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Water-Based Recreation





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On February 19, 1981, the Secretary of the Interior signed Secretarial Order No. 3060, which abolished the Heritage Conservation and Recreation Service and provides for transfer of its programs to the National Park Service by May 31, 1981.

Introduction

by Maureen Palmedo

Cooperation has become the key to effective management of water areas for recreation. This issue of *Trends* presents several examples of agencies working together to bring the public increased and better water recreation opportunities.

You'll see how the Water and Power Resources Service and the Tennessee Valley Authority lease some of their land to state and local agencies for public recreational purposes. Then, in a state perspective from Idaho, you'll learn about the challenges such cooperative agreements with federal agencies bring to the leasee.

By law, electric utilities now must develop recreational resources at their major hydroelectric plants. Two case studies here show how the Pacific Power and Light Company and the Pennsylvania Power and Light Company have been doing this and more for several years.

For the 1980s water recreation opportunities are growing along our nation's urban waterfronts. Ambitious revitalization projects are booming at urban waterfronts all over the country, attesting to the impact of federal clean water legislation and the desire of city dwellers to return to their waterways. Examples from Portland, Detroit, and various New Jersey cities indicate how recreation planners now work to improve the general quality of life for people rather than the quality of their recreation *per se*. These waterfront projects are bustling places that combine housing, commercial and office space, and recreational offerings.

In managing a water recreation area, both resource preservation and recreational use must be placed in proper balance. At Fire Island National Seashore managers attempt to maximize public support of their efforts through aggressive public relations and educational activities.

Safety and law enforcement in water areas, likewise, assume some unique aspects as shown in the article about Maryland's challenges on Chesapeake Bay. The challenges, however, are worth it to states like Delaware whose water-based recreational opportunities contribute to a tourism industry crucial to the state's economy.

Finally, in this issue you'll find information on boating trends and water slides.

New Jersey's Urban Waterfronts

by Elizabeth Chase

Urban waterfronts are special places, rich in natural, cultural, and historical values. New Jersey has a wealth of these urban waterfront lands, each with its own character and redevelopment potential.

The State Department of Environmental Protection's Commissioner, Jerry Fitzgerald English, has identified the revival of New Jersey's urban waterfronts as a key to reversing the plight of its cities. She envisions a "Riverlands Renaissance" occurring. Within the Department of Environmental Protection, the Green Acres Program is focusing attention on recreation as a key element in the total revitalization of urban waterfronts.

There is a critical need for parks and open spaces in highly populated areas. Lands along the water's edge can provide recreation within the urban community without threatening preserved districts. By generating interest, identifying sources of funding, and coordinating with other governmental agencies, Green Acres is helping fulfill this need in New Jersey.

Successful waterfront projects combining recreational, commercial, and other uses have been completed in several major cities throughout the United States including San Francisco, Baltimore, Boston, Seattle, and San Antonio. These projects have ranged from small-scale improvements and linear parks that provide access and community activities, to large-scale, multipurpose developments that combine recreation, housing, and commercial uses.

Several factors have spurred this interest in reclaiming our urban waterfronts. A major nationwide "back to the city" movement is drawing people into urban neighborhoods that are close to the water. The introduction of containerized cargo and the abandonment of railroad properties in the mid-1960s have released

acres of urban waterfront lands for new uses.

The Green Acres Method

New Jersey's Urban Waterfront Program evolved from state concern over urban blight in the late 1970s. The Green Acres effort helps implement Governor Byrne's urban policy by encouraging projects that contribute to the livability of our cities, while taking advantage of water quality and other environmental improvement programs that work toward similar goals.

In 1978, \$200 million was authorized under the 1978 Green Acres Bond Issue. Half of that was designated specifically for urban areas. As a result, the Green Acres Program has launched an initiative to identify the recreation potential of urban waterfronts which often are ignored or abandoned. As part of the Local Assistance Program, special consideration and 90 percent funding are being offered to eligible cities. Funding is also available from a variety of other sources at the state level including the department's Division of Coastal Resources, the Department of Transportation, and the Economic Development Authority, as well as from various federal agencies.

The Green Acres Program encourages urban municipalities to apply for funds, and provides technical assistance in all stages of a project. It offers counsel on the application process itself, and continues to advise throughout the planning, acquisition, and development phases.

A Waterfront Park for Camden

New Jersey is beginning to see the fruits of its efforts on various urban waterfront projects throughout the state. On the Delaware River in Camden, directly across from Penn's Landing in Philadelphia, a \$20 million

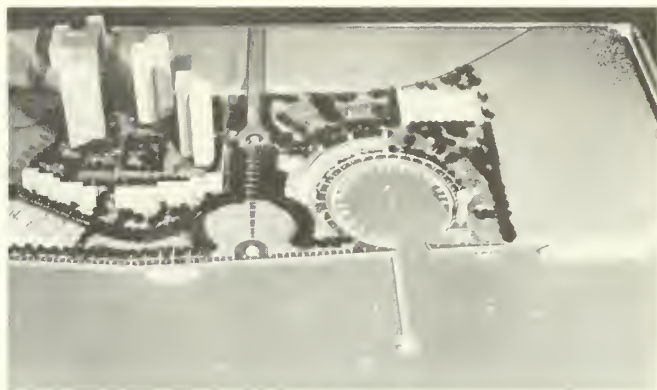


Photo: Courtesy of Green Acres

This model shows the multipurpose waterfront project now under construction in Camden.

waterfront park is under construction.

The 23-acre (9.2-hectares) site was acquired by a matching Green Acres grant to the city, which in turn leased the site to the Camden County Park Commission for \$1 a year for 25 years. The park commission will build, operate, and maintain the waterfront park for the life of the lease. The design and application costs of phase 1 were financed by the city. Development will be funded by a \$2 million Green Acres grant combined with a \$1.6 million grant from the Heritage Conservation and Recreation Service's Land and Water Conservation Fund. This will constitute 90 percent of the funds; the remaining money will come from the city's urban renewal funds.

Construction of phase 1, which should be completed within 1 year, will consist of an entrance promenade, an amphitheater, bulkheads, and a landscaped lighted walkway along the water's edge. In conjunction with phase 1, the city's housing authority is spending \$1.5 million to complete the major boulevard leading to the site, and to build a bridge across the railroad tracks to the park entrance.

Subsequent phases to be completed over the next 4 years include construction of a marina, a boat ramp, floating docks, a ferry and railroad museum.

A Sampling of Other Projects

In Trenton, plans have been made to revitalize the marine terminal as a recreation area within the Economic Development Authority's proposed light industrial park along the Delaware River. The Green Acres Program will assist by funding im-



Photo: Courtesy of Green Acres

In Atlantic City, historic Gardner's Basin Maritime Park contains this replica of the "Flying Cloud" clipper ship.

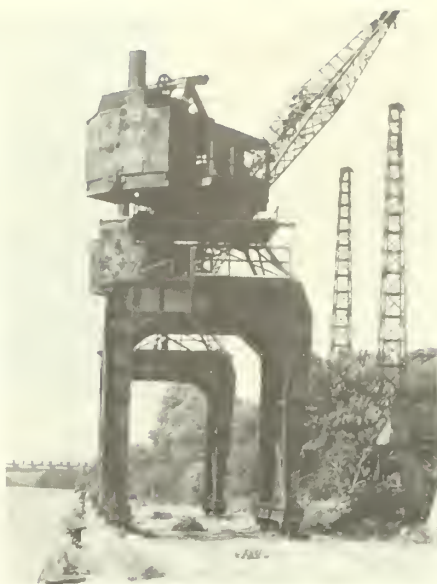


Photo: Courtesy of Green Acres

As part of the proposed light industrial park along the Delaware River, Trenton's old Marine Terminal will be restored and used as a recreation area.



Photo: Courtesy of Green Acres

Banking on a better future, this area of the Hudson River across from Manhattan is scheduled for redevelopment.

provements and new developments, such as a parking area, bulkheads, and a marina, for recreational use around the terminal building.

Farther north on the Delaware, the city of Phillipsburg has applied for funding of its proposed Delaware River Park. This will include both active and passive recreation facilities.

On the ocean side of New Jersey, Atlantic City received funds for restoring and developing its historic Gardner's Basin Maritime Park. The park features a replica of the clipper ship "The Flying Cloud," and other nautical lore. It also provides passive, ecological, and cultural maritime experiences.

The City of Perth Amboy on the Raritan River plans to revitalize its decaying marina and surrounding waterfront area. The project includes restoration of a historic ferry slip.

Newark has been targeted for involvement in the Council for the Northeast Governor's Station Area Development Study. In response, the city has designed a proposal for redeveloping the area abutting the Pennsylvania Railroad Station, which includes a large section of land along the Passaic River. Conceptual plans include commercial, residential, and recreational high-intensity uses, as well as extensive expansion and improvement of the transportation network.

The Port Authority of New York and New Jersey and the New Jersey

Department of Transportation are funding a marketing feasibility study for Hoboken and Jersey City.

Hopefully, the study will lead to development programs for both waterfront areas. The primary target in Hoboken is the waterfront area surrounding the Erie-Lackawanna Ferry Terminal. In Jersey City, the focal point is Exchange Place at the foot of Montgomery Street.

Liberty Park, located on the Jersey City waterfront behind the Statue of Liberty and Ellis Island, was chosen as New Jersey's first urban state park. Still in the development stage, Liberty Park will transform some 800 acres (320 hectares) of derelict waterfront land into an unparalleled regional asset. The park will be built in stages. To date, a 35-acre (14-hectare) plaza on the southern end has been completed, providing a vista of the Hudson River harbor and New York skyline. On the northern end of the park, rehabilitation of the historic Central Rail and Ferry Terminal for use as a cultural and educational center is underway. Construction of a 2-mile (3.2-kilometer) long crescent-shaped seawall connecting the northern and southern plazas will be the next phase.

A Positive Future

If a renaissance is to take place on our waterfronts, we must continue to discover successful redevelopment strategies and techniques; we must

consider each city singly, and insure that redevelopment reflects the character and needs of each community. A successful waterfront project requires the involvement and coordination of the public, private, and commercial sectors. A careful balance of social and economic functions, and public and private sector interests, must be reached at the same time.

An urban waterfront can accommodate an assortment of both active and passive recreational opportunities. These opportunities may be interlaced with commercial, residential, and other mixed-use development. Once visual and physical access is provided, the waterfront becomes open for public use. This encourages further development and interest in surrounding areas.

As we continue to gain experience and expertise, we anticipate a refreshing revival of New Jersey's urban riverfronts.

Elizabeth Chase is a staff member of the Green Acres Program within New Jersey's Department of Environmental Protection.

Safety and Law Enforcement on Chesapeake Bay

by Captain James M. Hurley

The Chesapeake Bay is the largest estuary on the Atlantic. Maryland's portion covers an area of 2,475 square miles (6,435 square kilometers) and has a 3,950-mile (6,320-kilometer) shoreline.

Nutrients from both the rivers and the ocean enable a wide variety of plants and wildlife to survive in the bay. Best known for bountiful shellfish, Maryland's tidal waters are perhaps unmatched by any in the world, offering a favorable environment to oysters, clams, and crabs.

The Chesapeake Bay is also known for its ports, primarily Baltimore, the fourth largest foreign trade port in the United States. The bay also offers a wide variety of recreational opportunities ranging from swimming to sport fishing to boating.

The Natural Resources Police Force exercises vigilant jurisdiction over the following activities that occur in the state's tidal waters because of their importance to the state: 1) recreational boating, 2) fishing and shellfishing, 3) commercial shipping, and 4) dredging and filling.

Currently more than 132,000 registered boats cruise Maryland's waters, and the number increases each year. But many problems have accompanied the great popularity of boats. Increased boating has overcrowded and congested a number of areas throughout the bay. As areas become overcrowded, the chances of accidents increase and conflicts arise between different types of boating activities, such as commercial fishing and water skiing.

To combat such problems, the Natural Resources Police Force has a Marine Division composed of 115 uniformed officers who operate both large and small patrol craft on the bay and its tributaries. In addition, an Aviation Section, which operates out of Martin State Airport, offers air support to the law enforcement



Photo Courtesy of Maryland Natural Resources Police.

Two-person Mobile Enforcement Teams, equipped with speed guns and noise-level meters, selectively monitor boats and respond to complaints.

operation and the search and rescue activities of the force. A five-man detachment also provides support to the Water Resources Administration law enforcement section.

Boating Safety Efforts

During the boating season many of the bay's tributaries, particularly those in the northern portion, experience traffic problems. In addition to the boats registered in Maryland home ports, boaters from other states and people using unregistered boats frequent the bay. Results of the Fifth District Survey (Smith and Linsert, 1971) indicate that 5 percent of the boaters using Maryland waters of the Chesapeake Bay are from out of state, primarily from Virginia, the District of Columbia, West Virginia, Pennsylvania, and Delaware.

Mobile Enforcement Teams—two-man units using a trailered patrol craft—augment the patrol units normally assigned to a given area. Equipped with speed guns and noise-level meters, the Mobile Enforcement Teams conduct selective enforcement operations to reduce excessive speed in posted areas. They also monitor and respond to complaints of excessive noise emission from boat engines. They routinely inspect vessels to insure compliance with safety equipment requirements and fishing laws and regulations.

The Chesapeake Bay is a treacherous body of water. During

the past year, 224 boating accidents involved 312 boats and caused property damage of \$781,000. These accidents also resulted in 35 drownings, 3 deaths from injuries, and 84 non-fatal injuries.

The Natural Resources Police Force has a Boating Safety Education Section that works to prevent such statistics. The section provides a home-study course in boating safety, and working through the state board of education, the section supplies materials for an elective basic boating course in 39 elementary and secondary schools. It offers a 10-lesson boating safety program on four instructional television channels and furnishes teaching manuals and supplements to fourth-, fifth-, and sixth-grade teachers. About half the teachers at this level use the program and an estimated 130,000 children have seen the series. Currently four filmstrips for use in secondary schools are almost completed. These cover basic emergency procedures, rules of the road, hypothermia, fatigue, and boat handling trouble spots.

Because the bay is broad and relatively shallow, its water temperature drops rapidly during the fall, presenting a significant threat to recreational and commercial boaters. Hypothermia kills very quickly. It is essential that a victim be removed from the cold water as fast as possible to prevent his body temperature from lowering. To respond im-

mediately in this situation, the Marine Division uses air support to locate the accident quickly. Usually a patrol vessel is only minutes from any given location on the bay. Once the accident is located, the State Police Medivac Unit is requested to transport the victim by helicopter to a medical facility.

Since the shellfish industry is a year-round operation in the bay, the police must contend with safety problems generated by watermen who work daily, regardless of weather conditions. The only respite comes when the bay freezes over completely. Even then, some hardy individuals will cut holes in the ice to harvest the resource. Last year, five people died while net fishing on the ice.

**Commercial Shipping—
Pollution and Drug Problems**

The movement of large draft vessels into the port of Baltimore has significantly increased since the start of the fuel crisis. Many of these vessels are required to anchor below Annapolis and await their turn at the loading dock. Some may wait as long as 2 months before moving into the port.

This situation presents a twofold problem for the Natural Resources Police Force. The potential for oil spills increases, and there have been several incidents involving the deliberate discharging of pollutants by vessels at anchor. Use of sea and air observation to detect accidental spills or unlawful discharging has resulted in some large fines being levied on steamship companies.

The second part of the problem is more complex. Drug traffic has increased in the state, and some of these drugs are believed to enter the port of Baltimore via foreign shipping. Our personnel have been working in tandem with the Customs Bureau and the Drug Enforcement

Administration to interdict drug traffic on the bay waters with some success.

**Dredging and Disposal of
Dredged Materials**

In the past, material dredged to maintain and improve the harbor channels has been disposed of in open water sites. Adverse impacts on shellfish beds from disposed dredged material have been recognized for many years. Watermen and environmentalists traditionally have objected to open water disposal, and this opposition has resulted in a limitation on the right to dredge and fill.

Dredging and filling are not now permitted in state or private wetlands without state approval. No dredged material containing designated hazardous substance can be disposed of in any manner that would lethally or sublethally affect terrestrial or aquatic ecosystems.

The Natural Resources Police personnel assigned to the Water Resources Administration play an im-

portant role in enforcing the regulations designed to limit the impact of dredging and filling. All dredging activities are monitored intensively by the five-man section. When a violation is detected, a citation is issued and the project is stopped until it is brought into compliance with legal requirements.

What does the Future Hold?

With continued increased usage of the Chesapeake Bay for water recreation, shellfish harvesting, and as an avenue of approach for large shipping, proper regulation is crucial. The role of the bay in the state's economic well-being as well as its role as the state's greatest natural resource must be preserved.

Effective law enforcement will be the key to the bay's continued good health. Because of the complexity of problems associated with the management of this vast body of water, marine enforcement officers must be prepared to broaden their knowledge and expertise in order to meet the challenges of future years. Those challenges are sure to be both difficult and interesting.

Oil spills from large commercial ships cause increasing damage.



Captain James M. Hurley is Training Director of Maryland's Natural Resources Police, which has jurisdiction over recreational, commercial, and dredging activities that occur in Chesapeake Bay.

Photo: Courtesy of Maryland Natural Resources Police

Managing Idaho's Water-Based Recreation

by Robert L. Meinen

Water is one of life's basic elements. Water is also an important component in many of our outdoor recreational pursuits. Particularly in the arid western states, the control, use, and future of water resources are key issues. Idaho is fortunate to have great and varied water resources that offer all types of water-based recreation. However, there is intense competition for water use by many sectors of the population.

The state plays a pivotal role in water allocation and management. Assuming part of this large responsibility, the Idaho Department of Parks and Recreation manages water for outdoor recreation.

The department is a relatively small agency with 21 major park areas containing a total of 41,000 acres (16,400 hectares) of land. Of the 21 areas, 18 have water-based recreation associated with them. Two of our state parks involve cooperative lease agreements with the U.S. Corps of Engineers.

Coordination and Cooperation

Other departmental programs affect the state's role in managing water-based recreation. The department directs the State Waterways Improvement Program that is used to develop and maintain motorboat-related facilities. The waterways program is funded from a 1-percent share of the state's gasoline tax. The grant monies can be used on local, state, or federal lands to develop boat ramps, docks, marinas, and so forth.

Our department also is involved with the Land and Water Conservation Fund (LWCF). As the state liaison for the LWCF program with the Department of the Interior's Heritage Conservation and Recreation Service (HCRS), we are responsible for state and local acquisition and development of water areas. The LWCF program requires that the

states prepare a State Comprehensive Outdoor Recreation Plan (SCORP). This document is a helpful guide to our department in the funding of water-based recreation facilities. The SCORP also serves as a focal point in coordinating federal, state, and local planning efforts in outdoor recreation.

In the past the Department of Parks and Recreation has been the liaison office for the federal Boat Safety Program, administered by the U.S. Coast Guard. Although the program lost its funds in fiscal year 1980, it appears to have been resurrected in fiscal year 1981 with passage of the Boater Bill through Congress. The Boat Safety Program is important to local units of government responsible for patrolling water areas. For example, our department has used the federal Boat Safety Program and the State Waterways Program jointly to help facilitate local law enforcement on federally owned reservoir projects.

The Department of Parks and Recreation stresses its principal role is to provide recreation opportunities, while protecting natural resources. Our department functions both as a direct provider of water-based recreation and as a coordinator. It has a role in all recreation provided by any jurisdiction within the state boundaries. Coordination and involvement in all water-based recreation planning is important in protecting our water resources and assuring continual recreational opportunities. For example, our involvement and coordination with the Department of Water Resources is important to recreation management in Idaho.

The Issue of Water Rights

From a state perspective, water rights are a key issue to water-based recreation. The Department of Water Resources is responsible for planning and authorizing those water rights.

Recreation as a beneficial use of water under a multiple-use concept has not fared too well in the water rights of Idaho.

The present state water plan compiled by Water Resources addresses the needs for state wild and scenic rivers, recreational water rights, and minimum stream flows. However, to date, the legislature has passed few of the recreation and environmental measures into state law. Our department is working with Water Resources to help resolve these issues. We also have obtained special legislation on setting a minimum stream flow for visual purposes in one state park. This legislation has withstood a court test.

Funding Cutback

Several other issues limit or affect our role as a managing agency. One such issue is limited financial resources. This is a problem in many states, but in Idaho, limited funding is compounded by additional factors that require special management techniques.

In 1978, the voters of Idaho passed a 1-percent limit on property tax. This limitation reduced local funding for the public school system. The state legislature made up for the lost local funds with state general fund revenue. This resulted in decreased funds for other departments in the state, but no increase in any state taxes. Staff and operational expenses within our agency were reduced; in fact, employee positions decreased by 7 percent.

The 1-percent funding cuts, coupled with a fiscally conservative legislature over the last 5 years, has forced us to consider several alternatives. The department is now implementing a day-use vehicle entrance fee. Revenue from this fee will be used to improve park facilities. Our major day-use areas are water-based facilities. Con-

Idaho returned this remote picnic area at Barclay Bay to the Army Corps of Engineers.

sequently, the users will pay a greater share of our costs once the legislature provides the start-up funding.

Leasing Reconsidered

Because of limited financial resources over the last 5 years, our agency has carefully evaluated the leased recreation sites we manage for the Water and Power Resources Service. By returning several of these areas to the federal government, we have been able to better utilize our decreased funds.

One area we returned to federal control was the Black Canyon Reservoir recreation site our agency managed for the Water and Power Resources Service. This was a relatively small day-use picnic and swimming area on the reservoir, and the service managed a similar area just below the dam, about 5 miles (8 kilometers) away from our site.

Early in 1979 we approached the Water and Power Resources Service about returning the area to its control. The federal agency agreed that it made management sense for one entity to maintain both areas. In March 1979 the service assumed control of the Black Canyon Reservoir recreation site. Our agency then redistributed the resources that would have gone to the Black Canyon site to other park areas that needed additional operational funds. The Black Canyon area remained open, and there was no adverse public reaction to the transfer.

Areas located at the Lucky Peak Reservoir Project, owned by the U.S. Army Corps of Engineers, likewise, have been returned because of limited funding. The Lucky Peak Reservoir Project lies about 8 miles (12.8 kilometers) east of Boise and attracts many visitors. In 1975, our agency managed seven different recreation sites on the reservoir. The department was experiencing several management problems with the areas. Some of the



Photo Courtesy of Idaho Department of Parks and Recreation

areas were remote, small, and suffered substantial vandalism. The sustained drain on the limited budget by the seven areas meant that we could not adequately run any one of them. This also meant we could not make necessary capital developments on all seven areas to make them more usable.

Our department decided to consolidate its efforts into the two high-visitation areas and return the other five to the Corps of Engineers. Unlike the Water and Power Resources Service, the Corps of Engineers did not agree that it was a good management

move from its perspective. However, the Corps of Engineers has kept the five areas open, although it has not made any substantial capital improvements. Our department has made substantial capital investments to improve the two sites we still manage at Lucky Peak.

The returning of leased lands to the federal government is not a unique phenomena nor is it likely to decrease in the future. In a paper presented at the National Outdoor Recreation Trend Symposium in Durham, New Hampshire, April 20-23, 1980, Gerald R. Purvis of the U.S. Army Corps of Engineers stated that 70 leased areas had been returned. The state of Pennsylvania is in the process of returning six areas to the Corps of Engineers.

This is a problem that must be addressed. The states need more operation monies, and the federal agencies cannot continue to absorb areas and keep them open to the public if this trend continues.

Assuring State Interest

The issue of the operational funding is crucial to both the states and federal government. Cooperation and combined efforts will be the keys to providing services in the future. A state such as Idaho, which is 64 percent federally owned, intends to work with the federal government. However, we have been careful about entering new agreements unless

Spring Shores Recreation Area is one of the two popular swimming and boating areas the state continues to operate at Lucky Peak Lake.



Photo Courtesy of Idaho Department of Parks and Recreation



Photo Courtesy of Idaho Department of Parks and Recreation

Entrance sign attests to interagency cooperation at this state park which is leased from the Army Corps of Engineers.

Idaho's interests are adequately protected.

In 1979, we dropped negotiations on three large recreation sites on Dworshak Reservoir. Dworshak Reservoir, located in northern Idaho, is owned and controlled by the Corps of Engineers.

Two important issues arose in the negotiations for a 50-year lease of this recreation site. The first issue was the equal protection of both parties in the agreement. The problem centered around possible soil slippage in the rough terrain surrounding the new reservoir. The agreement detailed the state's management responsibilities; however, the Corps of Engineers would not agree in writing to repair or protect the site if soil slippage damaged the recreation facilities.

The next problem in the negotiation involved the design of the sewage disposal at each site. Originally, the Corps of Engineers agreed to a barging system to a central sewage plant. The Corps of Engineers agreed to cover the operational costs of that system. When the final design was returned from the Corps for our review, it detailed elaborate sewage disposal plants at each site. The plants involved pumping stations and would require an extra employee to run the system. The state was expected to pick up the operation and maintenance costs that had replaced the barging system. This made the

cost too high for Idaho, considering that the legislature was getting ready to cut the one full-time employee and operational expenses we had designated for these new areas. The Corps of Engineers went ahead on its own and developed the areas.

Future Directions

State park and recreation agencies certainly should continue their involvement in all areas of water-based recreation management. Yet there are several factors that will affect the states' involvement that the federal government and the public should keep in mind.

State agencies now must evaluate carefully what increases in personnel and operation expenses they can afford to incur in leasing agreements. States also must make sure that the recreation areas they lease are manageable units in terms of location, design, and size. When they enter cooperative agreements with federal resource agencies, states should be allowed to retain management flexibility. Likewise, states should require equal protection and a clear statement of the federal agency's responsibilities in all agreements on leased areas. The issue of sharing the operational costs on federal recreation projects must be addressed by the federal agencies.

Both the federal and state governments need to be involved in water

recreation. Their combined efforts can provide the recreating public with better facilities closer to home at less cost.

Robert L. Meinen is Deputy Director of the Idaho Department of Parks and Recreation in Boise.

Water and Power Boosts Recreation Opportunities

by Kathy Brocato, Ph.D.

In 1869, Major John Wesley Powell boated down the untamed Colorado River and explored the American West. He reported that, "The West is an arid land, hostile to farming . . . and will never be settled . . . opening up its great resources to America . . . unless the Government dams the rivers . . . saves up winter and spring runoff in artificial lakes and reservoirs."

The Water and Power Resources Service (Water and Power), formerly the Bureau of Reclamation, has since dammed many of those rivers. The agency has created hundreds of artificial lakes and reservoirs and thousands of miles of canals throughout the 17 western states. While supplying water for farms, factories, and communities, these bodies of water also provide opportunities for water-based recreation.

Beginning of Recreation Development

During the early years of reclamation, recreation was not considered important in the planning and development of water resources. However, as soon as reservoirs filled, they became recreational focal points. Several of the initial Water and Power projects established excellent reputations as recreation areas. Completed in 1911, the Theodore Roosevelt Dam was the first major construction undertaken by Water and Power on the Salt River Project. Roosevelt Reservoir, located 30 miles (48 kilometers) northwest of Globe, Arizona, was a well-known resort in the early 1900s. As one of the main attractions along the Apache Trail, a popular auto route between Globe and Phoenix, the resort drew many visitors each year. A large hotel was built along the shore of the reservoir near the dam to accommodate the increasing crowds of visitors. Thousands of visitors enjoyed the horseback trails each summer, as well

as boating and swimming at the reservoir.

In 1936, Water and Power entered into agreements with the National Park Service to provide tourist facilities at Hoover Dam's Lake Meade and Grand Coulee Dam's Roosevelt Lake. Since that time, Water and Power traditionally has established agreements that transfer responsibility for managing recreation areas to other federal land-managing agencies, or to local organizations such as state and county governments and water-user organizations.

Recreation Management Today

Today there are almost 300 recreation areas associated with Water and Power projects. Federal agencies are responsible for less than half of these areas. Federal managers include the U.S. Forest Service (51 areas), Water and Power (48), the U.S. Fish and Wildlife Service (15), the National

Park Service (10), and the Bureau of Land Management (3). The remaining recreation areas have nonfederal local managers. State governments manage 104; county governments, 30; water-user organizations, 10; and other organizations, such as the East Bay Regional Park District in California, 7.

Local managing agencies administer diverse areas and offer a variety of recreation opportunities on project lands. While a local agency agrees to develop and/or operate and maintain recreation facilities, Water and Power attempts to assist and cooperate with them in this venture. The following examples indicate different types and sources of federal funding and cooperation.

Special events such as sailing regattas attract participants and spectators to Water and Power reservoirs.



Photo: Courtesy of Water and Power Resources Service

Carter Lake, Colorado

Carter Lake, part of Water and Power's Colorado Big-Thompson Project, was completed in 1952. Located 12 miles (19 kilometers) from Loveland, Colorado, the lake was formed by enclosing a natural basin with two dikes and a dam at the natural outlet. The waters and lands surrounding Carter Lake are managed for recreation by the Larimer County Recreation Department. The original authorization for the Colorado Big-Thompson Project did not include a provision to construct, operate, or maintain recreation facilities.

In June 1954, through a memorandum of understanding between Water and Power and Larimer County, the county assumed responsibility for administering recreation at the lake. This agreement allows the county to collect fees and use them to improve the lake's recreational facilities. All proceeds from boating permits, use fees, and concessions go toward the operation and maintenance of recreation areas and facility improvement.

In 1965, Congress passed the Federal Water Project Recreation Act (Public Law 89-72). This law allows the federal government to contribute funds for constructing recreation facilities on water project lands when matching funds are provided by a nonfederal entity. All operation, maintenance, and replacement costs must be assumed by the local organization. Federal participation in recreation development at water projects constructed before 1965 is restricted to reservoirs. Recreation facility development at pre-1965 areas is further limited by a \$100,000 ceiling on the federal contribution.

The Larimer County Recreation Department has taken full advantage of PL 89-72 to receive the maximum \$100,000 of matching federal funds. Most monies from PL 89-72 funding have gone toward constructing a con-



Photo: Courtesy of Water and Power Resources Service.

crete boat ramp and parking area on the northwest portion of the reservoir, and a sanitary dump station on county road number 8E. This paved road becomes the eastern entrance to the Carter Lake recreation area.

The Land and Water Conservation Fund Act of 1965 (Public Law 88-578) also provides funding to nonfederal governmental agencies to acquire lands and develop recreation facilities for the general public. Like PL 89-72, this funding depends upon matching funds from the Larimer County Recreation Department. Constructing a rest room with handicap accommodations has been the first use of this funding.

The Soil and Moisture Conservation Program is another vehicle Water and Power uses to assist the county in developing the recreation potential at Carter Lake. Many existing parking facilities in conservation areas and interior roads have

Recreationists enjoy boating on Water and Power reservoirs like this one near Amarillo, Texas.

been constructed using this funding source. Monies from this program also help provide supplies for Water and Power's youth programs—the Young Adult Conservation Corps (YACC) and the Youth Conservation Corps (YCC). The YACC program provides employment and other benefits to young men and women between 18 and 23 who would not otherwise be productively employed. The purpose of the YCC is to develop and maintain the natural resources of the United States by employing America's 15 to 18 year olds, thus preparing them for the ultimate responsibility of maintaining and managing these resources. The YACC and the YCC are an integral part of Water and Power's overall work plan



Photo: Courtesy of Water and Power Resources Service

A fisherman admires rainbows taken from the Bighorn River just downstream from Water and Power's Yellowtail Afterbay Dam in Montana.

Three cycling enthusiasts set out on the Folsom South Canal Recreation Trail in California.



Photo: Courtesy of Water and Power Resources Service

on the Colorado Big-Thompson Project, and have helped develop and maintain recreation facilities at Carter Lake.

Carter Lake is a recreation resource of regional significance, because of its mild summer climate, good fishing, mountain scenery, clean air and water, and adequate vegetative cover. Low user fees and good access also attract visitors to the area. Existing facilities include 4 campgrounds, 8 picnic areas, a swimming beach, 3 two-lane boat launch ramps with parking for 155 cars with trailers and a capacity for 35 boats.

Recreation demand is already beginning to exceed supply at Carter Lake. Since all PL 89-72 cost-sharing funds have been spent for Carter Lake, Larimer County will be using money from its recreation fund, fees derived from special-use permits and leases, and money from the Land and Water Conservation Fund and Soil and Moisture Conservation Fund, or a combination of these sources to develop the additional facilities needed.

In addition to developing, operating, and maintaining facilities at Carter Lake, Larimer County actively manages recreation areas associated with Water and Power projects at Flatiron, Horsetooth, and Pinewood reservoirs.

Bike Trail along the A-Canal in Klamath County, Oregon

While recreation facilities frequently are developed near reservoirs, such development by Water and Power along canals is fairly recent and unusual. In 1978, Water and Power negotiated an agreement with Klamath County and the Klamath Irrigation District to construct a bike and foot path along the south and west bank of the A-Canal. The irrigation district assumed responsibility for operating and maintaining the canal in 1954. The county constructed the pathway and a barrier fence, using county and state funds. Prior to actual construction, the county raised the banks of the canal to provide adequate freeboard for canal operations. The county also operates and maintains the path at no expense to Water and Power or the irrigation district.

The bicycle trail has contributed to a sense of community pride. The Klamath Falls Garden Club planted, and now maintains, a small garden area at the beginning of the trail. About midway through the trail, Water and Power's Klamath Project YCC developed a small picnic and rest area in cooperation with the county. A distinctive addition to Klamath Falls, the bike trail has provided ready access for bicyclists, joggers, and hikers into the central Klamath Falls area. Advantages to

Water and Power include a fence built on the canal side of the bike trail. Since the county now maintains the licensed area, which extends from the fence to the toe of the A-Canal, the irrigation district no longer must be responsible for weed control in this area.

The irrigation district reports no operational difficulties as a result of the bike trail, although its crew must take extra care when doing maintenance work on the canal. The irrigation district also feels that the people using the canal banks become, in effect, ditchriders, seeing and reporting various leaks and irregularities in the canal. If a break did occur in the canal, it might be caught sooner because of the frequent use of the bike trail by the public. Testimony to the success of the bike trail is that all parties, including the irrigation district, the county, and Water and Power, are in favor of extending the bike trail an additional 3 miles (4.8 kilometers) into the suburban area of Klamath Falls. The county is actively seeking state and county funds for this endeavor.

Agency Need for Recreation Authority

Public Law 89-72 provides federal authority for Water and Power to accommodate recreational use of project areas. This law requires that a nonfederal agency share the costs of developing recreation facilities with



Photo: Courtesy of Water and Power Resources Service



Photo: Courtesy of Water and Power Resources Service

Water and Power lacks the authority to properly manage pre-1965 recreation areas that have been returned to or retained by the federal government.

the federal government and accept full responsibility for operation, maintenance, and replacement of the facilities. Water and Power is managing only a few areas with specific authority; however, the agency presently has custody of more than 40 areas because local agencies either would not assume responsibility for recreation management or returned previously managed areas. Approximately 20 additional areas may be returned within the next few years. All but one of the recreation areas Water and Power now manages and most of the areas it expects to manage are associated with pre-1965 water projects.

The main reason areas have been returned to the federal government is financial in nature. Recreational use of these areas began before recreation was legitimized as a project purpose under PL 89-72. Recreation facilities were developed at a number of access points around the reservoir to accommodate this already existing use. The federal contribution to recreation development is limited to \$100,000 at pre-1965 areas and a combined federal/nonfederal cost share of \$200,000 does not provide for many facilities.

Hence, facilities soon became inadequate and overused. Often, local managers were barely able to maintain these scattered facilities, let alone expand them to keep up with increas-

ing demand. Similarly, potential local sponsors sometimes refused to assume responsibility for recreation management at an area because they anticipated a financial burden on the local residents.

PL 89-72 does not give Water and Power general authority to develop or operate and maintain the necessary recreation facilities when pre-1965 areas are returned to the federal government for recreation management. However, the public still insists on using these areas for recreation. In some locations, this has resulted in unregulated development, unsafe or substandard facilities, and environmental degradation. It is difficult to maintain minimal health and safety standards at these areas with the limited resources presently available to Water and Power.

Water and Power is proposing legislation to improve recreation on project lands by amending PL 89-72. The amendment proposed would provide the Secretary of the Interior (acting through Water and Power) with broader and more flexible authority to deal with recreation management problems. With respect to pre-1965 water projects, the legislation would 1) make all water projects, rather than just reservoirs, eligible for federal matching funds for recreation facilities; 2) eliminate the \$100,000 ceiling on the federal contribution for recreation facilities; and 3) give Water

and Power authority to develop recreation areas to a level of minimum facilities and manage the land without a local cosponsor.

Water and Power intends to continue its policy of seeking and cooperating with nonfederal local managers of recreation areas whenever possible. However, the proposed amendment would give the agency the means to properly develop and manage areas for which it must accept responsibility. Water and Power believes a comprehensive program involving both federal and nonfederal participation is necessary to ensure recreation opportunities for this and future generations.

Dr. Kathy Brocato is with the Operations and Maintenance Policy Staff of the Water and Power Resources Service in Washington, DC.

Recycling Detroit's Riverfront

by Harriet Sapperstein

On the Detroit riverfront, some 30 sites are currently undergoing change. They represent more than a billion dollars of present investments, immediate commitments, and future proposals—both public and private. About \$500 million has been spent during the last 5 years on various projects, including Renaissance Center—the successful \$350 million hotel, office, and commercial development that has symbolized a major turnaround for the city. Illustrating the aggressive use of public-private coalitions by Mayor Coleman A. Young, another \$500 million has been proposed for additional housing, commercial, transportation, and recreational projects in the next 5 years. These ventures include two major riverfront housing projects adjacent to the civic center and central business district, and several major park developments and expansions.

These new recreational developments total more than \$100 million. Improvements to recreational

properties and new parks include major investments to Belle Isle (\$13 million) and Hart Plaza (\$31 million), construction of the new Joe Louis Sports Arena and garage (\$55 million), new seawall/fishing bulkhead and boat launching facilities at parks already in active use (\$4 million), and acquisition and development of about 50 acres (20 hectares) of valuable riverfront land as parks mainly within 3 miles (4.8 kilometers) of downtown in the Linked Riverfront Parks, Marina City, and Riverside Park Extension projects (\$10 million so far).

While the size of these investments may seem overwhelming to recreational planners in smaller communities, the process is the same for everyone. It includes analyzing needs, building coalitions, locating funding, preparing proposals, grabbing opportunities, and living with frustration, tension, and occasionally, success. We hope other communities can benefit from some of our experiences.

Belle Isle

Detroit's major riverfront facility is Belle Isle, a 1,000-acre (400-hectare) jewel located 3 miles (4.8 kilometers) from downtown. Belle Isle is a green oasis holding a variety of facilities. It draws more than 8 million people a year to its unmatched natural and man-made attractions. Detroit has invested \$13 million in its maintenance and operation.

In the 1960s, Belle Isle was undervalued as a recreational resource, with little activity, fewer people, and a lost history. The reputation was far worse than the reality: it has *always* been an island of respite and delight for those willing to walk or drive across the MacArthur Bridge. But the tensions of the larger community were perceived as existing at Belle Isle

Joe Louis Arena, Cobo Hall, Hart Plaza, Ford Auditorium, and Renaissance Center make the Detroit riverfront a vital gathering place.



Photo: Courtesy of the City of Detroit

as well. It was certainly not maintained at the physical standard it could and should have been, because there had not been sufficient investment in upkeep and development for some years.

As part of Mayor Coleman A. Young's campaign commitments in 1973, a concerted thrust towards rehabilitation and renewal of the island began. This effort was a model for later riverfront development on the mainland, for the improvements had to draw on a variety of public and private funds, gain support from several citizen advisory groups, and as improvements took place, utilize publicity and promotion to change Belle Isle's image from moderately negative to highly positive.

Funding Sources

Funds for the improvement of Belle Isle have come from many sources. "Structural" improvements such as the roads, curbs, and pathways utilized the city's allocation of state funds

derived from fuel and license fees. Capital bonds financed improvements to the Casino Building and Plaza, which serves as a concession and year-round senior citizens' center, to the Scott Fountain and Lagoon, and the Conservatory. Moreover, matching funds for all grants helped cover the constant cost-overruns that plague every major capital project.

The Michigan Recreation Bond Fund, a special one-time fund available to communities throughout Michigan during the early 1970s, and the federal Land and Water Conservation Fund were used to rehabilitate a regional athletic facility, picnic area, and fishing piers. State funds also helped construct a new urban nature center that serves groups throughout the metropolitan area.

Private donations were teamed with public funds to create the Playscape, an acre-wide children's play area. The Junior League of Detroit paid for the design and the

department's own staff constructed the facility.

Other groups such as the Friends of Belle Isle contributed toward trees and a master plan, which serves as a guide for the island. The Zoological Society drew on its allocation of local capital funds and its own supporters to build a "Walk-through Safari" where the animals roam "free" and the visitors walk on boardwalks above the dens and meadows. Special state funds, reserved for fishing, were used for stocking the Detroit River so that Coho Salmon are returning, to the delight of the area's many avid fisherman. (Fishing is one of the most popular sports in this urban setting!)

Belle Isle, Detroit's 1,000-acre (400-hectare) island park, has had \$13 million in improvements over the last 7 years and now draws 8 million people a year to its extensive recreational facilities.



Photo: Courtesy of the City of Detroit.



Photo Courtesy of the City of Detroit

Still under construction is the Kresge Promenade, which is utilizing foundation and city funds to restore a historic lagoon and create a pedestrian esplanade connecting six intensively used indoor facilities. Continuing allocations are needed to improve picnic shelters, comfort stations, and other facilities required by the large groups of picnickers who enjoy the island's meadows and facilities.

Problems

The important thing to note in this listing of funds and projects is the many needs that had to be met by a variety of sources. Major problems do exist: both the extent and kind of development have been fought by some citizens. The value of preservation often conflicts with the increased activity and use. Even with the appointment of a park manager, whose concern for the island has improved matters immensely, the level of maintenance often is insufficient for the level of use. With increased operational cutbacks, maintenance cannot ever keep up with its demands. Many of the facilities first improved 7 years ago are ready for a new round of rehabilitation. Sunday afternoon crowds detract from the pleasure of the experience when traffic jams create delays in getting off

the island. As further funding cutbacks occur in the next few years, the conflict between concentrating development funds on Belle Isle or allocating more to other sites will grow more acute.

A hundred years ago some citizens argued against the purchase of Belle Isle, suggesting that the \$200,000 purchase price would be better used to buy small parks throughout the city. No one would argue the value of that purchase today. In the same vein, cities must value their special resources and must be willing to support them in major investments of capital and operating resources. In the case of Belle Isle, the city's concentration on island improvements has been worthwhile, and has had spinoff in terms of people's willingness to recognize the importance of such major investments and long-range development, not only on the island but along the mainland of the riverfront as well.

Hart Plaza

In the European tradition of urban plazas, Hart Plaza is not a green park. Although it does have landscaping, the plaza is primarily a hard surfaced area with various activity spaces that can support hundreds of thousands of people each day.

The two-level Hart Plaza adds a feeling of excitement and drama to Detroit's riverfront.

The plaza was part of a larger dream for an entire civic center area, a dream that has taken more than 2 decades to complete. First came buildings: the city-county government office building, which required the relocation of a 125-year-old church across the street; Cobo Hall, a major arena with immense exhibit halls that handle massive mining equipment as well as micrometers or sample clothes; the Ford Auditorium, which holds the internationally famous Detroit Symphony as well as local high-school graduations and visiting barbershop quartets; and the Veterans Memorial Building, with office space and public meeting rooms. Most of the buildings were constructed in the mid-'50s, but for a number of reasons, the construction of the open space could not move from plan to reality until the 1970s.

In some respect this delay has been functional. As the city's need for space on the riverfront increased, the pressure also increased to include a number of activity spaces in the plaza that were not anticipated in the early stages of planning. This resulted in the actual doubling of space from 12

to over 20 acres (4.8 to 8 hectares) by building a two-level plaza.

Two major changes, which occurred in the early 1970s, changed Hart Plaza from its original design as a pleasant open space on the river to a dynamic place people can visit on a summer day.

Ethnic Festivals

In the early 1970s, Detroit began to sponsor ethnic festivals. These popular weekend activities seemed to meet the needs of the community to find some multi-ethnic orientation that would help break down polarization along black/white lines and create positive feelings about the variety of Detroit's cultural heritage. Although sponsored by the city, each festival was actually organized and operated by a coalition of nonprofit ethnic/cultural/religious agencies. These agencies, symbolic of their constituents' cultural heritage, soon became money raisers, for the nonprofit groups could keep any funds raised from food and concession sales and apply them to recreational, educational, and cultural programming.

The festivals were held along the riverfront, a setting that made the entertainment even more enjoyable. Once again people began to realize how delightful the riverfront is to look at, stroll along, and be near on a warm summer afternoon or evening. As the ethnic festivals kept growing beyond their sites, it became apparent that a permanent space on the riverfront, protected from the weather, was needed for the festivals. This space would have to handle major crowds, include flexible entertainment areas, and supply a food-service facility that could handle

20-30 different amateur vendors each weekend.

While the festival committee members were meeting with the architects and designers of the Civic Center Plaza, Mrs. Horace Dodge, an extremely wealthy resident, died, leaving \$2 million for a "fountain at the foot of Woodward Avenue." Now private funds became available to complement the public funds set aside for the basic construction of Hart

Plaza—covering such costs as the building of an underground garage, relocating a major street, and moving a major sewer line.

Thus the tone was set to make the plaza a major aesthetic amenity. Designs for the fountain and its surrounding plaza were solicited nationally. Isamu Noguchi's vision of the fountain, with an entrance sculpture called Pylon, and an exciting use of the plaza space, won the



Ethnic festivals fill Hart Plaza with lively entertainment, interesting food—and fun!

Photo: Courtesy of the City of Detroit

recommendation of the reviewing committee and was accepted by the mayor and council.

In 1972, construction of the two-level plaza finally began. Among its features were an amphitheater offering entertainment in the summer and an ice-skating rink in the winter; a smaller theater towards the river edge with large stepstones for viewing movies, theatrical performances, or the river itself; a major food-service facility housing 26 self-contained food preparation areas and 4 built-in beverage booths; and other features including a cultural arts exhibit area, festival and Detroit Symphony offices, a privately operated restaurant, and extensively landscaped areas for sitting, walking, and promenading at the river's edge.

The Dodge Fountain and Philip A. Hart Plaza officially opened in 1979. So far, the festivals have drawn more than 6 million people each summer.

Operationally, the plaza is an interdepartmental facility. The Civic Center Department maintains the structure and its ultra-sensitive computer-controlled fountain. The Recreation Department is responsible for programming and activities.

Since it opened, the major problems encountered by Hart Plaza have been related to its success. We underestimated its use and did not include sufficient comfort facilities. We underestimated its evening use and did not install adequate lighting at the extremes of the facility. We underestimated the interest in skating, thus the rink is far too small, although it could not have been much larger due to its alternate use. We underestimated the demand for festival space so that we have to tread a thin line in order to serve all the groups that would like to sponsor activities each summer. We now run festivals from the first week in May through September at Hart Plaza, and

two additional riverfront parks began holding concerts last summer. On the other hand, in contrast to the extreme crowds that the plaza attracts on a summer weekend, spring or fall afternoons can find the space almost empty—with only an occasional sleeper, sun-worshipper, or visitor.

Hart Plaza is very much a people place. People seem to have a good time whether they are there for a few moments alone or among the crowds for several hours. But it also can be a windswept space with very few people on a cold November afternoon; then it appears to be a shell waiting for activity. It will be interesting to see how we can expand the use of the plaza as the festivals become "old hat" and new activities grow popular.

Future Planning: Linked Riverfront Parks

Although every major city plan and policy statement since 1947 called for "more and better public access" to the riverfront, other forces such as industrial needs took priority in terms of land use. It was not until the mid-1970s that four governmental threads—federal, state, county, and local—came together to weave a new waterfront pattern that continues to drastically change the shape and use of the Detroit riverfront. Local efforts focused on the 3-mile (4.8-hectare) stretch of riverfront between Hart Plaza and Belle Isle to the north. With an expanding residential population located just 0.5 mile (0.8 kilometer) north of the river's edge, it seemed time once more to try to establish recreational access in this mixed-use area of warehouses, industries, cement silos, and parking lots.

The Recreation Department requested funds from the former Heritage Conservation and Recreation Service (HCRS) for a major acquisition and development project. It was

called Linked Riverfront Parks to reflect the city's goal of developing a park system, connected by a bicycle/pedestrian pathway that would create new people places on the riverfront. In 1978, after several years of internal planning and close cooperation with many city departments, a special Land and Water Conservation Fund (LWCF) contingency grant for \$2.3 million, matched with city funds, energized the project.

While acquisition of three park sites began with the LWCF funds, Coastal Zone Management (CZM) technical assistance funds were obtained to hire consultants to detail the exciting new recreational and development approach for the area. CZM funds were crucial; they enabled the recreation department to do broad-based planning in cooperation with other departments and agencies, rather than site-limited designs. Thus the park designs were related to potential housing nearby; to commercial warehouse conversions; and to improved traffic patterns, which could boost business and industries that remained in the area, as well as create recreational access onto and along the river's edge. CZM, HCRS, and city funds worked in tandem for design and development, accelerating the entire process by several years.

The linked parks designs include two major concepts: first, park nodes create 10-14-acre (4-5.6 hectare) openings onto the river's edge; and second, linear bicycle/pedestrian connections form linkages. The linked parks are seen as recreational amenities and catalysts for other economic developments. They are the physical threads that connect the entire area. These concepts have been reviewed and accepted by the Interdepartmental Riverfront Task Force, coordinated by the director of the Planning Department, and including the

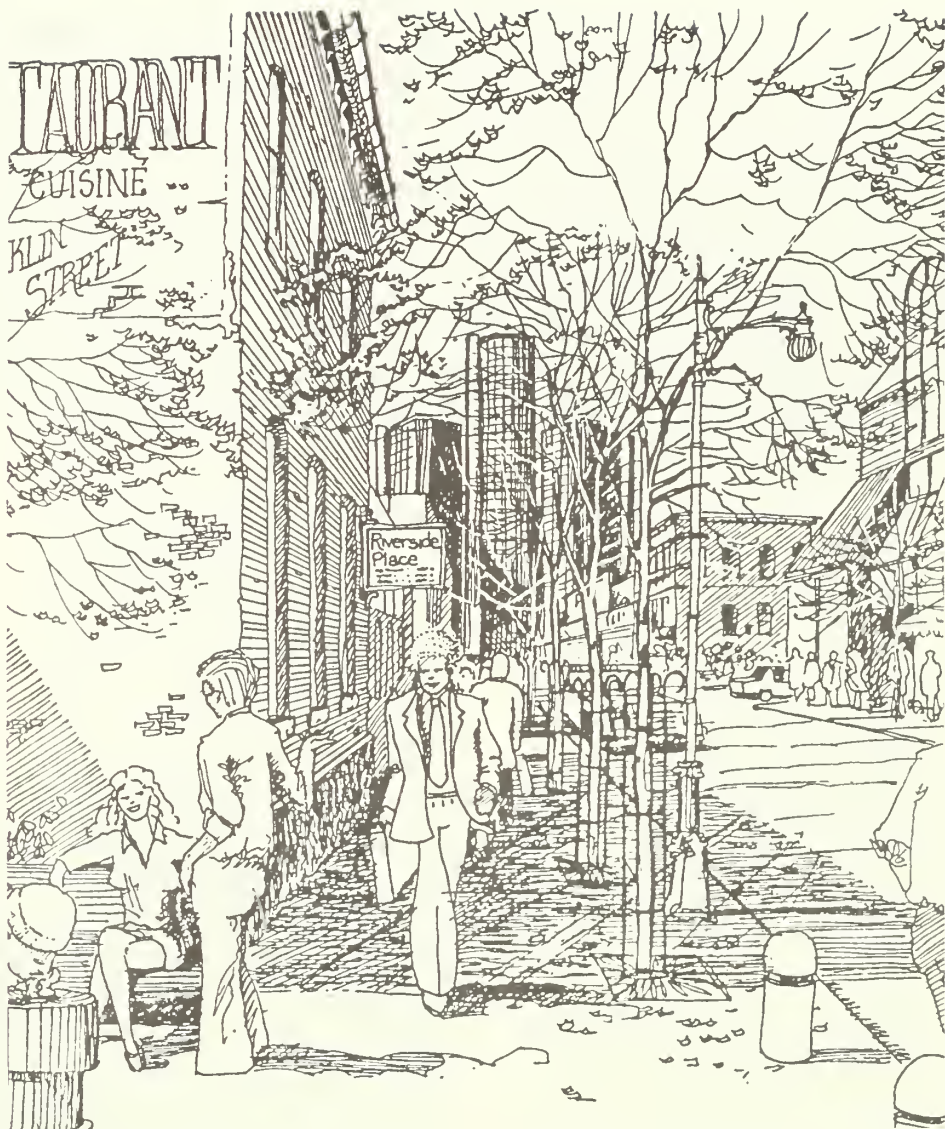
Departments of Transportation, Community and Economic Development, and Planning and Recreation.

Present Status of Linked Parks

Using additional LWCF and city funds, construction of the first park is targeted for 1981. A short-term, street-based, bicycle/pedestrian connection also will be implemented with additional CZM and city funds. Further research on an interpretive center and integration of potential adjacent river edge easements is also underway. Both the general concepts and the wealth of background and technical detail (such as aerial slides, alternative seawall designs, bicycle/pedestrian path standards) developed in previous studies continue to be useful to other riverfront projects as well as the linked parks themselves.

New projects sponsored by private interests have been announced within the last few months. A major commitment for a mixed-use development of approximately 70 acres (28 hectares) was made in October 1980. Riverfront housing, sponsored by the developers of the Renaissance Center Office and Hotel Development, will include a river edge public promenade, thus continuing the linear connections from the linked park sites to Hart Plaza. The reconstruction of the Shakespearian Globe Theater, first suggested by Wayne State University, has been integrated into the linked parks concept and will utilize one of the park sites. The Globe will bring visitors and researchers to its theater and museum, thus enlarging the possible park uses. As a cultural resource and an economic stimulus, the theater and the linked parks complement one another.

On the other hand, present levels of available funding can only cover the basic construction of the parks and linear connections. Future fund-



ing for more creative urban park concepts—such as a transient marina/lagoon, or purchasing easements to ensure continuous public access around private developments—seems to be limited. Funds seem to shrink just as inflationary costs and problems expand. Even the Globe Theater must find massive public support to reach its potential.

The linked parks are at an early stage of development, in contrast to

Hart Plaza and Belle Isle. But we anticipate it will be another people place, unique to Detroit, and enjoyable by all.

Harriet Sapperstein is Principal Planner for Detroit Recreation Department.

Producing Better Sport Fish

by James E. Weaver, Ph.D.

The air is crisp and still along the rushing creek as a reddish tinge in the eastern sky announces dawn. Only moving water disturbs the silence. Occasionally a fisherman's fly wishes through the air to plop gently in a swirling pool below a submerged log. Suddenly the line tightens and strains; the pool erupts in a silvery shower to illuminate the majestic struggle of a rainbow trout.

After the battle is won, the fisherman examines his colorful 6-pound (2.70-kilogram) prize and contemplates the deep inner feelings associated with this experience. Far from the fisherman's conscious thoughts are the myriad of scientific disciplines and research efforts that maintain and enhance the diverse and valuable fishery resources of our nation.

Consider that the Department of the Interior, through the Fish and Wildlife Service, has one of the largest research programs in the world on freshwater fishes and their environment. Research is conducted at 11 national laboratories, 26 field stations, and 26 cooperative fishery research units that examine critical problems in fish husbandry, ecology, and contaminants. Much of this effort directly relates to recreational fisheries. The research aims to increase the knowledge about and improve the management of fishery resources, whether for increased usage or strict protection.

Research Support of Hatcheries

The 88 production hatcheries within the National Fish Hatchery system annually stock over 160 million fishes, representing 30 or more species. The likelihood of catch-

ing a fish that has been spawned, reared, and introduced through this system is great. Because fishes get sick, require a well-balanced diet, suffer from stress, and need a suitable growing environment when raised under contained hatchery conditions, research on problems associated with fish health, nutrition, culture systems, and other aspects of fish husbandry is essential.

Healing Sick Fishes

Fishes are susceptible to a variety of harmful viruses, bacteria, and parasites. The impact of these pathogens generally is most pronounced when fishes are stressed either in the natural environment or under hatchery conditions. When a serious disease breaks out at a fish hatchery, it can have a devastating effect on production.

Research aims, therefore, toward developing and refining techniques to detect and identify pathogens. A

recently developed technique can now diagnose several important fish illnesses, such as kidney disease, enteric redmouth disease, and furunculosis. This microscopical procedure uses a fluorescent dye that, when added to a sample of infected tissues and examined under ultraviolet light, readily exposes the presence of bacteria. The method is quicker and 10 to 100 times more sensitive than standard procedures.

Once a disease is diagnosed, treatment can be started in hatchery systems. Research is underway to define the fastest and most effective methods of treating sick fishes. To protect humans from potential harm, all chemicals and drugs used on food fishes must be approved according to the guidelines and regulations of the Food and Drug Administration. Clearance of a drug or chemical such as formalin for fish parasites, may require up to 5 years and \$6 million in research and development funding.



Scientists from the National Fish Health Research Laboratory sample blood from Atlantic salmon to assist in disease prevention.

Photo: H. Monte Stuckey, Fish and Wildlife Service



Photos: Fish and Wildlife Service

Additionally, if the chemical or drug is released into the environment in any way, such as in a hatchery effluent, registration with the Environmental Protection Agency is required. This doubles the amount of time and money spent before the substance actually can treat sick fishes. Experiments are now underway to develop vaccines against certain fish diseases. These substances would not require such stringent registration procedures.

Fish Nutrition

Fishes can be very particular about what they eat under controlled conditions. Not only must the energy, carbohydrates, protein, amino acids, vitamins, fatty acids, and mineral content be proper for survival and growth, but the food must be attractive and palatable to the fish. Nutritional requirements may change at different stages of fish development. Deficiencies in required nutrients can decrease growth and stamina, can induce physical abnormalities such as skin lesions, unusual pigmentation, and cataracts, or can contribute to reproductive failure, and even cause death. None of the above are acceptable in the production of fishes for stocking. Recent research has identified many of the nutritional needs of fishes. For instance with inadequate

vitamin C, salmon and trout may exhibit spinal curvatures, eye lesions, hemorrhagic skin, liver, kidney, and muscles, and altered connective tissue. Additional vitamin C in the diet helps prevent these conditions, all other factors being equal.

Stress

Federal employees now learn how to manage stress in the work environment. Fishery research, likewise, is discovering ways to reduce or control stress in fishes.

Stress related problems in fishes may range from lethargy and poor growth to death. Studying stress is complicated because many inter-related factors, such as pathogens and nutrition, affect the body chemistry of fishes.

However, stress is most likely to be observed in fishes held at high densities for rearing or transport, or exposed to unusual environmental conditions, all of which may occur under hatchery situations. For netting and transporting striped bass hybrids, research indicates that a measured combination of a water-soluble anesthetic and salt reduce the impact of stress to an acceptable level.

Selective and Cross Breeding

The concept of genetic manipulation brings to mind an eerie scene

Underwater observations and photography are part of the Fish and Wildlife Service's research investigations of fish populations in reservoirs.

with a cloaked figure hunched over bubbling test tubes. Actually, the mechanics of genetic manipulation in fishes are less photogenic, although the results are often quite startling. Through selective breeding for desirable characteristics, new strains of fishes can be developed that exhibit traits such as increased growth in hatcheries and in the wild, increased catchability and survival in the wild, increased resistance to diseases, and increased tolerance for crowding.

Research has developed one strain of rainbow trout that is 86 percent heavier at a year old than an unselected control group. The foundation of modern agriculture, such selective breeding is just beginning in fish husbandry. Its practical applications include more and larger trout for recreational fishermen in years to come.

Another aspect of genetic manipulation is the breeding of two different, but closely related, species to develop a hybrid. For instance, research shows that the breeding of a male striped bass with a female white bass yields a fish hybrid that generally exhibits greater growth rates and

more hardiness at younger stages than the parent species. Such hybrids can be stocked to offer the fisherman a faster growing fish and, since hybrids are typically infertile, there is no concern about their overpopulating a pond or lake.

Aquacultural System Improvements

Advances in culture system design and technology are critical to adapting fish husbandry to the realities of the modern world. Many areas of the country lack adequate fresh water; others have severe problems with water quality. The development of an aquacultural system that recirculates water, rather than using the classical "in one side and out the other" approach, is a major step in conserving precious water resources.

Such a system has been developed and tested on a small scale, and the results to date are encouraging. Atlantic salmon gained about twice the weight in this system as a com-

parable group maintained in colder flow-through hatchery water.

Another benefit is that recirculating systems require significantly less electricity to pump the water than do flow-through systems that need constant pumping from deep wells.

Since land is also at a premium in most localities, the more fish produced in a unit measure of water, say a 1-acre (0.4-hectare) pond, the more efficient the system. Research shows that the use of continuous aeration in channel catfish ponds can increase production threefold.

This aeration can be supplied by air pumps connected to underwater airlines at certain intervals. This constant bubbling creates a circulation in the pond water, which increases the oxygen content by exposing more water to the pond surface where most oxygen exchange occurs. Thus oxygen availability becomes less of a limiting factor in the amount of fish produced.

Ecological Research Aids the Fisherman

Broadly defined, ecology is the study of the relationship of an organism to its environment. An environment, of course, is the sum total of the chemical, physical, and biological factors that surround the organism.

For a fish, this translates into such practical aspects as the oxygen content, temperature, and depth of the water in which the fish lives, and the food species and predators that impact on its existence. In fact, humans, through activities such as fishing or creating reservoirs, are notable components of a fish's environment. Understanding the ecological processes of natural systems is a key to successful conservation and management of fishery resources.

The National Fish Health Research Laboratory at Leetown, West Virginia, strives to assure a healthy future for the nation's fishery resources.



Photo: H. Monte Stuckey, Fish and Wildlife Service

Exotic Species

The introduction of exotic or non-native species graphically illustrates the impact of man on aquatic systems. Some species, such as the European brown trout, were introduced into this country and have provided additional recreational opportunities to the fishing public. Other species, such as the walking catfish, may have impacted adversely on the more desirable native species in certain localities.

Governmental agencies have planned and executed some successful introductions, such as the striped bass on the Pacific Coast which created a new sport fishery. Often, though, introductions are made by kind-hearted souls who dump excess tropical or bait fishes into nearby water bodies, rather than disposing of them in a more terminal manner.

A recent survey in Florida discovered 49 species of exotic fishes with 18 of these having breeding populations. Six of these species—the blue tilapia, spotted tilapia, tilapia mozambique, walking catfish, oscar, and black acara—have expanded their populations in the past decade. Nationwide, 84 exotic species have been found, and 39 of these have breeding populations.

Potentially adverse effects of misguided or inadvertent introductions are not limited to direct impacts on valuable sport fishes through competition for food and space; indirect effects, such as the introduction of exotic fish diseases, remain a real threat. Research is underway to define both beneficial and detrimental effects of introducing exotic or non-native fishes.

Great Lakes Fisheries

The sea lamprey appearance in the Great Lakes is a classic example of the devastation an accidental introduction can incur on valuable

fisheries. Sea lampreys entered the lakes from the Atlantic Coast via the opening of a shipping canal. The serpentine-like sea lampreys use their suction-type mouths to attach themselves to other fishes. With their rasping teeth, the lampreys pierce their victim's skin and feed on its body fluids, thereby weakening the unwilling host.

Research has concentrated on discovering ways to reduce the population of lampreys in the Great Lakes. A recent breakthrough was the finding that sexually mature lampreys release substances that attract other lampreys. This suggests that the substances could be isolated, identified, and applied to spawning waters to attract and concentrate mature lampreys where they could be easily eradicated.

There are some encouraging trends regarding Great Lakes fisheries. In many parts of the lakes, valuable fish

populations, such as the lake trout, whitefish, and chubs, are larger and more stable than they were 10 years ago. Fishery management tactics supported by research results are believed to be significant factors in these improved conditions. Computer models that synthesize biological data and fishery catch statistics now are used to recommend total allowable catches of certain species.

Environmental Factors in the Pacific Northwest

The Pacific Northwest is another region of the country that has experienced severe fishery resource problems. Here research concentrates on defining environmental factors

Special chambers are required to maintain fish in studies of the effects of chemicals on their metabolism and physiology.



that limit the distribution and abundance of fish populations, particularly the five species of salmon.

Investigations are underway to ascertain the effects of river discharge, time of day, light intensity, water temperature, turbidity, and tides on the out-migration of juvenile salmon. Preliminary results indicate that river discharge is a major influence on the timing of out-migration for chinook and chum salmon.

Other research studies in the Northwest are concerned with increasing the survival in the wild of hatchery-reared salmon. This would benefit both the resource and the fisherman.

Although the construction of dams alters the flow of rivers and thereby modifies the total aquatic environment, the creation of reservoirs behind the dams generally offers a readily available recreational fishing opportunity. Fishing in a reservoir, particularly in the initial years following impoundment, can be very productive partly because of the underwater habitat and nutrients supplied by inundated brush and trees. Research aims at maintaining and enhancing this fishing productivity by providing a firm basis for management decisions. Investigations show that the timing and extent of water drawdowns in reservoirs can be critical to the maintenance of desirable species and the continuation of good fishing.

Environmental Contaminants

In her classic work, *Silent Spring*, Rachael Carson alerted the world to the insidious aspects of environmental contaminants. Research on aquatic contaminants is essential, not just because of their direct impact on fishes, but also because aquatic organisms can give early warnings that something is drastically wrong in a system before the effects are noted in organisms higher in the food chain.

It is tempting to speak about contaminants in hushed tones because of some experiences to date. Mercury contamination has terminated more than one sport fishery. Part of a northern river actually caught fire from the presence of volatile substances. Signs formerly posted along the Potomac River in the nation's capital warned passersby to avoid contact by themselves or their pets with the water. Recreational fishermen were told of the dangers from kepone in the James River in Virginia.

Fortunately, the overall situation appears to be improving. Fishes now are found in the Potomac River at Washington, DC, where before a virtual aquatic wasteland existed. Fish populations in Lake Erie have shown a remarkable recovery and DDT and mercury residues in Great Lakes fishes, with some minor exceptions, have dropped below tolerance levels allowed by regulatory agencies. Such news is gratifying, but much research remains to be done on what contaminants are present in the environment, what effects these have on the fishery resources and the aquatic system, and what can be done to mitigate the negative impacts.

So, the next time you find yourself with rod and reel in hand on a beautiful stretch of waterway, you may wish to contemplate in that undisturbed solitude the multitude of research investigations that support the fishery resources of this nation. However, when you battle and land that prize fish, just enjoy the moment—that's what it's all about.

James E. Weaver is a Research Fishery Biologist with the Division of Fishery Ecology Research, U.S. Fish and Wildlife Service, Washington, DC. Prior to assuming his present duties in 1979, he was associated with Texas Parks and Wildlife Department as Director of Finfish Programs. He received his undergraduate education in zoology and master's degree in fisheries at Louisiana State University before obtaining the doctoral degree in marine science at the University of Virginia in 1975.

Portland Returns to its Waterfront

by Douglas W. Bridges

Portland, Oregon, owes its beginning to its rivers and the first clipper ships that made their way upstream to carry grain and lumber out to the rest of the world. Ideally located at the confluence of the Willamette and Columbia rivers, the city first developed along the waterfront, using the riverway to transport people and goods.

But flooding was a problem at times and a seawall eventually was built for protection. This shut off the city from its riverway. Soon it began to suffer from turning its back on its greatest asset, its water resource. Behind the seawall a freeway was built, reinforcing the separation between city and river.

Today things have changed. Portland has reclaimed its river and moved on to renew its downtown core. Once again ships tie up at a designated terminal. What had become unused waterfront has been converted into the mile-long Water-

front Park, office and retail space, and housing units.

Crucial to this reclamation is the Willamette River Greenway Plan. This plan not only guides public development and improvements, it ensures that any private development along the river will provide access to the river for scenic enjoyment and recreational use. As housing is developed along the river, a continual pedestrian bicycle-way must be provided as part of the permit system.

Obviously, this plan met with some opposition, but most citizens approved of it and private development saw its value. The desirability of access to the waterway finally broke the seawall.

The Catalyst

Waterfront Park, now 1 mile (1.6 kilometers) long, provides access from the downtown core and serves as a setting for major events such as

the Rose Festival, Neighbor Fair, and Art Quake. It not only has provided the community with a valuable recreational resource, but has stimulated the private development of several major office complexes, a major hotel, and additional commercial space.

The park was designed as a catalyst for rejuvenating the area between the waterfront and the retail core. Its success is evident in the construction and rehabilitation efforts now underway in areas adjacent to the park.

Portland General Electric made an early commitment to the area by constructing Willamette Center, a \$56 million headquarters complex located along Front Avenue featuring glass enclosed skybridges connecting three buildings overlooking Waterfront

Portland's Waterfront Park has helped revitalize the city's downtown core.



Photo: Jim Lemkin

Park. Adjacent to Willamette Center, Marathon Development is building a new \$16 million office complex. A number of historic preservation projects accompany these commercial efforts.

Downtown Revitalization

Portland's central retail area has experienced a major revitalization. The downtown environment had degenerated: streets were clogged with traffic, public transportation into the downtown area was inadequate, parking was scarce, and air quality problems existed. Consequently, retail stores, restaurants, and entertainment enterprises sought the suburbs.

The Downtown Waterfront Urban Renewal Plan was adopted in 1975 to provide an attractive environment for stores, offices, restaurants, theaters, and housing, and has stimulated investment from the private sector in the downtown. To solve the correlative problems of traffic congestion and air quality, the city in conjunction with the Tri-Metropolitan Transit Authority, created a transit mall running along 22 blocks in the heart of the retail core. Free bus service now runs throughout downtown and new garages anchor activity from east and west. Ground-floor shops and restaurants in the parking structure provide space for new retail activity.

A low-interest loan program assists in the restoration and preservation of buildings in Portland's two historic districts. As downtown housing has emerged as a major planning focus, still other projects are under consideration. In the area adjacent to the civic auditorium, Forecourt Plaza provides restaurants, movie houses, and office and retail space. A convention center is being weighed and plans for a public plaza are underway.

Confidence in the downtown's future has returned. Portland's Water-



Photo: G. Bruce Forster

front Park, adjacent to this core area, is a major development in the city's program to revitalize its downtown.

Waterfront Park

The initial phase of Waterfront Park, which has just been completed between Burnside and Morrison bridges, provides a setting for redevelopment activities. Here open grass meadows host major community events. The waterfront walkway was reconstructed, adding seating areas, new lighting, and open railings to replace some of the solid seawall panels.

Skidmore Plaza, near the Burnside Bridge, is a major new attraction of the park. Here a stage with a stainless steel sculpture backdrop dominates a large brick plaza designed for music, dance performances, and special events. A heavy timber pier projects from the plaza over the river, with a floating dock for water-level contact.

A promenade with new lighting and seating tops the seawall in Waterfront Park.

Near the Battleship Oregon mast-site, ornamental landscaping sets off a raised brick platform. Existing memorials depict the story of the historic battleship.

To complement the waterfront park design, Front Avenue has been reconstructed into a tree-lined boulevard with brick-paved crosswalks and cast-iron street lights that retain the area's historic flavor.

Plans for South Waterfront

Future development activities in Waterfront Park will focus on the area between the Hawthorne and Markham bridges. They will be implemented through the South Waterfront Development Project, supported by citizens' groups and the city of Portland.



Portland's greenway along the Willamette River continues north to the St. John's Bridge area.

provided by the city attracts private investment, which contributes to the economic growth of the city.

A 100-200-unit housing site will follow in mid-1981, and final stages of development will include an additional 400 units of housing and 700,000 square feet (63,000 square meters) of additional office space. The possibilities include public access to the river's edge by pedestrian paths and bikeways, beach areas, a boat marina for pleasure craft, with temporary tie-up dock facilities for downtown visitors and permanent slips for residents. The ability of the project to provide revenue to the city for future maintenance of the waterfront park area also is being analyzed. The south downtown waterfront presents potential developers with a unique mixture of opportunities.

St. John's Waterfront Concept

Farther north, the St. John's Waterfront Concept hopes to complement recent improvements undertaken by the city to upgrade the adjoining businesses and residential neighborhood. The city sought and received a \$9 million federal Urban Renewal Development Action grant from the Department of Housing and Urban Development to develop the area. The grant makes it possible to provide major streets, utilities, public paths, and a greenway along the river. Housing, a 250-boat marina, and other amenities will be designed, constructed, and financed by the private sector. Located along the banks of the Willamette River between the St. John's Bridge and the Burlington Northern Railroad, the development will link the existing residential neighborhood with the

Photo: G. Bruce Forster

To prepare the site for development, the South Waterfront Development Program calls for city investment in excess of \$16 million for the park, utility and street improvements, dredging of the marina, and construction of a protective breakwater. Of the 73 acres (29.2 hectares) in this south waterfront, approximately 25 (10 hectares) will be available for private development, with many

parcels offered through long-term leases with the city.

The first phase of the 15-year project includes construction of streets and marina, completion of open-space improvements including the terraced river bank, and private construction of the 150,000- to 180,000-square-foot (13,500- to 16,200-square-meter) waterfront, commercial center, and marina slips. The framework

waterfront, thus recapturing the community's traditional river life orientation.

A variety of housing types will be constructed for both owners and renters. Calling for approximately 630 housing units, the plan will offer most residents views of the river and the west hills. The plan will employ passive solar heating in site and unit design to maximize energy efficiency.

The St. John's Waterfront will be an active people place. A public greenway will run along the entire waterfront, linking Cathedral Park to the marina. The mile-long (1.6 kilometer) pathway will incorporate observation and resting points and will meet with pedestrian paths extending through the project from present residential areas. The public space will offer opportunities for picnicking, jogging, and observing water activities. In addition, restaurants may be located at the northern end of the greenway near Cathedral Park.

In earlier days, this area was one of the city's most attractive marine centers with a thriving shipbuilding industry. St. John's Waterfront Concept will reflect this maritime heritage.

Funding Strategies

The funding approach used in the Portland system involved many sources. Federal funds were utilized. Neighborhood rehabilitation and special improvement projects were funded primarily through the federal

housing and community development (HCD) block grants. Portland received almost \$25 million in HCD block grants during the first 3 years of the program. These funds were used to improve public facilities and for property acquisition, project operations census, and loans to property owners for rehabilitation work. At the present time, the city council has designated 24 neighborhoods as eligible for HCD funding.

City bonds sales have been another source of revenue. In the urban renewal area around the downtown waterfront, state law and the city charter allow payment of project costs from the increased property taxes that will result from the project. This generally is accomplished through the sale of urban renewal and redevelopment bonds, which are paid off later with increased tax money. In July 1976, the city sold \$10 million of urban renewal and development bonds to assist in financing the waterfront project. Proceeds from this bond sale were used to cover the development costs of Waterfront Park, to assist in financing historic district projects, to acquire sites for the Morrison East parking garage, and to help acquire a site for a proposed transportation center. In May 1978, the city sold an additional \$15 million worth of urban renewal and redevelopment bonds for future waterfront development, historic preservation projects, and rehabilitation loans. Two revenue bond sales

for \$4.5 million and \$5.5 million are financing construction of two parking garages on Morrison Street.

Portland's return to its waterfront has spurred the revitalization of its entire downtown core. It has stimulated private investments and attracted additional funding. In 1979 Portland was designated an "All American City." It truly has become a vital, livable city with a "heart" that pumps life into what once was a degenerating city. Today, because of its waterfront revitalization, Portland is a city with a future.

Douglas W. Bridges is currently Director of Parks, Forestry, and Green Acres for the State of New Jersey. He was formerly Superintendent of Parks and Recreation for the city of Portland, Oregon. Innovative in creative funding and park development, Bridges presently is developing a river renaissance program for the state of New Jersey.

Outlook for Recreational Boating

by Michael G. Sciulla

With increasing energy costs and near double-digit inflation, recreational boating clearly faces significant changes over the coming years. There will be changes in the kinds of boats and boating, the places where boating occurs, the transportation methods used to get to boating sites, and the kinds of boating facilities and services expected by the public.

These changes will have a profound impact on managers of recreational boating facilities. Managers will find themselves challenged by more people with more equipment seeking more facilities and services from what most assuredly will be tighter budgets.

In general, people are taking more vacations closer to home. Driving long distances or "touring" seems to be going the way of the 5,000-pound (2,250-kilogram) luxury car.

Smaller Boats Being Used Closer to Home

The same is true of recreational boating. Instead of hauling a boat from one part of the country to another visiting a variety of locations, the boating public is choosing a favorite locale, leaving their craft and trailer at one spot, then returning on weekends with a smaller, more fuel-efficient car. In many cases this is done not only to save the fuel penalty of trailering a boat, but also because many of today's smaller cars lack the power to haul anything but the lightest loads. The number of new boat trailer sales has decreased since 1973.

With over 70 percent of our population now living in metropolitan areas, and fuel costs inhibiting discretionary travel, the use of waters near metropolitan areas is rising rapidly. This trend should continue. More boat owners are realizing that they don't have to travel hundreds of miles to enjoy their sport. Oftentimes, a

small nearby lake or a reservoir does nicely.

According to the most recent statistics, 82 percent of the 11.6 million recreation boats plying U.S. waters are small craft, 18 feet (5.4 meters) and under. Although the number of boats has increased at an average of approximately 300,000 per year over the past 10 years, most experts expect this rate to slow and new boat sales to flatten out for some time.

Participation in boating may rise, however, as less expensive forms of boating gain popularity. Predictions anticipate a shift to smaller boats, and from power to sail.

Shifting to Sail

A shift from power to sail is occurring because sailboat outboard and auxiliary engines are more fuel efficient, and because sailboats generally are less expensive than motorboats. Also, more Americans want to participate actively in their sport. New sales figures for sailboats bear out this point: 58,050 sailboats were sold in 1977; by 1980, sales had risen to 73,000.

The size of sailboats also may change. The price of a sailboat substantially increases when berths and cooking facilities are added. This normally begins at about the 20-foot (6-meter) range. We probably can expect an increased number of smaller engine-less or low-powered day sailors. This will occur because purchase costs are relatively low, because many sportspersons want to be physically challenged by their recreation, and because these boats are light and can be more readily trailered by today's smaller cars.

Motorboat Trends

New motorboats continue to outsell sail by a margin of four to one even though sales have dropped precipitously from a high of 448,000 before

the Arab oil embargo and fuel price hikes of 1973, to a low of 322,000 in 1979. Although this is a striking drop, it may simply indicate that boaters are not trading their old boat for a new one every 2nd or 3rd year. None of the state boating administrators surveyed for this report indicated that there had been a drop in boating activities.

In fact, a good example of the public's continued interest in motorboating was the response to the Department of Energy's (DOE) attempt to ban weekend motorboating in the early spring of 1980. DOE proposed a federal regulation requiring the states to prepare standby plans to curb fuel consumption in the event of a national energy shortfall. Motorboating was the only recreation singled out for federal attention, probably because it was such a visible target. When DOE suggested that the states consider a weekend ban on motorboating, boaters reacted with a vengeance. In public hearings across the country, boaters spoke out against the proposal. More than 35,000 letters were sent to DOE in opposition. Scores of Congressmen, Senators, and state legislators were enlisted in the fight. Within 2 months, the plan was quietly withdrawn.

Impacts of the Energy Crisis

To meet the energy challenges, engine and boat manufacturers are making significant strides in producing more fuel-efficient, lightweight craft. Only time will tell whether the boating public's honeymoon with the internal combustion engine is over. Some boating experts expect to see a more rapid development of the electrical engine.

One clear shift in motorboating has been noted: there is considerably less on-the-water cruising, probably because of boaters' attempts to cut

fuel usage. Many boating administrators report a decrease in aimless sightseeing. Boating activity now appears to be more purpose-oriented. Boaters are using the shortest route to get to their destination. They're planning ahead, reaching a beautiful spot, cutting their engine, and watching the world go by.

In addition, many larger boats 24 feet (7.2 meters) or more are spending more time sitting in a slip or tied to a pier. They are being used as second or vacation homes, and they are beginning to serve as focal points around which people socialize.

New Craft

Besides the changes in sail and motorboat usage, a number of new craft are hitting the waves. Two recent imports from Europe, inflatables and sailboards, have shown enormous increases in sales and use. Both are inexpensive alternatives to traditional boating. The increasing popularity of jet skis, catamarans, canoes, and kayaks are other examples of how people can get on the water and enjoy it in a relatively inexpensive manner.

These activities, however, appear to involve significantly more safety risks than the normal outboard boat and motor. Responsible authorities should be aware of these trends in new craft as they plan their safety efforts.

As the enthusiasm for cruising and

trailing dampens, the need for more boat storage facilities—be it water slip or dry dock—is bound to increase. In 1979, the Department of Commerce noted the need for another 125,000 slips just for boats under 26 feet (7.8 meters). Many boaters around the country report that it often takes years to get an available slip.

Legislative Boost

Organized recreational boating had a banner year in 1980. Not only was the DOE's weekend motorboating ban vanquished, but the Boat Owners Association of the United States (BOAT/US), the National Association of State Boating Law Administrators, the National Marine Manufacturers Association, and the National Boating Federation joined together and succeeded in convincing Congress and the President to tackle boating's current and future needs.

Signed into law on October 14, 1980, the Recreational Boating Safety and Facilities Improvement Act provides that the proceeds of the 4¢ per gallon (3.8 liter) federal tax that the boating public pays on the fuel it uses be placed in a trust fund exclusively for boating safety, education, enforcement, and facilities improvement efforts. With an annual authorization of \$20 million, the fund should go a long way toward meeting boating's current and future needs.

The trends we foresee in boating activity in the coming years must be

viewed in the larger demographic context and in terms of what is happening generally to leisure activities in the United States. As Americans enjoy more leisure time each year, they increasingly will be looking for ways to escape the pressures of urban existence. Boating can be an answer. Also, the post-war babies are now entering the prime boat buying market. Their huge numbers alone augur well for boating's future.

For many, recreational boating involves a sense of freedom, of aligning and oftentimes pitting oneself against nature and the elements. Boating provides a wide variety of relaxing activities in sharp contrast to daily existence. For some people it is an escape, for others an opportunity to socialize.

In conclusion, the future of boating looks bright. Unless another major energy crisis occurs, the boating public, in our view, will continue to adapt successfully.

Michael G. Sciulla is Director of Public Affairs for the Boat Owners Association of the United States (BOAT/US), headquartered in Alexandria, Virginia.

Management Strategies at Fire Island

by the National Seashore Staff

Fire Island National Seashore was born amid a swirl of controversy just a little over 15 years ago. At that time Robert Moses, the powerful head of the New York State park system, proposed a paved road running the length of Fire Island to "stabilize" the island in case of hurricane and to let motorists drive along the island for "enjoyment."

Reaction from residents and other users of Fire Island was immediate and negative. Perceiving the road as the harbinger of Rockaway-type

Sand dunes and beach grass lie undisturbed in Fire Island National Seashore due to aggressive management strategies.

development, which would destroy the island as they had known and loved it, they turned to the federal government for a solution. The result was Public Law 88-587, creating Fire Island National Seashore:

for the purpose of conserving and preserving for the use of future generations certain relatively unspoiled and undeveloped beaches, dunes, and other natural features... which possess high values to the Nation as examples of unspoiled areas of great natural beauty in close proximity to large concentrations of urban population.

That initial controversy was a portent of things to come. From the first uniformed National Park Service ranger to set foot on Fire Island, to the most recent arrival, the managers of the national seashore have had to contend with a number of problems, some unique to a water-based site, and many unknown to "traditional" Park Service management in older established parks.

Monitoring and Acquiring Land

Land acquisition was one of the first tasks the new seashore staff approached, and a monumental task it was. The island contained literally thousands of separately owned tracts, some a fraction of an acre, others



Photo Courtesy of Fire Island National Seashore

comprising several acres that stretched from bay to ocean. Many tracts fell within the 17 private communities, which the enabling legislation declared exempt from federal purchase except under certain conditions (detailed below). However, all of the tracts had to be drawn in on master aerial photos of the approximately 21 miles (33.6 kilometers) of the island lying within the national seashore boundaries.

Those tracts that lay outside the communities were slated for purchase by the Park Service. In the process the seashore managers learned a great deal through trial and error. Once purchased, some smaller houses unsuitable for resale were burned, an act that left scars on the landscape and that was resented by former owners. Today all structures acquired are sold to the highest bidder and then moved. Any not worth selling are quietly and quickly torn down.

Several structures found within the seashore district fell into the category of squatters. In an attempt to be "good guys," the Park Service agreed to let the squatters use the structures for an additional 10 years, after which they were to leave. That decision came back to haunt later managers when the 10 years were up and the squatters decided they didn't want to leave after all. The result was a protracted court case, which the service ultimately won, but which brought considerable adverse publicity along the lines of "Big Brother Takes Little Guys' Homes."

Condemnations

Enabling legislation for the seashore provided that the Secretary of the Interior would approve the zoning regulations for the exempted communities, which lie within the towns

of Islip and Brookhaven. Improvements on lots that violate zoning standards are subject to condemnation and purchase by the government, even if the town in question has issued a zoning variance.

For several years the seashore had no funding to support its opposition to zoning variances by purchase. Recently, however, concerned legislators have allotted additional money for this purpose. Within the last 2 years several nonconforming properties within the communities have been purchased.

Obviously such condemnation activities can threaten island homeowners, especially those who do not completely understand what is involved. We have partially alleviated this lack of understanding by publishing a Land Acquisition Plan. We further combat misunderstanding through public involvement sessions in which community members ex-

amine and resolve their zoning problems before bringing them to the attention of the Park Service.

Dune District

Another issue that involves us in monitoring and acquiring land is our recently created dune district. This 40-foot (12-meter) wide strip of land extends back from the base of the natural dune line (or where it would be if human activities had not destroyed it), and runs the length of the seashore. Within the dune district no houses will be built on empty lots nor additions made to existing structures.

The district was created to protect the dunes, which are the only barrier between the ocean and the low-lying flat interior of the barrier island.

To ensure objectivity, the seashore staff did not establish the boundary of the dune district. Instead this was done by Rutgers University under



Fire Island's unique sunken forest offers hours of fascinating exploring.

contract. At the same time, Rutgers scientists began to study the sand movement to try to determine how existing houses were affecting the primary dune line.

Beach Vehicles

No discussion of the problems of a seashore area would be complete without covering beach vehicles. Long before the national seashore was established, a few old cars were brought to the island and left there for seasonal use. But the establishment of the park coincided with the construction of a bridge to the western end of Fire Island. This put the large communities on that end within an easy drive of Long Island for the first time. Both the national seashore and town of Islip managers quickly foresaw potential problems and instituted permits to regulate driving on the beach. Responding to the mandate from the majority of residents and users of the seashore, a succession of federal regulations moved to restrict beach vehicles.

Currently, only year-round Fire Island residents who lived there prior to November 1976 may drive on and off the beach, and then only during the off-season when there is no ferry service. Contractors and other providers of essential services must bring their men, equipment, and materials by freight boat and may drive only in the winter when boat service is unavailable.

To determine accurately the physical impact created by vehicles the National Park Service Cooperative Research Unit at the University of Massachusetts has spent the past 3 years conducting a variety of tests. The results support management's contention that vehicle use does damage and that controls are necessary. We probably will not soon see an end to all driving on the Fire

Island beach, but restrictions will continue to reduce the amount. Meanwhile, we are making every effort to explore alternate means of over-water transportation, and to encourage others to do the same.

Seaplanes

Another increasing problem in recent years has been the use of seaplanes. Many Fire Island summer residents live in the Manhattan area, and several companies offer seaplane service as a faster and easier alternative to the Long Island Railroad. However, the landing area in the Great South Bay is heavily used by small boats, and there have been numerous near-misses between boats and planes. Further problems of noise, "buzzing," trespassing on private property, and propeller-blown wind and sand prompted residents in many of the communities to ask the national seashore to provide a regulation prohibiting seaplanes from landing close to their shore. This recently was accomplished, and continuing public input suggests that we may need to write an even more restrictive regulation.

Naturally, the seaplane operators and their passengers oppose the regulation. But the key to seashore management efforts has been the insistence that community members meet and determine on a case-by-case basis whether or not seaplanes are acceptable as a means of transportation. This often is done by a pool of property owners or other such publicly-announced forums where seaplane users and nonusers alike can exchange their views. To date, the traditionalists have prevailed and ferries continue to be the preferred means of access to Fire Island.

Because Fire Island is so heavily used (an estimated summer population of 40,000), and because most of that use is by locals, that is, residents

of New York City and Long Island, all management activities of the National Park Service are closely scrutinized. Groups as diverse as property owners, day-trippers, beach buggy enthusiasts, nudists, hikers, campers, boaters, fishermen, hunters, and others all wish to have a say in how the seashore is managed. When they disagree with us, they often do so loudly. But we have made the not-too-original discovery that much of the opposition we meet results from inadequate information or misinformation. The newspapers, radio, and TV stations frequently carry Fire Island stories and these occasionally contain errors of fact or are misleading.

The best strategy we have found to combat this is simply to carry the word to the people ourselves. . . long, loud, frequently, and as soon as possible. The superintendent and other seashore officials seek out meetings with any organization or interest group that desires them. In addition, a designated employee works full-time carrying the seashore's message of philosophies, plans, facilities, and services to the people who use Fire Island. Every day, talks or slide programs are scheduled for service clubs, churches, schools, senior citizen's homes, institutions for the handicapped, boy and girl Scouts, special interest groups and clubs, and others. The result is that when people understand and are informed about our efforts to manage Fire Island National Seashore, most agree with us.

Pacific Power and Light Company: A Good Neighbor

by Lee Carothers

Striving to be a good corporate neighbor is a goal of Pacific Power and Light Company. This goal especially pertains to the company's involvement in providing recreational opportunities.

Since the early 1930s, Pacific Power has provided public recreation sites near some of its electric generating projects. There are now 37 such areas in 5 of the 6 states the company serves—Oregon, Washington, California, Idaho, Montana, and Wyoming.

These recreational sites offer something for everyone, whether it's water skiing on a blue mountain lake, catching a prize catfish on the Wyoming plains, or hiking through a wildlife refuge in the middle of a city. In recent years, Pacific Power has expanded its recreation program by providing special facilities for the handicapped, by assisting communities in developing their own recreational areas, and by initiating a land resource management program for the large amounts of company land around generating projects.

First Park Opens

The company's first venture into recreation occurred with the opening of public use areas around Merwin Dam (FERC licensed project No. 935), on the Lewis River in southwestern Washington. This park opened in 1934, 29 years before the Federal Power Commission requested that electric utilities plan such developments where feasible at hydroelectric facilities.

Merwin Park has grown into the largest Pacific Power day-use recreational site, with room to accom-

modate up to 3,000 people for picnicking, swimming, and plenty of other outdoor playground activities.

As additional hydroelectric plants were built along the Lewis River, other parks joined Merwin. Today, there are nine Pacific Power parks on the river behind Merwin, Yale (FERC licensed project No. 2071), and Swift (FERC licensed project No. 2111) dams, offering more than 200 campsites.

These parks lie in a heavily forested area fringing reservoirs perfect for water skiers and fishermen alike. They also offer a majestic view of Mount St. Helens, which recently became an active volcano, totally devastating an area north of the Lewis River parks.

Lying within 10-15 miles (16-24 kilometers) of an active volcano has placed special restrictions on the Lewis River parks since mid-May.



Pacific Power recycles used electric cable spools into playground equipment for many of the company parks.

These parks fell within the "red zone" after the largest eruption on May 18, and remained closed until the end of July, when the two parks farthest from the mountain reopened for restricted, day-use only. Continued full public use of the nine Lewis River areas in the future is now uncertain, depending on recommendations of the state, the scientific community studying the volcano, and, of course, the mountain.

Wide Variety of Park Facilities

Aside from the Lewis River sites, Pacific Power also has a cluster of heavily used recreational areas in southern Oregon and northern California along the North Umpqua, Rogue, and Klamath rivers. Additional recreational areas are located in the Alpine-like Wallowa Mountains of northeastern Oregon, and along the Swan River in northern Montana and the White Salmon River in southern Washington.

Although Pacific Power is not required to develop public use areas around steam-electric plants, the company has chosen to do so at its Jim Bridger plant near Rock Springs, Wyoming and Dave Johnston plant near Casper. Both day-use parks offer fishing, swimming, and picnicking facilities.

Cooperative Efforts

The company has worked with local and federal government agencies in further developing recreational facilities for the public. In 1976, for example, Pacific Power cooperated with the Forest Service to develop a trail and viewing area for Toketee Falls, a scenic spot on the North Umpqua River that previously was almost impossible to reach. Pacific Power provided the supervision and materials necessary to build a wooden platform on the steep rock cliff overlooking the falls, while the Forest

Service provided the manpower.

Another joint effort involved the Forest Service, Bureau of Land Management, state of Oregon, Corps of Engineers, Boise-Cascade Corporation, and Pacific Power. These parties worked together in 1974 to build a spur trail from the popular North Cascade Trail to a Corps of Engineer's reservoir several miles away.

Link River Trail

The most recent cooperative venture undertaken by the company has been the Link River Nature Trail and Small Animal Refuge in the heart of Klamath Falls, Oregon. The Link River Trail lies on Pacific Power property adjacent to a small hydroelectric project (FERC licensed project No. 2082) that has served the Klamath Basin since 1921.

In the early 1970s Pacific Power began developing the 1½-mile (2.4-kilometer) trail, which has long been a popular spot for wildlife observers, anglers, joggers, and others. In 1976, it was designated as part of the National Trails System by the Department of the Interior.

The trail, which runs along the riverbank, is located in a unique little wilderness area totally within the city limits. Because of the rich abundance of wildlife present, the area was designated a bird sanctuary and small animal refuge in 1970.

Merwin Park, located on the reservoir behind Pacific Power and Light's Merwin Dam on the Lewis River, provides picnic facilities for up to 3,000 people.

Up to 108 bird species have been seen in the vicinity of the trail at various times of the year. About 23 species of mammals and a number of reptiles and amphibians also share the river locality, as does a diversity of plant life.

Because the nature trail is a popular educational experience for school children, the Klamath Basin Nature Society produced a self-guiding tour booklet for the trail. It includes a map, illustrations that can be colored, and checklists of animals, birds, and plants that thrive along the river. Pacific Power handles the printing of these booklets, which then are distributed by the nature society. The company and the society also work together in organizing guided tours of the Link River area.

Waterfowl viewing blinds were added to the area in 1972, with the assistance of students at Oregon Institute of Technology in Klamath Falls. The students designed and built two structures, with advice and materials contributed by Pacific Power.



Photo Pacific Power and Light Company



Photo Courtesy of the Klamath Falls, Oregon, Herald and News

Specially designed fishing access pads allow wheelchair-bound persons to get right to the edge of the Link River in Klamath Falls, Oregon.

Areas Made Accessible to Handicapped Visitors

While designing and refining these recreational areas, the company built in special additions for the handicapped population. Several recent improvements at the Link River facility were specifically added to make the park more accessible to these people.

The parking lot was paved so that a wheelchair or a person with walking impairments would have a smooth, hard surface to move on. An asphalt trail with a low-sloping grade also was added to connect the parking lot with four specially designed fishing pads.

These small asphalt pads with low railings enable handicapped visitors to go right to the river's edge to try their luck at an assortment of fish, including lake trout, rainbow trout, catfish, perch, crappie, mullet, carp, bass, and chubs.

When planning these special facilities, the company held meetings with handicapped people in the Klamath Falls community. They advised Pacific Power on the types of additions that would best meet their needs.

Helping the Community

Not only do community members assist Pacific Power in planning recreational areas, but the company makes it a policy to assist local communities in developing their own

parks and recreation facilities. Incorporating the "if we can help, we will" philosophy, Pacific Power employees look for ways in which the company can share its technical expertise and help the people develop areas they can be proud of.

One such project recently was completed in Creswell, a small community south of Eugene, Oregon. The city received a parcel of land in conjunction with the construction of Interstate 5 in the area. Citizens wanted to develop it into a park, but lacked the technical experience to undertake such a large project.

So, Pacific Power was invited to help. The company's Recreation Department helped the community set up a schedule for park completion and donated a sign to identify the park.

Managing Land for Fullest Use

Aside from developing the recreation potential of the large amounts of land Pacific Power owns around generating projects, the company also meets its responsibility to care for this land. It strives to create a positive balance among forest products, wildlife, recreation, and aesthetics.

In the early 1970s Pacific Power launched a timber management program in forested lands along its Lewis River and Klamath River properties. Guided by professional forester consultants, the program involves selec-

tively thinning the heavy stands of timber to open up the forest and allow sun to reach seedlings and small undergrowth.

Selective harvesting also removes timber that would eventually fall and rot. The timber harvested on Pacific Power's lands provides a resource needed in the forest products industry.

Good Neighbor Philosophy

Recreational facilities of every type—giving special attention to the handicapped citizens, working with the local communities, offering responsible land management—are all part of Pacific Power's "good corporate neighbor" philosophy.

Lee Carothers is Recreation Facilities Director for Pacific Power and Light Company in Portland, Oregon.

TVA Lends Recreation a Hand

By George M. Humphrey, Robert A. Marker, and Richard S. Austin

Efforts of the Tennessee Valley Authority (TVA) to provide recreational opportunities on its reservoir areas are as old as the agency itself. President Roosevelt, speaking at ceremonies marking the completion of TVA's first dam, Norris, encouraged active steps to build recreational facilities and opportunities into reservoir planning. As an extensive reservoir system developed along the Tennessee Valley, it spearheaded a sweeping change in the life-style of the region.

Designed from the start as multipurpose lakes, the reservoirs revolutionized economic, social, and cultural patterns. Transportation and marketing systems were expanded and changed, floods were brought under control, and electricity came into wide use. At the same time, forest fires were controlled, and the ridges, coves, and hollows were replanted with trees. Fish and wildlife

were brought back and waterfowl were encouraged. All this enhanced an already magnificent area with vast potential for commerce and industry—and recreation.

Reservoirs

Since its inception, TVA has taken a partnership approach in capitalizing on the tremendous recreation potential afforded by its reservoir system. In cooperation with the National Park Service and the Civilian Conservation Corps, TVA built several demonstration parks and a boat dock, and operated them for awhile to show the recreation development possibilities of new lakes. At some of its major projects, TVA had to provide housing for its construction forces. The design and construction of many such housing facilities were planned so that they could be converted to recreation use. These converted facilities made up the initial

operating base for what are now three state parks and three thriving commercial resorts.

Although TVA's initial role was one of demonstrating the value of recreation on reservoirs, its major role has since evolved into one of supporting state and local governments in their efforts to provide water-based recreation opportunities.

TVA has stimulated the development of recreation facilities on its reservoir system by transferring, selling, and leasing lands for recreation to state and local governments. Approximately 500 sites representing some 40,000 acres (16,000 hectares) now lie in the hands of other agencies. In recent years, TVA has often

White-water canoe competitors test the Ocoee River below Ocoee Dam No. 2, in the southwest corner of Tennessee, as a potential site for national kayak events.



Photo: Courtesy of TVA

provided technical planning assistance as part of its process of turning lands over to state and local governments. This assistance has included conceptual site plans, cost and scheduling of site development, operation and maintenance plans, and programming for optimum recreation use.

In several instances during recent years, TVA has cooperated with other agencies to physically establish or improve their recreation facilities. Several years ago, a bass club informed us that the north shore of Fort Loudoun Lake had no boat ramps that were usable during the winter months when the lake is drawn down. Working with the Knox County Recreation Department, we identified three existing ramps, on land TVA had transferred to the county, that could feasibly be extended to accommodate fishermen during the winter months. TVA provided funds for the material required, while the county recreation department provided the manpower and equipment. The county continues to operate these improved ramps as part of its park system.

Similar cooperative improvements are now underway at launching facilities on Fontana Lake in North Carolina, Pickwick Lake in northwest Alabama, and Cherokee Lake in Tennessee.

The cooperative or partnership approach has often worked in the opposite direction also. Some 10 years ago, TVA initiated a program to develop recreation facilities at selected reservoir sites to help meet needs for outdoor recreation opportunities oriented towards reservoirs. Approximately 90 sites have been provided. Local agencies have helped TVA in developing many of these recreation areas. In fact, local participation has accounted for an estimated 15 percent of total capital costs at TVA recreation areas.

Streams

TVA's latest effort in providing water-oriented recreation opportunities has been on streams and rivers within the valley. Stream recreation is one of the fastest growing areas of outdoor recreation. Other stream-related uses, such as fishing, waterfowl hunting, and rafting, are expected to double this demand.

TVA has identified 40 streams and rivers in the valley that possess diversified recreational opportunities complementary to those available on TVA reservoirs. Only 5 of the 40 streams contain public accesses and these 5 have only 14 developed access points, presently providing ingress and egress to just 70 stream miles (112 kilometers). The state of Tennessee has identified 11 state scenic streams but, because of funding restrictions, has been able to acquire access to only a few. Other valley states have similar problems or have not established stream access programs.

A goal of TVA's stream access project is to acquire and develop some 250 sites at selected points across the valley by 1990. These sites would provide legal public access to over 1,800 miles (2,880 kilometers) of valley streams and rivers. This project demonstrates a regional streams access system that is cooperative and comprehensive. Public stream access is provided economically and efficiently through coordinated acquisition, development, and operation by appropriate federal, state, and local agencies.

An example of this approach is our effort with the Commonwealth of Virginia and county governments on the Clinch River in southwest Virginia. To date, six sites have been acquired for public access to the river. In some cases where the local county owned the land along the

river, the TVA has supplied materials and labor for site development through the Young Adult Conservation Corps. In other cases, TVA has purchased tracts of land, and through a letter of agreement, the Commonwealth of Virginia has developed the land while the counties have agreed to operate and maintain the access area.

Summary

TVA's approach to providing public access on both streams and reservoirs has minimized the cost to any one agency while it has worked to meet local and regional needs. Cooperative efforts are essential. They provide the opportunity to develop active support for particular projects and to identify conflicts early. They enable a government entity to avoid the full burden of spiraling costs and limited dollars for developing and managing public access to water. They help us to work together and to avoid duplication. TVA has demonstrated the value of cooperative agreements in the past and is convinced that they will grow more valuable in the future.

George M. Humphrey is Project Leader for TVA's Scenic Streams Project. Robert A. Marker is a Recreation Planner for TVA's Reservoir Recreation Project. Richard S. Austin is Projects Manager for TVA's Streams, Trails, and Natural Heritage Projects.

Recreational Offerings of Pennsylvania Power and Light

by Richard E. Carey

In 1926, Pennsylvania Power and Light Company (PPL) completed construction of Lake Wallenpaupack, a 13-mile (20.8-kilometer)-long lake nestled among the Pocono Mountains in northern Pennsylvania. The lake, then the largest in the state, was built to store water for the electric utility's nearby hydroelectric generating plant.

PPL incorporated recreation facilities in the original design of Lake Wallenpaupack long before the Federal Energy Regulatory Commission required electric utilities to develop recreation resources at all major hydroelectric plants. The lake and surrounding lands, all open to the public, have delighted fishermen, boaters, swimmers, hikers, hunters, campers, water skiers, and picnickers for more than half a century.

With this early start, PPL has extensive experience in providing for public use of its lands. Since the 1960s, the company has greatly expanded its public recreation program, with the development of recreation areas at its other hydroelectric facility, and with innovative park and recreation complexes at two steam electric stations.

PPL has a strong sense of responsibility to the public that is reflected in these recreation facilities and other public use areas throughout its 10,000-square-mile (26,000-square-kilometer) service area in northcentral Pennsylvania. The Allentown utility provides electric service to such diverse areas as the Appalachian Mountain regions of central Pennsylvania, the farmlands of Lancaster County, the industrial and agricultural areas of the Susquehanna River and Lehigh River valleys, and the rural, vacation home, and resort areas of the Poconos. Moreover, the recreation resources and facilities PPL offers are as different as the million customers PPL serves.



Photo: Courtesy of PPL

Lake Wallenpaupack

Lake Wallenpaupack remains PPL's most popular recreation area, attracting more than half a million visitors each year. Although the output of the Wallenpaupack hydroelectric plant today is only a small part of PPL's total generated electricity, the lake has become the economic backbone of both Pike and Wayne counties. Since the lake was built, resorts and other tourist businesses have sprung up around the lake, making the area a major recreation and tourist center of the East.

PPL maintains four recreation areas near the 5,700-acre (2,280-hectare) lake. Each area features facilities for camping, picnicking, and boat launching. A primitive camping area on a separate shore serves the many private camping and scouting groups that canoe in the lake and use the surrounding lands for outdoor education.

The company leases land to a local township, which manages it as a public swimming beach. Another site is leased to the Pennsylvania Fish Commission for a boat launching area, and several private marinas provide lake access as well as full service for boaters. The company issues permits to adjacent property owners on the lake who wish to put in private docks.

Scenic overlooks, a 60-acre (24-hectare) wildlife refuge, and 380

A young couple enjoys a sunset on the shoreline of Lake Wallenpaupack in the Pocono Mountains.

acres (152 hectares) of natural areas are available to the public near the lake. The natural areas include 5 miles (8 kilometers) of trails for hiking, crosscountry skiing, and nature enjoyment. Snowmobiling is also permitted in some areas.

Lake Aldred

In the southern portion of PPL's service area, an 8-mile (12.8-kilometer) long impoundment of the lower Susquehanna River, called Lake Aldred, stores water for PPL's Holtwood hydroelectric plant. This lake and its surrounding 5,000 acres (2,000 hectares) of woodland provide the setting for another major recreation complex.

The facilities developed by PPL include boat launching areas, 2 campgrounds, several picturesque overlooks and picnic groves, 2 nature trails, and 15 miles (24 kilometers) of hiking trails, of which 4 miles (6.4 kilometers) have been designated a national recreation trail. Hunting and fishing are also popular at this site.

In this area, PPL protects several features of botanical, geologic, historical, and cultural significance. Near the upper end of the lake, a large rock that displays examples of Indian carvings, has recently been in-

cluded in the National Register of Historic Places. The Lock 12 historical area at Lake Aldred includes a well-preserved canal lock, a restored lime kiln, and the remains of a water-powered sawmill—all relics of the 19th-century canal era.

Here PPL also maintains the Holtwood Arboretum and 800 acres (320 hectares) of natural areas, including a 40-acre (16-hectare) wildflower preserve. There's even an Indian

artifacts museum run by the York County Conservation Society at the recreation area.

Two New Facilities

While basic facilities for public use are now required by the Federal Energy Regulatory Commission at all major hydroelectric facilities, they are not mandated at other electric generating plants. However, PPL provides land and facilities for public use

at all of its generating stations.

Two major park and recreation complexes—Montour Preserve near the Montour Steam Electric Station and Susquehanna Riverlands near the Susquehanna Steam Electric Station—offer a new dimension by operating as nature and outdoor education centers in addition to providing traditional recreation facilities.

Montour Preserve

Montour Preserve is located near Danville in Montour County. In the center of the preserve lies the 165-acre (66-hectare) Lake Chillisquaque, developed by PPL to provide an emergency supply of cooling water for its coal-fired Montour plant a few miles to the south.

A number of nature programs, dealing with such topics as bluebirds, reptiles, fishing, boating safety, vegetable gardening, winter wilderness backpacking and camping, and aquatic life, are conducted throughout the year under the direction of the preserve's naturalist. In addition to the general public, college, high school, and elementary school classes use the land and facilities regularly for various science and environmental studies. A highlight of the year is Maple Sugar Day, when thousands of children and adults get a first-hand look at how maple syrup and candy are made in the sugarbush, which is operated for educational purposes.

The 966-acre (386.4-hectare) preserve also accommodates such solitary pastimes as fishing, sailing, observing wildlife from the blind at the preserve's refuge area, digging in the fossil pit, and hiking along its many nature trails. In the winter, it also offers ice fishing and cross-country skiing.

Sailing is one of many adventures offered at Montour Preserve's Lake Chillisquaque.



Photo Courtesy of PPL

The preserve visitors' center doubles as the site for educational programs and as a nature museum, with specimens of birds of prey, fossils, fish, and waterfowl on display.

Susquehanna Riverlands

Susquehanna Riverlands was built in conjunction with the Susquehanna nuclear plant, now being constructed by PPL and Allegheny Electric Cooperative, Inc. The recreation area and nature preserve lie along the Susquehanna River in the northern part of the state, near Berwick in Luzerne County.

The 1,200-acre (480-hectare) recreation area, which opened this year, includes 800 acres (320 hectares) of conservation land that is open to hunting, hiking, and fishing. This area includes the Council Cup Overlook, which tops a 700-foot (210-meter) cliff and affords a panoramic view of the river valley.

A canal, which operated in the mid-19th century, offers pleasant canoeing. A walking and bicycling trail extends on both sides of the canal along the old towpath. Picnic pavilions, a volleyball area, a ballpark, and ice skating pond offer more recreation opportunities. The 30-acre (12-hectare) lake also is open for fishing and boating.

The Pennsylvania Fish Commission annually stocks a wide variety of fish at PPL's recreation areas. The utility has embarked on a comprehensive fish management program, in consultation with the fish commission, to improve fishing at Lake Chillisquaque in Montour Preserve, and at the lake in Susquehanna Riverlands.

With cooling towers from PPL's Susquehanna Steam Electric Station in the background, visitors relax and fish at the Susquehanna Riverlands' 30-acre (12-hectare) lake.

As at Montour Preserve, a full range of recreation and educational programs are directed by the staff naturalist at the riverlands.

Other Opportunities

In addition to these four major recreation areas, PPL also provides public access for boating and fishing near its other three steam electric stations. These power plants are all located along major rivers. Along at least 50 miles (80 kilometers) of recreation rivers and streams, company land is open to the public.

Hiking, nature enjoyment, and other outdoor pastimes are even permitted on most of the utility's undeveloped land. More than 20,000 acres (8,000 hectares) of this underdeveloped land is open to the public for hunting in cooperation with the Pennsylvania Game Commission.

In addition to recreation, other resource conservation programs provide for wildlife habitat improvement, rural area protection, agriculture, and forestry on PPL lands.

All of these opportunities stem from PPL's multiple-use policy for its lands. The multiple-use policy reflects the utility's philosophy that it has a major stake in the region it serves. The company has always responded to social and environmental needs; its land policy exemplifies this attitude.

PPL also feels that prudent management of its land near power plants helps to mitigate any adverse impact or intrusion into the neighboring communities. The company believes in making the best possible use of all the resources it controls—part of PPL's commitment to resource conservation.

Richard E. Carey is Supervisor of Land Management for the Pennsylvania Power and Light Company, located in Allentown.



Photo: Courtesy of PPL

Delaware's Water-Recreation Tourism

by Susan M. Laporte

The importance of marine recreation in Delaware's economy cannot be underestimated. Spending associated with marine recreation yields a myriad of business receipts and tax revenues. Further impacting the economy are the jobs this recreational demand generates.

Delaware is fortunate to have more than 250 miles (400 kilometers) of saltwater shoreline fringing the Delaware River and Bay, the Atlantic Ocean, and three inland Bays. This shoreline, with ocean waves, white sandy beaches, sand dunes, rich inland marshes, and bays, contains an ideal combination of physical features for seashore recreation. Biologically, Delaware's waters support a wide variety of fish, shellfish, and waterfowl.

Wide Variety of Recreation Opportunities

Recreation activities such as sport fishing, crabbing, clamming, swimming, and hunting occur throughout the tidewater regions of Delaware. May through September is the prime season for marine activities as noted in Delaware's Statewide Comprehensive Outdoor Recreation Plan (SCORP). The state's combination of excellent natural resources and central location that is easily accessible to the Washington, DC/New York City megalopolis results in a wealth of water-based recreation and tourism opportunities for millions of people. Virtually everyone, regardless of age or circumstances, can participate in some form of marine recreation in Delaware.

A study by the U.S. Census Bureau showed that 12.2 million people traveled to Delaware during 1977 with expenditures totaling more than

Virtually everyone can participate in some form of marine recreation in Delaware.



Photo: Delaware's Department of Natural Resources

\$300 million. More than half of these visitors were drawn to Delaware's 24 miles (38.4 kilometers) of Atlantic coastline and cited swimming as their favorite recreational activity.

The state parks are popular with these visitors. In 1979, Cape Henlopen Delaware Seashore and Holts Landing State Parks alone provided recreational opportunities to 75,600 people, more than half of them nonresidents. Swimmers were cited as the most frequent park visitors.

The Seashore

For beach activities, no particular equipment or skills are involved. The cost of such an outing is low, even for the entire family.

A short swim, a stroll on the beach, and sunning may be the extent of recreation many tourists participate in, but thousands of people come to Delaware for extended stays.

These people spend tremendous amounts of money in the state. Travel expenditures at the least include transportation, food, lodging, entertainment, and incidental purchases. Total expenditures vary according to the season; the greatest contributions to Delaware's economy are made during the peak season when lodging costs are higher.

The population of the coastal communities of Rehoboth Beach, Dewey Beach, Lewes, and Fenwick Island begin their seasonal rise around Easter. Weekend volumes begin to build in May; midweek volume, in June. The season is in high gear from July 4 through Labor Day, with virtually no vacancy in the hotels, motels, condominiums, and cottages. This maximum capacity of overnight tourists brings economic success to lodging and restaurant entrepreneurs. The overwhelming volume of day visitors to Delaware's coastal com-

munities yields less income for the hotel/motel owners; however, these recreationists do produce income for the transportation and food businesses.

Boating and fishing are major water-based attractions. The shore is the top area in Delaware for bank, pier, and surf fishing, recreational crabbing, and clamming, while the nearby bay is the first choice for fishing from boats.

Three coastal state parks collected a total of \$227,734 in user fee revenues in 1979. This represents approximately 75 percent of the total revenues collected at all holdings of the Division of Parks and Recreation. Nonresident travelers provided more than half of this income, indicating again the attraction of Delaware's marine environment to tourists.

Shore fishing attracts recreationists to Delaware's oceanfront.



Photo: Pam Palinski, University of Delaware

Inland Bays

The three large, shallow saltwater bays behind the Atlantic dune line in Sussex County are the nurseries and rearing grounds for most species of fin fish and shellfish sought by commercial and sport fishermen, clambers, crabbers, and boaters. The 120 miles (192 kilometers) of shoreline and 31 square miles (80.6 square kilometers) of water surface of the Rehoboth, Indian River, and Little Assawoman bays provide an excellent setting for marine recreation.

The abundance and variety of resources, plus their ready access from any point within the state, place almost unlimited fishing opportunity before all who desire to participate. In this case, opportunity has engendered demand, and so far the demand for recreational fishing has been met almost entirely by private industry.

Individual boat rentals and related equipment and services, charter vessels, and head boat businesses are available to the boater or fisherman. In addition, support industries such as boat and equipment sales, bait and tackle, boat launch and docking facilities, and nearly all of the boat slip capacity in Delaware are privately owned. The only exceptions are the 51 boat ramps and a 250-slip marina, presently under construction, operated by the state. The private sector derives substantial economic benefits from providing these marine goods and services. State revenues from boating activities are generated through boat registration fees, ramp certificates for out-of-state boats, and the state tax on marine fuel.

Sailing activities are extremely popular along the Delaware Coast and in the bays.



Photo: Delaware's Department of Natural Resources.

A 1976 study by the Department of Natural Resources and Environmental Control's Division of Fish and Wildlife estimated that private boaters fished 436,133 person-days; 166,483 person-days of fishing took place on charter vessels and head boats; and about 226,129 person-days were spent fishing from shore and piers. Researchers estimate that an average person spends between \$15 and \$25 for a day of fishing—a valuable economic impact on the state's economy. Despite these figures, the governor's Task Force on Marine Recreation reports the difficulty of placing "a dollar value on the economic benefits associated with the vast marine recreation beneficiaries."

The fall 1980 issue of the *Delaware Conservationist* published results of a summer 1979 roving creel study at Rehoboth and Indian River bays. Division of Fish and Wildlife biologists interviewed 700 recreational

clammers and measured more than 7,000 clams to get an up-to-date picture of the clammer and his or her catch. The findings underlined the importance of clamming as a tourist attraction; nonresidents from 14 states made up 85 percent of the sample.

Hunting

Although hunting is not really associated with marine recreation, the Canadian goose finds food and shelter in Delaware's tidewater region. The Division of Fish and Wildlife reports that geese are the major attractions for out-of-state hunters. License fees collected from nonresident hunters account for 43 percent of the division's license revenues. Furthermore, hunters account for receipts accrued by the food, lodging, and transportation industries.

Streams and Mill Ponds

Not to be neglected are Delaware's

numerous stream and mill ponds, which offer exceptional opportunities for fishing and sheltered canoeing. Delaware's extensive network of streams and some 60 freshwater ponds lace the state. Delaware's SCORP has identified 1,100 linear miles (1,760 kilometers) of perennial streams distributed across the state. It is obvious that marine activities are not limited to seashore areas but that outdoor recreation also can be sought through this extensive stream system.

In conclusion, recreational tourism thrives in Delaware along the seashore, on the inland bays and throughout the streams and mill ponds. This tourism, in turn, helps keep the state healthy economically.

Susan M. Laporte is the Statewide Comprehensive Outdoor Recreation Planner for the Delaware Department of Natural Resources and Environmental Control's Technical and Community Recreation Services Section.

Riding the Crest of the Water Slide Boom

by Robyn Bebbington

Editor's Note: Water slides continue to grow more popular with the public. For the benefit of park and recreation managers who might be interested in adding a water slide, Trends excerpts the following from an article that appeared in the 1980-81 Amusement Rides and Games Buyers' Guide.

In 1980, there were approximately 400 water slide installations operating in the United States, according to Richard Andert, Atlanta based president of the newly formed National Water Slide Association. Andert said the interest in slides is stronger because of the "tremendous heat wave" experienced over large parts of the country during the summer of 1980. He pointed out that the association projects 60-70 new installations for 1981.

In the water slide business since 1976, Andert outlined the basic appeal of slides. The rides accommodate "the tendency of people to go to water, the beach, when seeking recreation," he said. "Here you have a new 'gimmick' that combines water with thrill and surprise elements."

Cost and Capacity

When considering amusement rides that can cost millions of dollars, water slides built for around \$200,000 a flume can be considered relatively inexpensive. Slides have a confirmed low accident rate. Insurance costs average between 2 and 3 percent of cost. Also, "water slides are a lot of fun if they are built properly."

The general price for a half-hour's use, allowing for 6-12 rides, is \$2.50-\$3.00. Although it is difficult to judge the hourly capacity because heavy people ride faster than light people, most flumes are designed to accommodate 75-100 people per hour.

Development of Parks With Water Slides

In 1976, Walt Disney World opened its 5-acre (2-hectare) River Country water-themed park in Orlando. River Country introduced Fiberglas water slides and the matless ride as major attractions, accompanied by an innertube ride down a glazed, concrete "white water rapids" chute, a logboom swing off a platform into a pool, swimming and beach facilities, and other shorter slides. Themed around the Tom

Sawyer waterhole, River Country became so successful, it encouraged other developers.

In 1977, George Millay opened his 8-acre (3.2-hectare) Wet 'n Wild park in Orlando, 10 minutes away from Walt Disney World. The park has a complete range of water activities including four 400-foot-long (120-meter) Fiberglas slides built side by side to

Water slides are a new gimmick that combines water with thrill and surprise elements.



allow for competition among riders; the "Kamikaze," a 60-foot-high (18-meter), 300-foot-long (90 meter) straight chute over an undulating course; and a 17,000-square foot (1,530-square meter) fan-shaped wave pool that produces waves for 12 minutes with 5-minute intervals. New attractions scheduled for the park in 1981 include a 500-foot-long (150-meter) corkscrew Fiberglas slide featuring three revolutions, a figure-eight, a 4-foot (3.6-meter) vertical drop, and 90 feet (27 meters) of tunnel; and a 175-foot-long (52.5-meter) toboggan ride down a series of rollers at 30 miles (48 kilometer) per hour, culminating with the vehicle planing across the pool.

Other parks in Florida built around water slide themes include the American Broadcasting Company's Silver Springs Wild Water park just east of Ocala, designed to represent an old logging town with water slides winding their way in, around, and through live oak trees; and Anheuser Busch's new 22-acre (8.8-hectare) Adventure Island park in Tampa.

Health and Safety Guidelines

In the interest of proper design and function, the Center for Disease Control (CDC), a division of the U.S. Department of Health and Human Services, hired the National Swimming Pool Institute to establish a set of guidelines by which water

slide designers and inspectors can operate. Andert said the CDC was involved because water clarity, the elimination of harmful bacteria algae, and pool chemistry are big issues in the water slide industry. The official purpose of the guidelines is to assist health and safety officers at the state and local levels with the evaluation and approval of the design, construction, and operation of "water slide flumes, including adequate monitoring techniques and procedures to ensure safe operations."

For the guidelines, slides are defined as "recreational devices designed

Proponents of mats claim the polyurethane and vinyl pads make for a safer and more pleasurable ride.



to provide a descending ride into a splash down pool at the base of the slide. Low friction on the slide bed or flume is achieved in all designs by providing flowing water film. A typical pool may consist of one or more flumes, an entry pool, a splash pool, a pump reservoir, and water treatment and pumping facilities."

Problems

One manufacturer points out that there are a lot of bad water slides in use. Common problems include cracked and weathered concrete surfaces, shallow pools with inadequate cushion for landings, and algae and bacteria buildups.

Most of the companies with proven track records in the design and manufacture of slides are well aware of the problems. They occur when inexperienced entrepreneurs attempt to erect their own slides without professional assistance or knowledge.

Mats

The use of mats is a controversial subject in the water slide industry. Proponents of mats claim the polyurethane and vinyl pads make for a safer and more pleasurable ride. Those who support the matless ride say it allows greater freedom of movement and more creative use of

the flumes, and promotes a more comfortable ride, provided the surfaces of slides are as smooth as possible.

Larry Timbes, an architect with the Myrtle Beach firm of Timbes, Wilund, and Usury, and part-owner of a water slide in Myrtle Beach, prefers mats. Besides offering greater safety and pleasure, the mats, Timbes claims, provide for more consistency in the speed of riders, and intervals between them.

Mike Demetrios, owner of Marine World Africa U.S.A. in Redwood City, California, decided to install a matless slide in his park, designed by Timbes' firm, despite the leanings of Timbes. Demetrios wanted to allow riders to curl up in balls, twist sideways, and assume other positions while riding the slides. Marine World's four flumes were coated with acrylic to enhance smooth surfaces and the illusion of a faster ride.

The Illusion of Speed

To Timbes, "the perfect slide" is one that can withstand maximum abuse and impact, one designed properly with control joints to adjust for seasonal expansion and contraction, and one designed with the illusion of speed, not speed itself, in mind.

"We're not after the small percentage of people who are thrill seekers, nor people who are afraid of their own shadows. We're after family entertainment, an attraction for everyone, from 5 to 77 year-olds."

He believes theming of slides is "very important." Slides built on trestles instill a psychological nervousness in some riders, while slides built into hills of earth provide a feeling of sure-footed security. There are many devices built into slide courses for the purposes of spicing the ride, including waterfalls, water curtains, tunnels, drops, simultaneous curves and drops, corkscrews where riders travel up and around the lip of the flume in a curve and so on.

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