sources. Links to additional information on funding is available in the Appendix.

Funding from Governmental Sources Include:

- Municipal funding from local park and recreation departments, planning departments, open space programs, or other programs may support recreation management
- State funding sources from departments of wildlife, natural resources, or others that support the development and management of river recreation
- Funding and technical assistance to help plan and implement recreation management
- Usage fees, through entrance fees, permits, concessions, product sales, or special activities, to support recreation management

Funding from Philanthropic Sources Include:

- Corporate gifts through in-kind donations and cash support for recreation management
- Private foundations or individual donations for recreation management
- Kickstarter campaigns or other online crowdsourcing technology where supporters can contribute to a specific cause
- Lottery or raffle sponsorship with proceeds supporting recreation management

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# PART 3:

## Implementation of Best Practices in the Verde Valley

The Verde River is a small, though important, river with highly variable seasonal flows. When considering sustainable recreation management on such a river, it is important to take into account appropriate capacity for recreational use. The capacity for the Verde River is likely to be quite different from that of rivers such as the Missouri, Mississippi, or even other tributaries of the Colorado. Determining the right capacity is an important management task, assisting both short- and long-term planning for recreation opportunities while also protecting the resource and enhancing the user experience.<sup>20</sup>

Recreational potential in the Verde River and surrounding landscape has been widely recognized in recent years. A host of collaborative, regional initiatives are working to support, manage, and promote outdoor adventure

opportunities. Recognizing the challenges associated with a growing recreation economy, Verde Valley communities have taken steps to manage these challenges by creating riverfront master plans and bringing together diverse stakeholders to create a unified vision for the Verde Valley.

This report is intended to support existing efforts in the Verde Valley to manage sustainable recreation while protecting and restoring the river itself, its riparian habitats, and the other recreational and natural resources of the Verde Valley. The following section describes current recreational planning initiatives on the Verde River and illustrates how best practices described in this report can be integrated into ongoing recreation planning efforts.

### Verde Front Collaborative Initiative

The Verde Front is an ongoing regional collaborative initiative focused on sustainable recreational planning in the Verde Valley. The collaborative arose out of a landscape-scale visioning and planning process initiated in 2008 by the Prescott National Forest. This initiative is a part of the Central Arizona Sustainable Recreation Coalition. It has brought together public land management agencies, Yavapai County, local municipalities, conservation and recreation non-governmental organizations (NGOs), and other interested citizens to begin a dialogue with an “all hands, all lands” approach to regional recreation planning.

The Verde Front collaborative envisions that “citizens, organizations, agencies, and local governments collaborate to protect ecosystem health, natural and cultural resources, and promote robust economies in the cities and towns of the Verde Valley, with emphasis on well-managed recreation, education, and restoration that sustainably connects people to the land.” Already, the Verde Front has established several working groups to focus on their vision, particularly in areas of recreational planning – Trails, River Recreation (formerly known as the “String of Pearls” working group), Youth Pathways, Cultural Resources, Economic Development/Geotourism, and Watchable Wildlife. The River Recreation Working Group is one of the most active, with representation from the majority of Verde Front partners.

The Verde Front has been lauded as a successful model of regional cooperation on common goals around sustainable recreation. It has improved communication and dialogue significantly between Verde Valley communities, Yavapai County, public land managers, and nonprofit groups. It created a forum for sharing lessons learned, plans for future recreational development, and joint planning for educational and interpretive signage that can be used consistently throughout the region. The Verde Front is well-positioned to carry forward the management recommendations outlined in this report, and members of the Verde River Recreation Working Group have been consulted in its development.

## Existing Collaborative Efforts to Improve Recreational Opportunities and Management Needs

Verde Valley communities, federal and state agencies, and local groups have been grappling with the challenges of increased recreation demand coupled with increasing tourism visitation to the region. A number of collaborative, community-based initiatives were developed to promote regional cooperation. These address recreation management challenges, how to sustainably accommodate tourism, and ways to support economic development.

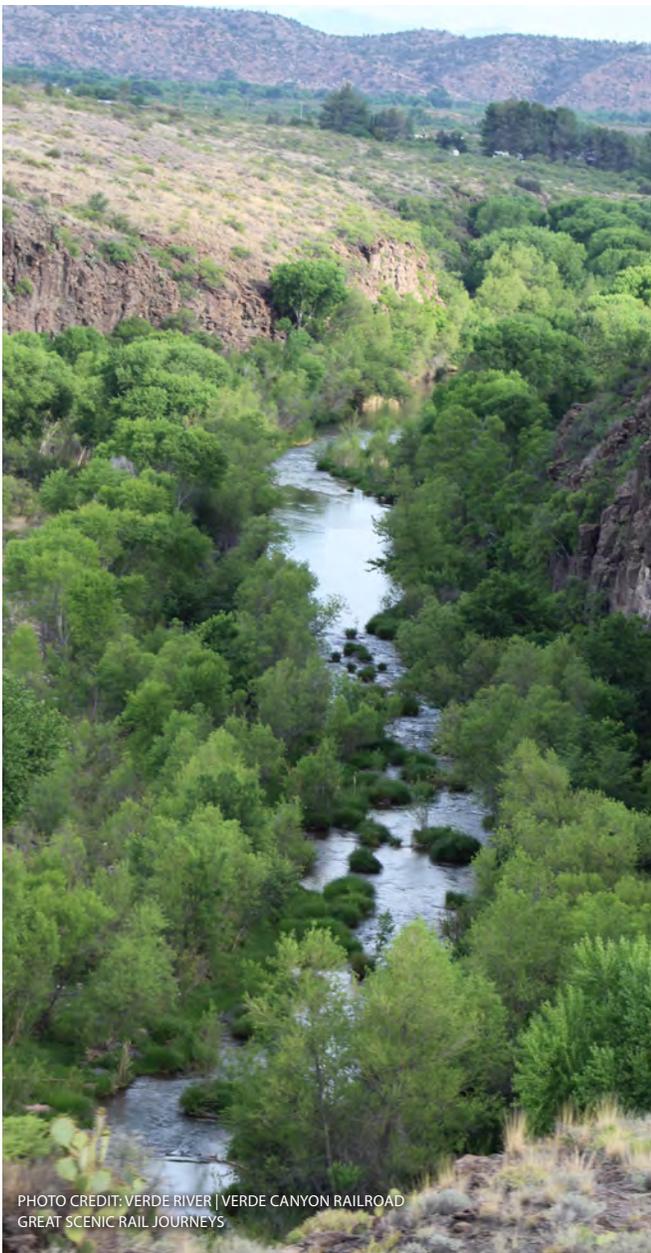


PHOTO CREDIT: VERDE RIVER | VERDE CANYON RAILROAD  
GREAT SCENIC RAIL JOURNEYS

### National Geographic Geotourism Initiative

Conceived with the intention of supporting local business while protecting and preserving the unique natural values of the Verde Valley (particularly the Verde River,) the Verde Front began exploring geotourism. In 2014, to further this work, The National Geographic Society and travel consulting organization Solimar International were invited to the Verde Valley to work with the local communities, chambers of commerce, business interests, and conservation groups to develop a geotourism-based marketing effort promoting outdoor adventure opportunities and tourism amenities in the Verde Valley. In February 2015, National Geographic and Solimar kicked off a community process, branding the Sedona Verde Valley as one of only about 20 geotourism destinations globally recognized by National Geographic.

The program highlights the important role tourism plays in the economies of the Verde Valley, and it established a framework for how to build a locally driven tourism economy to sustain economic prosperity, livelihoods, and the natural and cultural resources of the region. To date, the geotourism initiative has built a region wide identity supported by local businesses and chambers of commerce, local governments, and conservation interests. After the development of a website and marketing strategy led by National Geographic and Solimar International, the program was turned over to the Sedona Verde Valley Tourism Council, a local stakeholder group involved in the geotourism effort.

Marketing the tourism potential of underutilized areas of the Verde Valley is an important part of addressing overuse in some areas of the Verde Valley. Overuse could lead to unsustainable impacts in other areas of the region, especially in sensitive riparian habitats and in areas where conflicts between recreational uses and residential property owners could increase. There is great interest in anticipating and managing capacity issues before surrounding areas become impacted and the resource values in those areas decline.



PHOTO CREDIT: PADDLING THE VERDE RIVER | SUSAN CULP

## Verde Valley Recreational Priorities

Many towns participating in the Verde Front initiative have developed community-led recreation master plans that prioritize economic development and recreational use while maintaining the high quality of life residents enjoy. Through these initiatives, communities have developed focus areas for recreational planning. They have also designed management approaches for sustainable river recreation, ensuring protection of the river and surrounding lands. Recreation master plans can enhance recreation and the local connection to the river, but are often unique to each community.

Across the United States, communities like those in the Verde Valley have successfully created their own locally driven plans to promote recreation while protecting rivers and landscapes. In 2016, American Rivers released *A Guide to Sustainable River Recreation Management Planning*, which outlines a framework for local governments, planners, nonprofit organizations, and others to develop an effective river recreation management plan with strong community support. It provides resources and shares case studies that shine a spotlight on communities that have navigated the recreation management planning process and developed

and implemented successful river recreation management plans. The link to this report, and other information about best practices for crafting recreation master plans, including specific plans and examples, can be found in the Appendix.

Communities in the Verde Valley have identified plans and goals for improving river-based recreation. Below is a summary of the river recreation priorities for the towns of Clarkdale, Camp Verde, and Cottonwood based on their recreation master plans. Many of the endeavors laid out in these plans are in the early stages of completion, representing opportunities to incorporate best practices described in this report. These efforts are laying the groundwork for additional work to be done in the region with the support of the Verde Front collaborative initiative. Although each of the communities' plans emphasizes different features of recreational use – boating and kayaking in Clarkdale, watchable wildlife in Camp Verde, and riverfront trails in Cottonwood – each community has committed to preserving the ecological integrity of the Verde River and addressing the challenges of managing river recreation while improving local economies and opportunities for geotourism.

## Clarkdale, Arizona

The town of Clarkdale completed its master plan for the Verde River @ Clarkdale in June 2012. The vision articulated within the Verde River @ Clarkdale master plan is “community access to a healthy, flowing Verde River . . . complete with a multitude of diverse outdoor experiences.” Clarkdale’s goals for implementation include protection, preservation, and restoration of the river and its habitats; honoring existing water rights; enhancing public understanding of the importance of the Verde River and surrounding habitat; enhancing the community quality of life; and improving the economy of Clarkdale. One of the most significant goals is to improve access to the Verde River for recreational use. Through the master planning process and working with Arizona State Parks, the town developed an intergovernmental agreement for joint management of the Tuzigoot RAP and site access improvements for the mobility-challenged.

The town of Clarkdale, working with mining company Freeport-McMoRan, developed an upstream river access point near TAPCO (a decommissioned power plant near the river), to provide access for boaters, kayakers, and other recreational users to the Verde River. Clarkdale has also implemented an innovative approach to ongoing management at the river access points, incorporating volunteers into the Verde River Ambassador program. Ambassadors at the Tuzigoot and Lower TAPCO RAPs provide education, monitoring, and limited enforcement to ensure sound stewardship of the natural values of the sites and safe outdoor recreation experiences. There is interest in further improving the management of these areas through monitoring practices.

## Cottonwood, Arizona

The city of Cottonwood released its Riverfront Trails and Recreation Master Plan in 2016, serving as a development blueprint for a high-quality, interconnected, multimodal, regional trail system. This plan was prepared through a collaborative effort involving local citizens, stakeholder input, advisory groups, the city, and representatives of federal and state land management agencies. The project capitalizes on the Verde River and identifies future trails throughout Cottonwood and other regional destinations. This nonmotorized trail system is designed to serve a diverse range of users and provide safe and well-maintained links to important natural, cultural, and civic destinations, as well as other points of interest both within and outside the city.

The Cottonwood Master Plan provides focus for the city and local trails groups, and it identifies future action items to help ensure progress and implementation of the trails plan. Additionally, it identifies various funding resources, serving as a foundation for future grant applications. It also includes technical information to serve as a reference guide for city agencies, local communities, trail groups, and stakeholder groups regarding the planning, design, and construction of Cottonwood’s trail network.

## Camp Verde, Arizona

Efforts to develop Camp Verde’s River Recreation Master Plan began in the spring of 2015. The project team, working with local stakeholders, provided support in developing community stakeholder engagement efforts to identify priorities and support for the plan’s elements. Camp Verde’s vision and goals included connecting residents and visitors with the Verde River and increasing awareness and appreciation for the river and riparian corridor. The plan also responds to concerns of riverfront property owners about recreational use; provides safe, healthy, family-friendly recreational experiences along the river corridor; manages sustainable recreational use to protect community values; and supports economic development through tourism amenities.

The River Recreation Master Plan, which was completed in early 2016, identifies four significant river recreation-related improvements for immediate implementation and several projects that include not only the town of Camp Verde, but also other communities, Arizona State Parks, and the USFS. Improvements include development of public access and recreation opportunities at town-owned sites such as Parsons Park and Rezzonico Park, as well as partnerships with agencies to improve access and facilities. Priority multijurisdictional projects include development of educational and interpretive signage for use throughout the public sites and identifying private property where recreational activities are not allowed. Additionally, Camp Verde prioritized an application for an Audubon-recognized Important Bird Area (IBA) along the Verde River corridor running through the town. This designation would support watchable wildlife activities and low-impact, environmentally sustainable development at areas with sensitive habitats.

## Recommendations for the Verde Valley

The best practices described in this report are intended to provide assistance to Verde Valley communities, public land agencies, nonprofit organizations, and interested citizens for sustainably managing recreation while protecting the incredible natural values of the Verde River corridor.

Identification of specific on-the-ground efforts or initiatives in which the best management practices in this report may be utilized is best accomplished by collaborating with the Verde Front, where multiple stakeholders are working together on a regional vision for sustainable recreation management. The River Recreation Working Group of the Verde Front has spent significant time identifying existing recreational sites along the Verde River as “pearls” in the Verde String of Pearls, and identifying future “pearls” for future development of river-related activities.

Community river recreation master planners are also making great strides in identifying recreation development opportunities and planning challenges in the Verde Valley. Additionally, while each distinct community along the middle stretch of the Verde River has completed, and is in the process of implementing, a community river recreation master plan, there is interest in developing a more comprehensive assessment of the Verde River’s recreation capacity and crafting a regional comprehensive river recreation plan.

The information included in this report and the recommendations below could be built into existing recreation planning occurring in the Verde Valley. Many of these suggestions fit within the priorities of the communities and the Verde Front River Recreation Working Group.



PHOTO CREDIT: CAMPING SPOT ABOVE CHILDS RAP | SUSAN CULP

## Recommendation #1 – Conduct a Comprehensive Recreation Capacity Analysis

As defined earlier, recreation capacity is the maximum amount of recreation use and resulting impacts that can be accommodated in a park or outdoor recreation area without resulting in unacceptable change to natural and cultural resources and the quality of the visitor experience. Although recreation capacity has been examined and thresholds identified for a handful of stretches along the Middle Verde River, a full analysis along the entire stretch from Sycamore Canyon to the Wild & Scenic reach, including major tributaries, has not been completed. Such an analysis remains an unmet need in the Verde Valley.

Conducting a thorough analysis of this scale is a complex and daunting task. Retaining a professional firm with experience and expertise in recreation capacity analysis is well worth the expense. However, there is much that an organization like the Verde Front can do to prepare for such an effort. Below is an outline to guide such preparations and inform a recreation capacity assessment process. This material is drawn heavily, though paraphrased and simplified, from the Interagency Visitor Use Management Council's 2016 Visitor Use Management Framework report.<sup>21</sup> A link to this report can be found in the Appendix.

1. Develop baseline information summarizing current conditions of the natural, cultural, and recreational resources of the Verde River:

- Clearly define the geography of the assessment area
- Identify threats to sensitive or key natural and cultural resources within that area
- Gather recreational use trend data
- Identify existing administrative management operations of recreational resources (and gaps or cross-jurisdictional collaborative needs)

Baseline information can be gathered from existing monitoring information or can be new data compiled during the process to identify river capacity. Data to consider include current use trends and existing amenities such as trails and access points and the various types of plants and wildlife, among other things.

2. Clearly define the desired recreational uses and natural/cultural resource conditions for the assessment area

- Consider establishing “zones” along the Verde River where different types and intensities of recreational activities may be appropriate given natural and cultural values.
- Make use of the ROS spectrum to identify the desired type of recreational experiences that various “zones” or boatable stretches along the Middle Verde River will provide to recreational users.
- Define appropriate facilities and services to support the recreational uses or activities identified for the different “zones” along the Verde River.
- Establish indicators and standards (thresholds) that will guide future monitoring and evaluation of recreation capacity to inform ongoing management of the area. Indicators should be directly relevant to maintaining the desired recreational and natural/cultural resource conditions of the area, and should focus on the minimum number of the most critical indicators to ensure ease and effectiveness of ongoing monitoring.

3. Identify appropriate recreational use capacities based on current and desired conditions in the assessment area:

- Compile baseline information and develop a clear understanding of current uses and constraints or challenges through monitoring throughout the watershed.
- Identify limiting attributes associated with the ecological, social, and managerial systems within the assessment area.
- From this data, determine recreation capacity at an appropriate level. Monitoring should continue and will inform new capacity and adaptive monitoring strategies.
- In communicating the recreation capacity level to the public, ensure the management agencies or entities have a logical and reasonable rationale to explain the recreation capacity level.

Once an appropriate recreation capacity level is identified for a particular “zone” within the assessment area, management strategies and actions can be identified to guide recreational use within those capacity levels. A sampling of the types of management strategies and actions that may follow the setting of recreation capacity levels for a given area are below.

These also draw from the Interagency Visitor Use Management Council's 2016 report:

4. Identify management prescriptions or actions to achieve the desired conditions and capacity for recreational use and protection of natural/cultural resource values.
  - Identify management strategies that will best align current and desired conditions. These strategies <sup>22</sup> may include:
    - o Modification of type of use
    - o Modification of recreational user behavior
    - o Modification of recreational use attitudes and expectations
    - o Modification of the timing of use
    - o Increase in the ability of sites to handle recreational use
    - o Modification of the distribution of use within the region
    - o Reduction of recreational use or increase in the supply of sites that provide recreation
  - Identify specific management actions to manage recreational use, which may make use of the "Three E's" framework: Engineering, Education, and Enforcement.

When undertaking a recreational capacity study in a watershed like the Verde, where there are many landowners, including federal, state, and local governments, it is important to have a clear understanding of priorities for each of the land managers. Identifying the types of recreational use and desired conditions for their reach of river and surrounding land will help to determine a carrying capacity. Once individual reaches have identified their priorities, land managers should work together to determine mutual goals and thresholds for the entire reach of the river. Within the Verde watershed, this prioritization process could take place in the River Recreation Working Group with the help of an outside consultant to facilitate the conversation and identify mutual expectations and desires.

The Verde Front should consider contracting with a recreation management expert to help assess and identify the recreational capacity for the different reaches of the river. This contractor would help gather data and bring expertise and suggestions as they relate to management strategies and determining desired conditions. Additionally, a recreation management expert can often provide further knowledge and expertise relating to the implementation of management strategies that cross management jurisdictions and other desired conditions based on the type and amount of use.

Once information about the different reaches has been collected, it is helpful to create a table that summarizes the data. This table will provide an overview to refer to during the monitoring and assessment process for each river segment. The information it contains can help demonstrate how desired use changes for the different reaches of the river will intersect. It can be used to identify holistic management strategies for the entire reach of the river and strategies more tailored to desired conditions of secondary reaches.

Information in the summary table should include:

- Management goals, objectives, and desired condition for the reach
- Major concerns related to recreation use and potential impacts
- Indicators and thresholds such as encounter rate, effect on wildlife, or challenges surrounding habitat changes, such as social trails or riparian erosion
- Range of potential management strategies, including suggestions from the Three E's
- Important limiting factors, such as overcrowding or protected species
- Current strategies in place to limit challenges
- Evaluation of the existing user experience
- Alternatives for the recreational capacity and amount of use, including both the current use rate and suggestions such as lowering or increasing the number of users

Either the recreation management consultant or the facilitator should help to present this information to both the Verde Front and the general public. Not only will they help better describe why management strategies have been implemented, but they will also provide a plan and strategy for the rollout of the new plan. The Verde Front's interest in exploring the recreational capacity limits for the stretch of the Verde River flowing through the region is admirable.

Prescott National Forest is undertaking a recreational capacity analysis for the Prescott National Forest as a whole. Staff is focused on different areas of the Forest, including the Verde River from Perkinsville to Gap Creek. This recreation capacity assessment could provide management with the necessary guidance for the river, but if not, additional evaluations may be needed. The Verde Front Leadership Council is encouraged to work closely with the Prescott National Forest on their capacity analysis to coordinate for greatest impact.



PHOTO CREDIT: SCOUTING VERDE FALLS | SUSAN CULP

## Recommendation #2 – Focus Recreation Site Design on Watchable Wildlife

The economic potential of watchable wildlife activities has been acknowledged by all Verde Valley communities, and the riparian corridor along the Verde River is host to significant wildlife resources, including a diversity of resident and migratory birds, deer, elk, javelina, coyote, bobcats, and other wildlife. Camp Verde's Verde River Recreation Master Plan identified improving watchable wildlife as a high priority for residents and economic development staff. Homestead Park was identified as most suitable for protection of wildlife habitat along the Verde River riparian corridor and for light development to support watchable wildlife opportunities. As such, this area may be suitable for semi-primitive development under the Recreation Opportunity Spectrum (ROS) guidelines when considering site design and development. Camp Verde, Prescott National Forest, and Arizona State Parks are currently working together to plan the design and development of recreational amenities at Homestead Park.

Motorized access to the trailhead and parking area is appropriate and will be accommodated. It is unlikely that the park itself would be able to support motorized recreation or intensive development while protecting the wildlife values of the site. Hiking and equestrian trails throughout the park itself will provide for appropriate nonmotorized access. In preventing motorized access to the park, the town has collaborated with the public land agencies to install gates and place boulders near other access points to restrict unauthorized motorized vehicle intrusion. Further low-impact design should continue as the development moves forward.

To minimize disruption to natural areas and follow current, commonly used routes, planners should build upon existing social trails and vehicle tracks. Expansion of trails should be limited to accessing areas where wildlife viewing

opportunities could be maximized, such as near foraging areas, while protecting sensitive areas such as nesting sites in riverside vegetation or mesquite bosques. Viewing decks in areas that overlook the open spaces and are unlikely to experience seasonal flooding would provide gathering places to observe wildlife with a minimum of disruption to natural behaviors. Additionally, educational and interpretive signage as it pertains to wildlife values should be incorporated at various points along the trails. This will increase awareness of species common to the area, caution against off-trail exploration that could harm vegetation and disturb wildlife, and encourage good stewardship by users.

A process similar to what is done to identify recreational capacity could be done to identify strategies and alternatives for design. This is a smaller-scale analysis and will likely not require outside support or expertise. Additional suggestions for engineering site design can be found in the Appendix.

Recreational capacity planning should:

- Spell out the goals, objectives, and desired user experience
- Define major concerns related to recreation use and potential impacts to wildlife
- List potential indicators and thresholds, such as effect on wildlife or challenges surrounding habitat changes, such as social trails or riparian erosion
- Identify the range of potential management strategies, including suggestions from the Three E's, particularly around site design
- Describe the most important limiting factor, such as protected species
- Outline alternatives for the recreational capacity and amount of use, including both the current use rate and suggestions for lowering or increasing the number of users

### Recommendation #3 – Establish a Coordinated Permitting System

The coordination of permits and fees is a challenge for those planning both commercial and private trips. Currently, different reaches of the Verde and individual river access points have separate commercial permits and day use fees. Coordinating initiatives across the Middle Verde River for both of these efforts could help to reduce confusion around regulations and permits.

One of the ongoing challenges around permitting is the regulation and management of commercial recreation outfitters, guides, and service providers on the Verde River. Clarkdale, in coordination with Arizona State Parks, has developed clear permitting requirements and expectations of commercial outfitters. Likewise, the USFS has its own set of regulations for commercial use of federal lands, including river access points found on Forest Service lands. Other communities have not yet established guidelines and rules for commercial recreational use.

Commercial outfitters in the area have expressed some concern about development of a patchwork system of different rules, permitting systems, and regulations for different stretches of the Verde River. Such a patchwork would make compliance complicated and burdensome for those who operate along the full length of the Verde River.

There are a few river access points that require a day use fee. Managers of these areas often get questions from river users regarding whether they are able to use the Red Rock Pass or State Parks Pass to cover the entrance costs to river access points. Creating a comprehensive pass for the entire reach of the Middle Verde River could help improve the regulation of day users while also generating revenue used to manage and

maintain sites along the Verde River.

There are a number of benefits associated with the day use fees, such as reducing confusion among users of river access points, but there are challenges associated with them as well. Today, very few river access points have day use fees associated with their use. There is likely to be pushback from the general public if a day use fee is implemented without proper outreach and input from the general public. The Verde Front River Recreation Working Group is encouraged to create a separate task force to investigate this opportunity and solicit input from the general public before pursuing this option.

The Verde Front may be a useful forum for discussing both the consistent and streamlined system of managing commercial recreation activity and day use permits and fee structure. A coordinated effort may reduce the logistical difficulties of navigating a complicated system of permitting with different rules along different stretches of the river.

The working group should consider establishing intergovernmental agreements between riverfront communities and public land management agencies to craft a streamlined, cooperative, and consistent permitting service for commercial outfitters to regulate capacity along the entire length of the Middle Verde River.

The creation of a common permitting system and day use fee structure along the Verde River could also create a shared revenue stream, allocated by commercial trips scheduled along certain stretches or making use of specific access points. This system could potentially fund river access management and maintenance over the long term.

#### Managing Commercial Permits in Western Colorado

In Colorado, managing permits have taken a variety of forms. Each permitting system is different and provides flexibility needed to ensure the rivers and surrounding lands are managed according to their needs. Regardless of who manages the permitting process, everyone is required to meet the rules and regulations set by the various managing entities to protect the river and river users. The Bureau of Land Management (BLM) has established a Memorandum of Understanding (MOU) with both Pitkin County Open Space and Eagle County Open Space to not only manage commercial permits along reaches of the Roaring Fork River and the upper Colorado River, but also to manage and maintain the river access points. This MOU allows the BLM to partner with other land managers to provide public access and recreation along both the upper Colorado and Roaring Fork Rivers, including co-managing land that is owned by the Open Space. The MOU has streamlined permitting for rivers and their commercial users.

## Recommendation #4 – Establish an Ongoing Monitoring Plan

Monitoring for recreational use informs local communities, public land agencies, and others about demand for recreation, and appropriate levels of use compatible with recreation management goals. Incorporating monitoring is a cornerstone of successful implementation for recreation plans that balance the need for protecting resources, providing opportunities for community connection to the river, and sustaining economically vital sources of tourism revenues. Additionally, monitoring data will provide the baseline information for further recreational capacity analysis.

Moving forward, as new recreation planning projects and priorities are implemented in the Verde Valley, local communities should gather and incorporate data about recreational use and ongoing adaptive management. These monitoring strategies should be employed to ensure that activities do not degrade the Verde River and surrounding lands.

To help better manage monitoring across the Verde Valley and throughout the different jurisdictions, the Verde Front should create a monitoring working group tasked with ensuring that the monitoring and evaluation plan is implemented.

Participants should include local nonprofits, land management agencies, and parks and recreation departments to help with monitoring work. This group should coordinate to make sure monitoring results are compiled and monitoring strategies are implemented. If the Verde Valley communities do not have the capacity to do the monitoring themselves, it may be helpful to bring in additional partners to help or to contract with a consultant to help create the monitoring plan.

Communities in the Verde Valley should:

- Define the type of information to be collected
- Choose indicators that demonstrate the success or challenges associated with each action
- Identify methods and sites for monitoring
- Determine the time of year, day, and frequency of monitoring, and ensure data integrity

The above list of best practices for the Verde Valley is not exhaustive, but it does provide a starting place for the Verde Valley to better manage and sustain recreation along the Verde River today and into the future.



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# Conclusion

Managing outdoor recreation-related activities connected to both tourism and local use can be difficult. Balancing the need for resource protection is not easy, particularly for the Verde River and its riparian corridor, which are vital to maintaining thriving and healthy wildlife populations and represent one of the last healthy, flowing river systems left in the state of Arizona. Ensuring the right level and mix of recreation to meet demand for adventure and enjoyment is challenging. Successfully striking the balance will yield significant dividends in terms of quality of life for local communities; ensuring a healthy, flowing river long into the future; and attracting businesses that value those resources while supporting the tourism economy across the region.

American Rivers recognizes that recreation planning is vital to setting priorities and parameters for recreational amenity development in the Verde Valley and beyond. Site design principles, signage development, and capacity assessment and management are all topics worthy of several volumes of reports in and of themselves, and it is impossible to do them justice in a brief overview. More in-depth information about the various aspects of sustainable recreation planning can be found in the Appendix which contains information developed by American Rivers to inform and guide recreational planning processes. For communities that have not yet engaged in a comprehensive recreation management planning effort, these more detailed recommendations may be useful.

It is our intent that this report includes the basic principles for approaching recreation management and identifying capacity limitations to protect resource values and local quality of life. This report should serve as a starting point for Verde Valley communities to consider ways to embed sustainable recreation management strategies into their recreation planning efforts and economic development models for outdoor industries. Recommendations in this report should be applied as appropriate to specific locations, and in conjunction with a comprehensive site design, management, and monitoring plan for each area.



PHOTO CREDIT: PADDLING THE VERDE RIVER | DOUG VON GAUSIG

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# Appendix: Additional Resources

Planning, Capacity and Management		
TITLE	AUTHOR	WEBLINK
A Guide to Sustainable River Recreation Management Planning	American Rivers	<a href="http://www.bluetrailsguide.org/resources/a-guide-to-sustainable-river-recreation-management-planning/">http://www.bluetrailsguide.org/resources/a-guide-to-sustainable-river-recreation-management-planning/</a>
Water Trails Toolkit	Iowa Department of Natural Resources	<a href="http://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Water-Trail-Development">http://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Water-Trail-Development</a>
National Water Trails System Planning Toolkit	U.S. National Park Service	<a href="http://www.nps.gov/WaterTrails/Toolboxes/Planning">http://www.nps.gov/WaterTrails/Toolboxes/Planning</a>
Visitor Use Management Framework	Interagency Visitor Use Management Council	<a href="https://visitorusemanagement.nps.gov/Content/documents/highres_VUM%20Framework_Edition%201_IVUMC.pdf">https://visitorusemanagement.nps.gov/Content/documents/highres_VUM%20Framework_Edition%201_IVUMC.pdf</a>
Crowding and Carrying Capacity in Outdoor Recreation	Robert E. Manning, University of Vermont	<a href="https://www.uvm.edu/parkstudieslaboratory/publications/Crowding_and_Carrying_Capacity.pdf">https://www.uvm.edu/parkstudieslaboratory/publications/Crowding_and_Carrying_Capacity.pdf</a>
Truckee River Resources	One Truckee River	<a href="http://onetruckeeriver.org/library/">http://onetruckeeriver.org/library/</a>
Prepare to Launch!	River Management Society and U.S. National Park Service	<a href="http://www.river-management.org/prepare-to-launch-">http://www.river-management.org/prepare-to-launch-</a>
Blue Trails Guide Resources & Case Studies	American Rivers	<a href="http://www.bluetrailsguide.org/resources">http://www.bluetrailsguide.org/resources</a>
Carrying Capacity of Tourism System	Valentina Castellani and Serenella Sala.	<a href="http://www.trpa.org/wp-content/uploads/2005-Bosley-techniques-for-estimating-carrying-capacity.pdf">http://www.trpa.org/wp-content/uploads/2005-Bosley-techniques-for-estimating-carrying-capacity.pdf</a>
Techniques for Estimating Boating Carrying Capacity	Holly E. Bosley	<a href="https://www.usbr.gov/recreation/publications/recreationdemand.pdf">https://www.usbr.gov/recreation/publications/recreationdemand.pdf</a>
North Carolina State University	Doug Whittaker, Bo Shelby, Robert Manning, David Cole and Glenn Haas	<a href="https://www.fs.fed.us/cdt/carrying_capacity/Capacity_Monograph_May2010_FINAL.pdf">https://www.fs.fed.us/cdt/carrying_capacity/Capacity_Monograph_May2010_FINAL.pdf</a>
Department of Parks, Recreation & Tourism Management	<a href="http://www.trpa.org/wp-content/uploads/2005-Bosley-techniques-for-estimating-carrying-capacity.pdf">http://www.trpa.org/wp-content/uploads/2005-Bosley-techniques-for-estimating-carrying-capacity.pdf</a>	<a href="http://www.indiana.edu/~clp/documents/WATER%20COL%20V18,%20N2.pdf">http://www.indiana.edu/~clp/documents/WATER%20COL%20V18,%20N2.pdf</a>
Estimating Future Recreation Demand	Bureau of Reclamation	<a href="https://www.usbr.gov/recreation/publications/recreationdemand.pdf">https://www.usbr.gov/recreation/publications/recreationdemand.pdf</a>
Capacity Reconsidered: Finding Consensus and Clarifying Differences.	Doug Whittaker, Bo Shelby, Robert Manning, David Cole, and Glenn Haas	<a href="https://www.fs.fed.us/cdt/carrying_capacity/Capacity_Monograph_May2010_FINAL.pdf">https://www.fs.fed.us/cdt/carrying_capacity/Capacity_Monograph_May2010_FINAL.pdf</a>
Recreational Carrying Capacity in Lakes	Indiana Clean Lakes Program	<a href="http://www.indiana.edu/~clp/documents/WATER%20COL%20V18,%20N2.pdf">http://www.indiana.edu/~clp/documents/WATER%20COL%20V18,%20N2.pdf</a>
Trail Guidelines and Best Practices Manual	Massachusetts Department of Conservation and Recreation	<a href="http://www.mass.gov/eea/docs/dcr/stewardship/greenway/docs/dcrguidelines.pdf">http://www.mass.gov/eea/docs/dcr/stewardship/greenway/docs/dcrguidelines.pdf</a>
Determining a Capacity for Recreation and Monitoring Effects from Commercial Recreation Operations on Crown Land in BC	Doug Leavers Consulting	<a href="http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.589.2469&amp;rep=rep1&amp;type=pdf">http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.589.2469&amp;rep=rep1&amp;type=pdf</a>
Determining recreational visitor carrying capacity	Kenneth C. Forman	<a href="http://digitalscholarship.unlv.edu/cgi/viewcontent.cgi?article=1287&amp;context=thesisdissertations">http://digitalscholarship.unlv.edu/cgi/viewcontent.cgi?article=1287&amp;context=thesisdissertations</a>
ROS Primer and Field Guide	U.S. Department of Agriculture, Forest Service	<a href="https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5335339.pdf">https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5335339.pdf</a>
ROS Users Guide	U.S. Department of Agriculture, Forest Service	<a href="https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5277167.pdf">https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5277167.pdf</a>
Using Transportation to Manage Recreation Carrying Capacity	Nathan Reigner, Brett Kiser, Steve Lawson, and Robert Manning	<a href="https://pdfs.semanticscholar.org/b5e7/0d70fac085d19ac09aa7b06f472c65586d91.pdf">https://pdfs.semanticscholar.org/b5e7/0d70fac085d19ac09aa7b06f472c65586d91.pdf</a>
Recreation Facility Design Guidelines	Bureau of Reclamation	<a href="https://www.usbr.gov/recreation/publications/RecreationFacilities-DesignGuidelines.pdf">https://www.usbr.gov/recreation/publications/RecreationFacilities-DesignGuidelines.pdf</a>

River Recreation Management Plans		
TITLE	AUTHOR	WEBLINK
Recreation Management Plans for Montana	Montana Fish, Wildlife & Parks	<a href="http://fwp.mt.gov/recreation/management/">http://fwp.mt.gov/recreation/management/</a>
Yampa River Management Plan	City of Steamboat Springs, CO	<a href="http://steamboatsprings.net/DocumentCenter/Home/View/1595">http://steamboatsprings.net/DocumentCenter/Home/View/1595</a>
Beaverhead and Big Hole River Recreation Rules	Montana Fish, Wildlife & Parks	<a href="http://fwp.mt.gov/recreation/management/beaverheadBig-Hole/">http://fwp.mt.gov/recreation/management/beaverheadBig-Hole/</a>
Blackfoot River Recreation Management Plan	Montana Fish, Wildlife & Parks	<a href="http://fwp.mt.gov/recreation/management/blackfoot/">http://fwp.mt.gov/recreation/management/blackfoot/</a>
Durango Animas River Corridor Management Plan	City of Durango, CO	<a href="http://www.durangogov.org/DocumentCenter/View/1749">http://www.durangogov.org/DocumentCenter/View/1749</a>
Clear Creek Management Plan	City of Golden, CO	<a href="http://www.cityofgolden.net/media/ClearCreekManagement-Plan.pdf">http://www.cityofgolden.net/media/ClearCreekManagement-Plan.pdf</a>
Boise River Resource Management & Master Plan	City of Boise, ID	<a href="https://parks.cityofboise.org/media/994797/boise-river-resource-management-and-master-plan_final-12-29-14.pdf">https://parks.cityofboise.org/media/994797/boise-river-resource-management-and-master-plan_final-12-29-14.pdf</a>
Bronx River Greenway Plan	Bronx River Alliance	<a href="http://www.bronxriver.org/puma/images/usersubmitted/greenway_plan/">http://www.bronxriver.org/puma/images/usersubmitted/greenway_plan/</a>
Upper Nooksack River Recreation Plan	Upper Nooksack Recreation Advisory Committee	<a href="https://www.americanrivers.org/conservation-resource/upper-nooksack-river-recreation-plan/">https://www.americanrivers.org/conservation-resource/upper-nooksack-river-recreation-plan/</a>

Maps, Signage and Safety		
TITLE	AUTHOR	WEBLINK
Educating trail users: advice for planning interpretive trail signs	American Trails	<a href="http://www.americantrails.org/resources/wildlife/Interpretive-trail-signs-exhibits.html">http://www.americantrails.org/resources/wildlife/Interpretive-trail-signs-exhibits.html</a>
Interpretive Sign Guide	U.S. Fish and Wildlife Service	<a href="https://www.fws.gov/policy/signManual_LowRes.pdf">https://www.fws.gov/policy/signManual_LowRes.pdf</a>
Low Head Dam Signage & Outreach	Dam Safety	<a href="http://www.damsafety.org/media/Documents/PDF/LowHead-DamSignage_IndianaSilverJackets.pdf">http://www.damsafety.org/media/Documents/PDF/LowHead-DamSignage_IndianaSilverJackets.pdf</a>
Safety for Blue Trails	American Rivers	<a href="http://www.bluetrailsguide.org/build/safety/safety-for-blue-trails/">http://www.bluetrailsguide.org/build/safety/safety-for-blue-trails/</a>
National Water Trails System Mapping Toolbox	U.S. National Park Service	<a href="https://www.nps.gov/WaterTrails/Toolboxes/Mapping%20toolbox">https://www.nps.gov/WaterTrails/Toolboxes/Mapping%20toolbox</a>
U.S. National Grid Information Center	U.S. National Grid	<a href="http://usngcenter.org/">http://usngcenter.org/</a>
Trails Emergency Access System	Dallas County Conservation Board, Iowa	<a href="http://www.bikeiowa.com/uploads/articles/70_TEAS.doc">http://www.bikeiowa.com/uploads/articles/70_TEAS.doc</a>

Liability and Recreational Use Statutes		
TITLE	AUTHOR	WEBLINK
Public Access Guide for Landowners, Water Trails & River Managers	River Management Society	<a href="http://www.river-management.org/assets/WaterTrails/land-owner%20guidance_final_web.pdf">http://www.river-management.org/assets/WaterTrails/land-owner%20guidance_final_web.pdf</a>
Liability and Recreational Use Statutes	American Whitewater	<a href="http://www.americanwhitewater.org/archive/article/123">http://www.americanwhitewater.org/archive/article/123</a>

Funding Sources- Federal and State		
RESOURCE NAME	DESCRIPTION	WEBLINK
Funding Database	American Rivers	<a href="#">Information on state and federal funding and technical assistance programs and corporate funding</a>
Rivers, Trails, and Conservation Assistance Program	U.S. National Park Service	<a href="#">Technical assistance to help communities define project vision and goals, stakeholder engagement, creation of recreation management plans, and identify funding for implementation</a>
Land and Water Conservation Fund (State Side)	U.S. National Park Service	<a href="#">State Side of the LWCF provides matching grants to states and local governments for the acquisition and development of public outdoor recreation areas and facilities</a>
Arizona Heritage Fund	Arizona Game & Fish	<a href="#">Supports a variety of outdoor recreation and educational purposes – including public access improvements, environmental education, schoolyard habitat, and urban wildlife projects</a>
Arizona Water Protection Fund	Arizona Water Protection Fund	<a href="#">Supports grants to restore river, stream, and riparian resources; provides funds for continued maintenance; and supports increasing public awareness</a>
Arizona Grant Programs for Motorized, Non-Motorized and Diverse Projects	Arizona State Parks & Trails	<a href="#">Supports trail building and maintenance for motorized, non-motorized, and diverse trail projects</a>

Funding Sources - Charitable Source		
RESOURCE NAME	DESCRIPTION	WEBLINK
The Norcross Wildlife Foundation Caller Box 611 New York, NY 10024 Tel: 212-362-4831 Fax: 212-362-4783	Supports on-the-ground efforts focusing on education that strengthens connection to nature, as well as trails, nature centers, safety equipment, signage and access improvements	<a href="http://www.norcrosswildlife.org/">http://www.norcrosswildlife.org/</a>
The Fund for Wild Nature PO Box 900 Kelso, WA 98626 Phone: 360-636-6030 Email: fwn@fundwildnature.org	Supports organizations that protect wildlife, biodiversity and watchable wildlife efforts that educate the value of wildlife and improve connections for their habitats	<a href="http://www.fundwildnature.org/">http://www.fundwildnature.org/</a>
The Nina C. Pulliam Charitable Trust 2201 E Camelback Road, Suite 600B Phoenix, AZ 85016 Phone: 602.955.3000 Fax: 602.955.8029	Supports funding for environmental education and awareness, as well as promoting stewardship of natural resources and sustainably managing those resources	<a href="http://www.ninapulliamtrust.org/">http://www.ninapulliamtrust.org/</a>
The Dorrance Family Foundation 7600 E. Doubletree Ranch Rd., Ste. 300 Scottsdale, AZ United States 85258 Telephone: (480) 367-7000	Supports education and natural resource conservation that resolves societal, educational and environmental problems	<a href="http://www.dorrancefamilyfoundation.org">www.dorrancefamilyfoundation.org</a>
John F. Long Foundation 1118 E. Missouri Ave Suite A Phoenix, AZ 85014 Telephone: (602) 272-0421 ext. 505	Supports organizations that help local communities through self-empowerment, community organizing efforts focused on local neighborhood vitality and excellence	<a href="http://www.jflongproperties.com/foundation">www.jflongproperties.com/foundation</a>
Bess Spiva Timmons Foundation P.O. Box 8 Joplin, MO United States 64802-0008 Telephone: 417-625-3202	Supports grassroots organizations in a number of areas including ecology	<a href="http://www.timmonsfoundation.org">www.timmonsfoundation.org</a>

Funding Sources - Nontraditional	
FUNDING TYPE	DESCRIPTION
Repurposing funding from city departments	Existing funding for management and maintenance – examples include parks and recreation, transportation funds, open space programs, and others
Federal funding	Programs such as transportation and infrastructure, as well as funds from the Department of the Interior are available to help build and manage water trails
Public-Private Partnership	Working in tangent with private companies to help support management and maintenance of recreation areas with cash contributions and in-kind support in addition to the funds collected by the managing entity that is usually a government group or NGO
Capitol Campaign	Utilizing a mix of individual donors, commercial and corporate donors as well as foundations and federal and state grants to raise significant funds to complete a full project of phase of a project
Recreation Area Entrance fees	On-site cash transactions, can be left at a locked mailbox or with a river ranger/attendant
County or City Recreation pass	Credit card transactions in advance of visit for entrance and use of recreation areas
Concession fees paid for use of the resource for a financial gain	Fees paid by on-site vendors for food, beverage, lodging, and local product sales, or by tour guide companies to access the recreation area
Program revenues and special activity fees sponsored by managing entities	Revenue from programs that cost visitors money, such as tours, film showings, conferences, and meetings; and Fees paid for special activities for both private and commercial uses
Product sales by the managing entity	Sale proceeds from maps, books, stickers, art, and other materials to benefit management and maintenance
Membership income	Money collected from members of a related social organization
Personal philanthropy	Donations from individuals (primarily) that support the work of the group and the maintenance of the river
Grants	Money contributed from organizations, foundations, and other entities that are for specific projects and general support for management and maintenance
Environmental or mitigation payments	Fees paid as a result of some illegal activity related to wildlife, timber, fishery, trespass, resource damage, water and air quality violations, development violations, etc.; and Mitigation fees for development projects near recreation area
Land and water acquisition and sales	Proceeds from the purchase of land or water assets that are resold for financial benefit
Lottery, gaming, and raffles	Revenue gained from sponsoring gaming, auctions, raffles, and lottery programs



**American Rivers**  
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