

River Renewal

Restoring Rivers Through Hydropower Dam Relicensing



Rivers, Trails and
Conservation Assistance
Program



National Park
Service

May, 1996



River Renewal

Restoring Rivers Through Hydropower Dam Relicensing

Rivers, Trails and
Conservation Assistance
Program

May, 1996

National Park
Service



American Rivers



ACKNOWLEDGEMENTS

This report has truly been a joint effort of many people. At American Rivers, dedicated interns Paul Souza, Carrie Dean, Zev Ross and Thomas Hicks contributed countless hours of drafting and other assistance. Thanks also go to Angie Tomes at the Rivers, Trails and Conservation Assistance Program (National Park Service) who provided valuable content, editing and oversight.

Numerous individuals also provided us with input and advice on the substantive content of the report. These people include: Pope Barrow, Emily Bateson, Wendy Bley, Lorri Bodi, Richard Bowers, Suzanne Novak, Ken Myers, Shawn Cantrell, Bruce Carpenter, Tom Christopher, Joe Cooley, Peter Donohue, Monica Gross, Dan Haas, Mona Janopaul, Sara Johnson, Cleve Kapala, Chris Kilian, Kenneth Kimball, John Kurland, Ed Laing, Julia Levin, Bob Martini, Rob Masonis, Estyn Mead, Kevin Mendik, George Oliver, Katherine Ransel, Richard Roos-Collins, Steve Rothert, Jeff Sama, Jim Schramm, Mark Sinclair, Dan Sosland, Lorri Sprague, Ronald Stork, James Truchan, David Turin, Dawn Whitehead, Mary McGowen, Ronald Wilson, Steve Franson, Gordon Russell, Lisa McCurdy, and Joe Abrell. Thanks to all of you, as well as to those who I am sure I have failed to recognize.

Margaret Bowman
American Rivers
January, 1996

Cover Photo by Steve Scott.



TABLE OF CONTENTS

- Introduction** 1
 - A. The Impacts of Dams 1
 - B. The Federal Energy Regulatory Commission 2
 - C. The Relicensing Opportunity 3
 - D. The Relicensing Process 4
 - E. Motions of Intervention 5
 - F. The Settlement Alternative 6
 - G. Identifying Mitigation Options 7

- Part I: Mitigation Options** 11
 - I. Recreation Mitigation 11
 - A. Access 11
 - B. Facilities 12
 - C. Recreational Instream Flows 13
 - D. Aesthetics 16
 - II. Conservation Mitigation 16
 - A. Instream Flow 16
 - B. Bypassed Reach Restoration 18
 - C. Reservoir Operation 19
 - D. Fish Passage and Protection 20
 - E. Watershed Land Protection 25
 - F. Erosion Control 25
 - G. Water Quality Protection 27
 - H. Wildlife Habitat Conservation 29
 - I. Cultural Resource Conservation 31
 - III. Additional Mitigation 31
 - A. Trust Funds 31
 - B. Decommissioning Funds 32
 - C. Management Committees 33

- Part II: Mitigation Packages** 37
 - Beaver River** 37
 - I. Background 37



- A. Project Description 37
 - B. Reasons for Settlement 37
 - II. Settlement Terms 38
 - A. The Beaver River Fund and Advisory Council 38
 - B. Recreation 39
 - C. Reservoir Management 40
 - D. Minimum Flows 40
 - E. Fish Passage and Protection 41
 - F. Excluded Provisions 41
 - III. Impacts of Settlement 42
- Black River 43**
 - I. Background 43
 - A. Project Description 43
 - B. Reasons for Settlement 43
 - II. Settlement Terms 44
 - A. Fish Passage and Protection 44
 - B. Minimum Flow 44
 - C. Recreation 44
 - D. Black River Fund 45
 - E. Watertown Project Lands 46
 - F. Watertown Project Fund 46
 - III. Impacts of Settlement 46
- Deerfield River 47**
 - I. Background 47
 - A. Project Description 47
 - B. Reasons for Settlement 47
 - II. Settlement Terms 48
 - A. Minimum Flow 48
 - B. Reservoir Management 49
 - C. Fish Passage 49
 - D. Recreation 50
 - E. Project Lands 51
 - F. Forest and Wildlife Management 51
 - G. Enhancement Fund 51
 - H. Dam Retirement Fund 51
 - III. Impacts of Settlement 52
- Gauley River 53**



- I. Background 53
 - A. Project Description 53
 - B. Reasons for Settlement 53
- II. Settlement Terms 54
 - A. Recreation Facilities 54
 - B. Repair and Review 55
 - C. Construction and Operation of Hydropower Facilities 55
- III. Impacts of Settlement 55
- Manistee, Muskegon and Au Sable Rivers 57**
 - I. Background 57
 - A. Project Description 57
 - B. Reasons for Settlement 58
 - II. Settlement Terms 59
 - A. Dam and Reservoir Operation 59
 - B. Land Management 59
 - C. Fish Passage and Protection 61
 - D. Water Quality 62
 - E. Soil Erosion Control 63
 - F. Historical and Cultural Resources 63
 - G. Dam Removal 63
 - H. Dam Retirement Fund 63
 - I. Coordination Committees 64
 - III. Impacts of Settlement 64
- Pigeon River 66**
 - I. Background 66
 - A. Project Description 66
 - B. Reasons for Settlement 67
 - II. Settlement Terms 67
 - A. Recreation 67
 - B. Minimum Flows 68
 - C. Water Quality 68
 - D. Pigeon River Fund 69
 - E. Cultural Resources 70
 - III. Impacts of Settlement 70
- Saco River 72**
 - I. Background 72
 - A. Project Description 72



B. Reasons for Settlement.....	73
II. Settlement Terms.....	73
A. Cataract Project.....	73
B. Skelton Project.....	74
C. Bar Mills, West Buxton, Bonny Eagle, Hiram and Swans Falls Projects.....	74
III. Impacts of Settlement.....	76
Salmon River	77
I. Background.....	77
A. Project Description.....	77
B. Reasons for Settlement.....	77
II. Settlement Terms.....	78
A. Minimum Flows.....	78
B. Recreation.....	79
C. Aesthetics.....	80
D. Fish Protection.....	80
E. Reservoir Management.....	80
F. Land Management.....	80
G. Water Use Payments.....	80
III. Impacts of Settlement.....	81
Skagit River	82
I. Background.....	82
A. Project Description.....	82
B. Reasons for Settlement.....	83
II. Settlement Terms.....	83
A. Fisheries.....	83
B. Wildlife.....	84
C. Cultural Resources.....	85
D. Recreation and Aesthetics.....	86
E. Erosion Control.....	87
III. Impacts of Settlement.....	87
Conclusion	91
A. Transforming the Relicensing Process.....	91
B. Spreading Settlement Successes.....	91
C. Looking Ahead.....	92

Introduction



Introduction cover photo courtesy of USDA-Soil Conservation Service.



ivers are **the nation's** circulatory system. **They** provide essential nutrients and habitat for thousands of aquatic and terrestrial species, including humans.

They provide extraordinary and much beloved recreational opportunities. Nearly 75,000 dams have been constructed on rivers across the country. Although these dams provide important flood control and electricity benefits, they have obstructed many other beneficial functions of rivers across the country. Today, decades after most of these dams were **built, we are** beginning to understand the ways in which dams have **impaired rivers**. Although the impact of dams has been substantial, a significant amount of the detrimental impacts can be reversed or reduced. The process of relicensing hydropower dams has spawned creative ideas for **river improvements**, as well as negotiations among hydropower companies, natural resource agencies, non-governmental organizations, and individuals to implement these rehabilitation measures. Remarkable river enhancement has resulted.

A. The Impacts of Dams

Dams change the fundamental chemical, physical, and biological processes of river

ecosystems. Dams alter free-flowing river systems by reducing river levels, blocking the downstream flow of nutrients and sediments, changing water temperatures and oxygen levels, and impeding fish and wildlife migration.

Hydropower dams, because of the way they have historically been operated for power generation, have had the greatest negative impact on the ecosystem. By diverting water

from the natural stream bed to the power plant, some dams have **de-watered** stream sections below the dam, leaving aquatic **habitat and boating and fishing opportunities** "high and dry." Other dams operate in a "peaking mode" where the river is retained in a reservoir **and then released** in great volume to generate power **for specific** periods of peak

electricity demand. This typically can upset the riverine ecosystem, disrupt fishing and boating opportunities, and cause bank erosion. Hundreds of thousands of fish are also killed annually when they are drawn into a dam's turbines and struck by the spinning blades. Lastly, public access has often not been available on significant land holdings surrounding the dam.

The 75,000 dams on our nation's rivers include approximately 750 Army Corps of

Potential Impacts of Dams

1. Reduce river levels
2. Alter timing of flows
3. Block rivers
4. Slow rivers
5. Alter water temperature
6. Decrease water oxygen levels
7. Fluctuate reservoir levels
8. Hold back silt, debris and nutrients
9. Turbines cut up fish
10. Prevent public river access

Engineers or Bureau of Reclamation dams, 1,750 dams on land owned by the Bureau of Land Management, 300 dams on Native American lands, 430 dams located in National Wildlife Refuges or the National Park System, and at least 50,000 general purpose dams (Environmental Protection Agency estimates). Thousands of privately-owned hydropower dams are also blocking the nation's rivers. These hydroelectric dams, generally operated by private developers, stockholder-owned utilities, or state or local governments, are primarily regulated by a federal agency called the Federal Energy Regulatory Commission (FERC).

B. The Federal Energy Regulatory Commission

The Federal Energy Regulatory Commission, an independent federal commission in the Department of Energy, has jurisdiction over all hydropower dams not owned by the federal government that either: (1) occupy federal public lands or federal reservations; (2) are located on navigable streams; (3) use surplus water or water power from a federal government dam; or (4) were constructed after August 26, 1935 and are located on a non-navigable stream that affects the interests of interstate or foreign commerce (including providing power to an interstate power grid).

Rivers are owned by the public. As public resources, rivers cannot be owned by private industries. A developer may obtain a license, however, to dam the river for the purpose of hydropower generation. These

About FERC

- Licenses non-federal hydroelectric power facilities
- Issues licenses for construction of new dams
- Relicenses the operation of existing dams
- Presently oversees approximately 1,800 licenses

licenses last 30 to 50 years and typically stipulate how the dams are operated, what minimum water flow levels are required, what forms of fish passage must be installed and, in some cases, how watershed lands are managed.

Well before a license expires, the dam owner must apply to FERC for a new license. The relicensing process allows FERC, state and federal resource agencies, conservation groups, and the general public to reconsider appropriate operations and land management for each project, taking into account current social and scientific knowledge.

In the past, FERC's primary goal had been the promotion of hydro dams as a means to harness a river's power generation potential, often in disregard of the proposed dam's environmental impacts. A 1986 amendment to FERC's operating law (the Federal Power Act), however, required the Commission to take a more balanced approach to dam licensing. The amendment requires FERC, when deciding whether to issue a license, to consider not only the power generation potential of a river, but also to give equal



consideration to energy conservation, protection of fish and wildlife, protection of recreational opportunities, and preservation of general environmental quality.

This "equal consideration" mandate requires FERC to consult with federal, state and local resource agencies, including fish, wildlife, recreation and land management agencies, in order to assess more accurately the impact of a hydro dam on the surrounding environment. In its evaluation of environmental impacts, FERC is obligated to prepare an Environmental Impact Statement (EIS) or Environmental Assessment (EA), investigative reports which assess the environmental consequences of a proposed hydropower project and compare the impacts with those of alternatives to the suggested action.



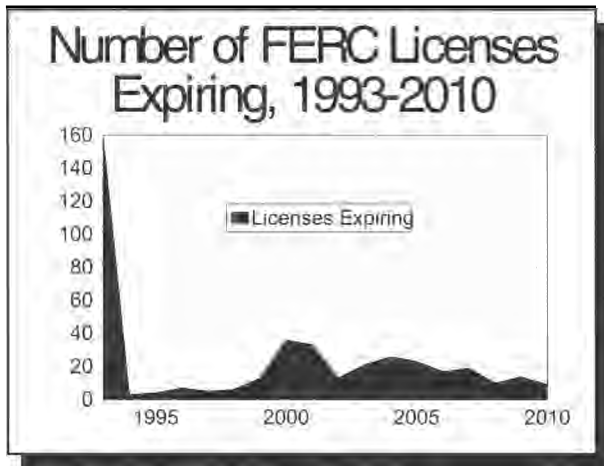
Dam relicensing is an opportunity to improve the health and accessibility of rivers (photo courtesy of Oregon State Department of Parks and Recreation).

C. The Relicensing Opportunity

Dams constructed several decades ago were not built with a concern for protecting the river ecosystem or providing recreational opportunities. With the benefit of current social and scientific knowledge, however, many of the deleterious impacts on rivers caused by hydropower dams can be eliminated or minimized by changes in the operation of the dam. The hydropower dam relicensing process provides an excellent opportunity to modify dam construction and operation and address environmental and recreational problems. Many of the dams licensed in the 1950's or earlier are now, or will be soon, under review by FERC. In 1993, for example, 160 licenses expired, affecting 262 dams on 105 rivers (in the past only a handful a year expired).

Because of the heavy volume of expiring licenses, FERC has yet to complete the class of 1993 dams; only about 51% of the relicensings have been completed. In addition, licenses for 550 more dams are due for relicensing in the next 15 years.

The relicensing process provides an important medium by which public interest issues related to river recreation and conservation can be addressed, as well as a means of ensuring that any chosen modifications, additions, or enhancements are expeditiously implemented. In order to take advantage of the rare opportunity that relicensing presents every 30 to 50 years, one must be familiar with the process of



hydropower project license renewal and the operations of the Federal Energy Regulatory Commission.

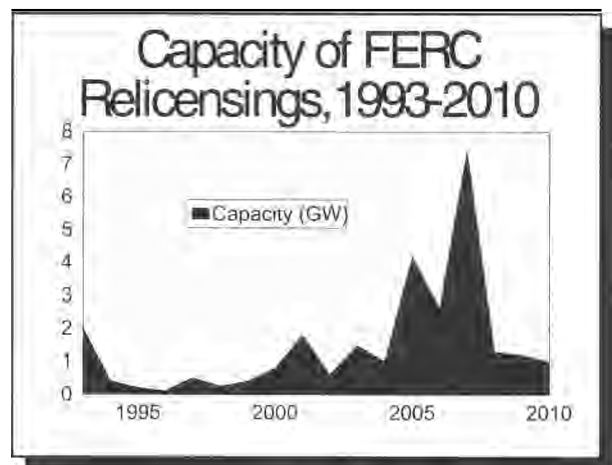
D. The Relicensing Process

Five years prior to license expiration, the licensee must file a notice with FERC stating its intention to seek a new license. FERC will then publish in the *Federal Register* and in local newspapers a statement of the licensee's intent to file. FERC will also inform appropriate state and federal resource agencies. At this time, the licensee will prepare an initial consultation package outlining the project and their relicensing plans, and make records regarding the project's generation, financing, and environmental effects available for public inspection. The licensee must then consult with state and federal resource agencies (e.g., Fish and Wildlife Service, National Park Service, state fish and game departments) regarding the operations needed to protect fish and wildlife and provide recreation enhancements. The applicant will

conduct the necessary studies for the license application, often in consultation with resource agencies.

Two years before the original license expires, the licensee will submit a relicensing application to FERC. FERC, resource agencies, conservation groups and concerned individuals will review the license application and identify any additional studies needed for the application. Resource agencies and the public can submit requests for additional information to FERC. FERC will then review the information requests and determine which requests will be submitted to the applicant. The applicant must then conduct the necessary studies and respond.

Following completion of the additional studies, FERC will publish in the *Federal Register* and local newspapers a notice that the application for license renewal is complete and accepted by FERC for review (termed "ready for environmental analysis"). Resource agencies and intervening bodies can then propose recommended terms and





conditions for the new license, and make any additional comments they may feel are necessary.

For most projects, the environmental review is initiated at this time. There is a trend, however, to establish the scope of the review earlier in the licensing process, often at the time the initial consultation package is released. The environmental review will consist of preparation of an Environmental Assessment (EA) unless the project may have significant environmental impacts. In this case, a more comprehensive Environmental Impact Statement (EIS) may be compiled.

Both environmental reviews examine the impacts of the proposed project, as well as the impacts of alternatives to the project, listing the advantages and disadvantages of each. Based on this analysis, a preferred alternative will be designated. A draft of the EA or EIS will be publicly distributed by FERC, and interested individuals, parties, or resources agencies may submit to FERC their comments on the document. FERC will revise the draft document based on these comments and issue a final report.

Once the EA or EIS has been completed, a hearing may be held by FERC if there are any material or factual questions remaining to be answered. FERC staff will then make its decision on the license renewal. If the license applicant or an intervening party is not pleased with any part of the license decision, they may request a review of the decision by the five FERC commissioners. The Commission can affirm, reverse or

modify FERC staff's decision. If the licensee or intervenor continues to be displeased with FERC's decision, that decision can be appealed to the U.S. Court of Appeals.

E. Motion to Intervene

In addition to providing comments at various stages of the relicensing process, the Federal Power Act allows individuals, public interest groups and other interested parties to provide further input into the process by filing a motion for intervention and becoming a formal party to the proceedings. Because FERC provides a primarily judicial function in deciding whether or not to issue a license and what new terms to impose on a relicensed project, formal, court-like rules govern public participation in the Commission's decision-making process. In order to participate in a relicensing procedure, intervening bodies must become an official party to the Commission's proceeding by filing a motion to intervene. If a person, agency or group does not intervene, they can still file comments on a relicensing, but their comments will be given more consideration if they intervene. More importantly, without intervening, they will not have standing to seek judicial review of the Commission's decision.

A motion to intervene may be submitted to FERC at any period following the filing of the relicensing application. If the motion is filed before the comment date indicated by FERC in the *Federal Register*, the motion will automatically be accepted unless another



Renewing healthy flowing rivers is the goal of many relicensing intervenors (photo by Steve Scott).

party opposes the motion. If the motion is filed after the deadline, FERC has discretion whether to accept or reject the motion, and will accept only with good cause. If an Environmental Impact Statement is prepared for a project, there will also be an opportunity to file a motion of intervention following the release of the draft EIS.

Intervention motions should include an introduction of the individual, agency or group requesting to participate in the proceeding, a statement demonstrating that the intervenor has an interest that will be directly affected by the license renewal, and a statement of position outlining reasons for opposition to the relicensing or desired license terms and conditions. After a group, agency or individual is accepted as an intervenor, they become a party to the proceeding. This means that FERC is obligated to consider and respond to their

comments and evidence presented in their intervention and any subsequent motions or recommendations. If the final decision of the Commission is not satisfactory to the intervenor, they can appeal the decision to court.

Public intervention in FERC relicensing proceedings has been successful at demonstrating the need for conservation and recreation improvements, issues often ignored in the past by FERC. By building upon the conditions achieved and the experience gathered in past relicensing

procedures, public intervenors will hopefully gain more progressive mitigation for the great number of hydro projects to be relicensed in the near future. Now more than ever, the relicensing process presents a golden opportunity to improve the quality of and access to America's rivers.

F. The Settlement Alternative

Rather than endure the long, complicated process of traditional relicensing, in many cases resource agencies and other interested parties have chosen to negotiate directly with the license applicant to develop license terms and conditions that include conservation and recreation enhancements. These settlements, attained outside the FERC process, have generally yielded faster and more creative improvements for rivers than those achieved in traditional relicensings. In addition, mitigation provided for in settlements can



often be implemented with less delay, curtailing further resource degradation.

With a large number of licenses presently before FERC, FERC has welcomed the settlement process as it often allows for more expeditious relicensing. Project licensees often favor the process as well, because the excessive, **expensive studies which** accompany FERC relicensing can sometimes be avoided and licenses are often issued more quickly when a settlement has been achieved. Most importantly, however, settlement agreements establish a framework for long-term cooperation between resource agencies, the public, and project owners. The sometimes adversarial nature of development-conservation relationships is alleviated through the settlement process, as the concerns of all parties can often be equitably addressed.

Settlements can occur at any time in the relicensing process. However, the trend has been to develop settlement agreements before the **environmental review has been** conducted. In this way, FERC can evaluate the proposed settlement terms and conditions as possible alternatives in the EA or EIS. Once a settlement has been successfully negotiated and signed, it is submitted to FERC with the request that all settlement terms and conditions be included as part of the official license. However, because FERC sometimes omits or alters terms of the settlement agreement which are not "conventional" FERC license provisions, many settlement parties have included a clause in the settlement making all settlement

Settlements generally yield faster, more creative improvements for rivers than traditional relicensing

terms legally binding regardless of whether FERC includes them in the license.

G. Identifying Mitigation Options

In both a settlement and a traditional relicensing, intervenors must be prepared to identify all license terms and conditions desired, providing explanations to justify each recommendation. It is essential that intervenors have a clear sense of the mitigation that can be realized in order to stand on equal ground with project owners during the negotiation process. Because settlement agreements are a relatively new medium for negotiation, and because new kinds of mitigation measures are being developed as part of settlements and relicensings, many organizations may be unaware of the types of mitigation that can be achieved. This report provides an overview of the range and types of mitigation that have been attained in recent relicensings, with the intention of educating future participants in the licensing process about the types of enhancements and additions that can be reached through settlements and traditional relicensings.

This report has been organized into two sections. The first is a description of the types of mitigation achieved in past settlements and traditional FERC relicensings. Mitigation categories discussed are: (1) recreation mitigation including access, facilities, instream boating flows, and aesthetics; (2) conservation mitigation, including instream flows, restoration of bypassed reaches, reservoir operation, fish passage and protection, watershed land protection, erosion control, water quality protection, wildlife habitat conservation, and cultural resource protection; and (3) additional mitigation, including trust funds, decommissioning funds, and management committees. For each category, typical mitigation provisions will be briefly outlined, and one or two settlement and/or traditional relicensing examples will be highlighted.

The second section includes summaries of nine settlement agreements from rivers in several areas of the country. A concise description of each river and project area is provided, and the entire settlement package is briefly outlined. This portion of the report is included to acquaint potential participants in a settlement with the characteristics of a broadly developed settlement package that suits the needs of a particular river.

It is our hope that this document will be instrumental in educating those who wish to protect rivers and riparian environments from the damaging effects of hydropower projects, so that future generations of fish, animals, plants, and humans can enjoy the many natural resources which America's rivers provide.

Part I

Mitigation Options



Part I cover photo courtesy of Idaho Department of Fish and Game.

I. Recreation Mitigation

A. Access

In the past, some hydroelectric facilities have restricted or prohibited access to a river through their privately-owned lands, while others have provided considerable public access. The rivers themselves are a public resource, and recent settlements and relicensing decisions have provided improved access for recreational purposes. Basic access ensures that the public can have access to the river across the dam owner's lands as well as portage access around the dam for boats travelling down the river. In addition, some

dam owners have agreed to provide boat ramps and other enhancements to facilitate access to the river and reservoir for recreation. Access enhancements have included restoration or installation of boat, canoe, and kayak launches and take-outs; marked portage trails; parking areas; paved and graded fishing access or fishing trails; canoe chutes for bypassing dams; and ferry services. In many cases, special access facilities for the disabled have been created. Management and upkeep of these access facilities are often supervised by the land proprietor. Because dam owners already profit from the use of the public's rivers, all access to the river must be free.

Example: Black River Settlement (New York)



Relicensing can provide improved river conditions for angling and other recreation (photo by Carla Vlascamp).

A settlement on the Black River in New York State contained a number of access enhancements. Steep limestone banks prevented easy access for boaters to a 200-foot-long rapid in the lower bypass reach of the Watertown Hydroelectric Project. Access to the only sloping riverbank, located at Waterworks Park, was prohibited by a City ordinance. The City of Watertown, owner of the dam, amended the ordinance in March 1994 as a result of the settlement process. A kayak launch and fishing access site will be constructed at the location by December 1996.



Rivers are owned by the public; river access should be provided by dam owners (photo by Rich Bowers).

The existing portage launch/take-out on the reservoir will be moved for convenience, and will be provided with directional signs. A limestone terrace at the bottom of a construction road will be graded to the river's edge to make it easier to launch canoes, and a small current barrier will be placed just upstream of the put-in to provide calmer water for launching boats. The portage take-out will also serve as a hand-carry launch for boaters wishing to access the 3.5 mile long reservoir for fishing and other forms of

recreation. Parking for cartop boat launching and a barrier free fishing access will be constructed near the portage take-out.

Example: Nisqually River Relicensing (Washington)

Tacoma Public Utilities Company (TPU), licensee of the Nisqually Project on the Nisqually River in Washington, has long maintained a "no public access" policy on their lands. In the recent Draft Environmental Impact Statement for the project, FERC recommended that TPU allow whitewater boaters to descend a 300-foot cliff via a rope to the shoreline. This has been proven a reasonable manner of accessing the river, and whitewater boaters are generally satisfied with the recommendation. Take-out locations downriver will be available in the area of a proposed state park.

B. Facilities

Settlements and relicensings can often include provisions that require the installation or renovation of recreational facilities by the dam owner. Such facilities have included picnic areas, restrooms, changing facilities, camping sites, playgrounds, information kiosks, trash receptacles, **skiing and hiking trails**, children's camps, and educational facilities. In most cases, facility maintenance and regulation enforcement are provided by the dam owner.

*Example: Passumpsic River Relicensing
(Vermont)*

In 1994, FERC issued a new license for four hydroelectric projects on the Passumpsic River in Vermont, owned and operated by the Central Vermont Public Service Corporation (CVPSC). The license provided for the addition of several recreational facilities. Picnic and play areas will be constructed in three of the four project areas, some complete with restroom facilities and barrier free access. At the Pierce Mills Dam, two overnight camping areas will be provided for canoeists on weekend excursions down the Passumpsic. In consultation with the Vermont Department of Forests, Parks & Recreation, CVPSC will develop and erect interpretive signboards conveying information about the natural history of the Passumpsic River, the history of each hydropower project, and general knowledge regarding the area's historical architecture. CVPSC has also agreed to develop a Passumpsic River Recreation Guide to be distributed free of charge in local communities. Finally, FERC has required that ten and twenty years following the license renewal, CVPSC should conduct professional recreational use surveys to determine levels of public satisfaction with existing recreational facilities. Additions or enhancements may be implemented based upon the results of the two surveys.

*Example: Skagit River Settlement
(Washington)*

Among other recreational enhancements, a settlement on the Skagit River in Washington has provided for the development of a North Cascades Environmental Learning Center on either Diablo Lake or a site next to the National Park Service Visitor Center. The City of Seattle (dam owner) will build the Learning Center on federal lands, and work cooperatively with the National Park Service in support of operations. The center will have an initial overnight capacity of 40 students and 12 faculty, with the possibility for expansion to a capacity of 60 students and 18 faculty. As part of the City of Seattle's support of the North Cascades Environmental Learning Center, an annual payment of \$20,000 will be paid to the Center to further the development of public knowledge and understanding of the values and issues in wildlife and management in the Project Area and the North Cascades.

C. Recreational Instream Flows

With the growing popularity of river boating, most notably whitewater recreation, hydropower settlements and licenses often include provisions for periodic whitewater flow releases from the dam. Releases are frequently scheduled for anticipated peak recreational periods, and flows can be tailored to the skill levels of particular boaters. It may also be possible for multiple dams on the same river to coordinate whitewater release



Dam relicensing has improved recreational boating opportunities (photo by B. Deane).

times. Ramping flows, in which the amount of water discharged from the dam is raised and lowered in small increments, are favorable as they are less likely to disturb the river's ecosystem and risk harm to downstream persons and wildlife. Release schedules are often made available to the public via recorded phone messages, and warning signs and sirens are usually installed to alert individuals downstream of imminent releases. Flow decisions are usually made to accommodate the needs of both river boaters and fish and wildlife.

***Example: St. Louis River Relicensing
(Minnesota)***

The St. Louis River system is one of the most pristine and well-protected rivers in

Minnesota. Its striking geologic beauty draws visitors from a multi-state region to canoe, kayak, fish and hike along its waters. A beautiful five mile "bypassed" natural river channel is also the site of an annual international kayak competition, as well as the National White Water Center. Both were developed with the assistance of Minnesota Power, the owner of the four-dam St. Louis hydropower project.

The upper two mile portion of the bypassed reach flows through a beautiful gorge 60 to 70 feet across through which

Class II-VI water flows over a gradient of 75 feet per mile. Flow studies in conjunction with local and national boating organizations led to license articles which include a consistent 350 cubic feet per second (cfs) flow during the boating season and four weekends of 1,300 cfs for the international kayak competition training and events.

License articles also include flows of 1,000 cfs for two hours each day to accommodate whitewater boating over class I-II rapids through a scenic segment upstream of the bypass reach. As a result of relicensing, Minnesota Power will also provide 325 cfs in May and 340 cfs in June to the Cloquet River, a major tributary to the St. Louis, which offers excellent peaceful canoeing through mostly forested terrain.

The relicensing also resulted in: (1) the establishment of a toll-free telephone line with flow rate information; (2) new launch sites; (3) 12 to 20 new primitive camp sites; and (4) a spin-off community-led watershed protection project to protect hundreds of miles of riparian lands, including 22,000 acres which Minnesota Power set aside for public acquisition.

**Example: Kern River Relicensing
(California)**

*The Kern River in Southern California offers 83 miles of outstanding whitewater recreation, with class **III, IV, and V** rapids, nine whitewater runs, and one of the highest gradients of any western river. The area is also well known for its natural beauty; the North Fork of the Kern River has been declared a National Wild and Scenic River. Below the Kern River No. 3 Hydroelectric Project, on the Kern's North Fork, whitewater boating opportunities are largely determined by the operation of hydropower facilities, particularly the Fairview Dam. In the past, a lack of reliable flows in the 15 mile dry river stretch between the dam and the powerhouse has prevented the area from reaching its whitewater recreation potential.*

In its Draft Environmental Assessment for the project, FERC recommended that the Southern California Edison Company (SCE), the project licensee, expand its season of whitewater releases through August instead of April (as it stands currently), providing three additional



The aesthetic beauty of rivers can sometimes be restored through relicensing (photo by Stephen Shaluta).

months of whitewater recreation. In addition, FERC recommended that SCE provide optimal recreational flows (determined by whitewater boaters to be 1,050 cfs for the upper portion of the bypassed reach, and 1,400 cfs for the lower portion), which may involve periodic augmentation of natural flows and result in a temporary loss of power generation.



D. Aesthetics

The natural beauty of a riparian landscape, after being altered by the construction of a hydropower dam, can sometimes be partially restored through license terms that provide for aesthetic enhancement. Improvements can include constant river flows, cleared areas with newly exposed scenic views, vegetation additions to screen power generation facilities, and locating new facility structures away from the river itself.

Example: St. Joseph River Relicensing (Michigan)

Indiana Michigan Power Company's (IMPC) dam and powerhouse on the St. Joseph River in Michigan are located beside a well traveled road, creating an unsightly view for the general public. FERC has recommended in its Draft Environmental Assessment that IMPC take appropriate measures to improve the area's aesthetic quality. IMPC has agreed to demolish one of two brick storage buildings located adjacent to the project powerhouse, disposing of the refuse in an environmentally acceptable manner. FERC has also determined that trees and shrubbery could be planted to screen the powerhouse and remaining storage building. In addition, the transformers, circuit breakers, and other major electrical equipment in the substation will be painted green to match the powerhouse roof and lessen the current harsh visual contrast.

Example: Salmon River Settlement (New York)

In a settlement concerning its hydro project on the Salmon River in New York, the Niagara Mohawk Power Company agreed to modify the top of Salmon River Falls with natural ledge material. The addition was made to distribute the flow over the 110 foot falls in a veil formation, producing a more dramatic spectacle. Niagara Mohawk also agreed to plant evergreen trees around selected electrical generation facilities to shroud them from public view and to clear trees in other areas to open up scenic areas. Natural buffer zones were also established along the Salmon River to screen proposed recreational facilities.

II. Conservation Mitigation

A. Instream Flow

Hydropower projects can be separated into two general categories: run-of-river operations and peaking operations. In run-of-river operations, reservoir water levels are not mechanically regulated. Water flows over the dam in proportion to the amount entering the reservoir upstream. Peaking hydropower operations, however, store water behind the dam until it is most economical to release the water and generate electricity (e.g., storing



A key provision in many dam settlements is establishing improved base river flows below the dam (photo by Kenneth I. Brown, Appalachian Mountain Club).

water at night to release during the day). These peaking operations cause downstream stretches to fluctuate between low or no flows and surges of high water. This fluctuation erodes soil and vegetation, and either floods or strands wildlife downstream. In addition, peaking operations alter the natural seasonal flow variations of the river, such as high

spring flows from snow melt, that trigger growth and reproduction cycles in many species.

By establishing minimum and maximum flow requirements, it is possible to return healthy flows of water to reaches of river which previously received reduced flows, and to minimize the damaging effects of peaking hydroelectric operations. Seasonal

minimum and maximum flows can also be established to protect spawning areas or other seasonal habitat needs. It is also possible to convert some dams from peaking to run-of-river generation. In many cases, minimum flow decisions are made to accommodate both fish and wildlife concerns and river recreation.

Example: Salmon River Settlement (New York)

The Salmon River Project in Oswego County, New York, consists of the Bennetts Bridge and Lighthouse Hill powerhouses. As the result of a settlement, a continual base flow was established for the project to form the basis for Atlantic salmon restoration. A comprehensive water budget model was developed by Niagara Mohawk (dam owner), conservation groups, and government resource agencies to establish minimum base flows downstream of the project at 300 cfs from January to April, 200 cfs from May to August, and 350 cfs from September to December. Flows below 450 cfs will be made through a new base flow unit that will be located in the spare bay of the Lighthouse Hill powerhouse. In addition, a Salmon River Flow Management Advisory Team (FMAT), consisting of representatives from state and federal agencies, local interest groups, and Niagara Mohawk, will be established to monitor changing conditions



that may affect river flows. *If deemed necessary, the FMAT will request that FERC consider changes in flows, releases, or other water-related operations.*

Example: Pemigewasset River Relicensing (New Hampshire)

*In its Final Environmental Impact Assessment for the Ayers Island Project on the Pemigewasset River in New Hampshire, FERC recommended a comprehensive instream flow schedule to accommodate power generation, whitewater boating, and fish and wildlife needs. FERC established a minimum base flow of 320 cfs year round. *If in the future, migrating salmon return to the dam area, the minimum flow shall be maintained at 746 cfs from October 15 to May 15. From May 15 to August 31, the difference between minimum**

and maximum flows below the project will be limited to 550 cfs. To prevent rapid water level fluctuations, all discharge changes shall be increased and decreased with 30 minute waits between turbine settings. To accommodate whitewater boating, whitewater flows (minimum 840 cfs) will be provided to coincide with peak boating hours on weekends and holidays from May 1 through August 1. A special whitewater boating release of 1,000 cfs in July and 1,500 cfs in August for 6 hours each (10am-4pm) will also be provided.

B. Bypassed Reach Restoration

In order to generate electricity, many hydropower projects divert almost the entire flow of the river between the dam and the powerhouse away from the riverbed, leaving it completely dry. The water is generally channeled through penstocks (pipes) or diversion canals and released at the base of the powerhouse. The dry "bypassed" reaches of a river can be as short as a few hundred yards, or as long as 15 miles. By bypassing stretches of river, the dam operations not only kill any preexisting aquatic or riparian wildlife, but also destroy the river's continuity as a migration corridor. Through settlement agreements and licensing decisions, flows can be redirected



Dry river beds can be converted to flowing rivers through relicensing (photo by Kenneth Kimball, Appalachian Mountain Club).



into dry river segments, and a healthy riverine ecosystem can be restored.

***Example: Deerfield River Settlement
(Massachusetts and Vermont)***

A settlement agreement involving dams on the Deerfield River in Massachusetts and Vermont provided for the restoration of several reaches of river previously bypassed for power generation purposes. For example, the three-mile Searsburg bypassed reach will now receive a minimum flow of 35 cfs from June 1 through September 30, and 55 cfs from October 1 through May 31. The Harriman bypassed reach, 4.4 miles long, will have guaranteed flows of 70 cfs from October 1 to June 30, and 57 cfs from July 1 through September 30. New England Power Company, the project licensee, has also agreed to submit to FERC, one year following license issuance, a plan proposing means to monitor, report, and verify all minimum flows required in the settlement agreement. The objective in restoring the bypassed stretches is to provide potential for Atlantic salmon spawning on the Deerfield and to develop a year-round cold water fishery.

C. Reservoir Operation

Peaking power hydroelectric operations require reservoir fluctuations, where the level of water in the reservoir behind the dam is lowered for energy production (drawdowns can also be conducted for dam maintenance or flood control purposes). The fluctuation of

reservoir water levels is damaging to a variety of avian and aquatic species. For example, birds such as the loon construct nests in close proximity to the reservoir water line, where significant fluctuation in either direction could flood the nest or strand the incubating mother. Eggs laid in shallow areas by certain fish species are in similar danger. In order to lessen environmental and ecological injury, reservoir fluctuation limitations (both annual and seasonal) are often provided for in settlement agreements and relicensing decisions.

***Example : Beaver River Settlement
(New York)***

In order to protect nesting birds and spawning fish in its reservoirs, the Niagara Mohawk Power Company has agreed in a relicensing settlement to limit reservoir fluctuations at all eight dams in the Beaver River Hydroelectric Project. Three of the Beaver River dams, Moshier, Soft Maple, and Effley, will have maximum daily fluctuations of 1.0 foot from normal maximum headwater elevations between May 1 and June 30. For the remainder of the year, these dams will have a maximum daily fluctuation of 1.5 feet. The Eagle, Elmer, Taylorville, and Belfort dams will adopt a permanent maximum daily fluctuation of 1.0 foot, and the High Falls dam will fluctuate by 1.5 feet at most per day (all from normal maximum headwater elevations). In addition, any dams utilizing flashboards (structures added to the dam to increase its height thereby raising its stored electricity capacity) will not erect or replace

flashboards from May 1 to June 30 to protect further the spawning fish and nesting birds.

Example: Montreal River Relicensing (Wisconsin and Michigan)

In the new license issued to Northern States Power Company (NSP) for its Superior Falls Hydroelectric Project on the Montreal River in Wisconsin and Michigan, FERC ordered NSP to limit fluctuations of its reservoir to 0.5 feet year round. This will prevent NSP from conducting any peaking power operations, but will ensure stable reservoir levels and flows downstream for fish and wildlife. NSP is permitted to exceed these reservoir level restrictions in circumstances beyond their control, such as flood and ice conditions.

D. Fish Passage and Protection

1. Fish Protection: Fish mortality rates in rivers dammed by hydroelectric projects are often high, as migratory and resident fish are wounded or killed after being swept into and through the dam's turbines (this is called entrainment). In order to reduce this damage, fish screens can be constructed at the



Passing through a dam's turbines can be deadly for fish (photo courtesy of Wisconsin Dept. of Natural Resources).

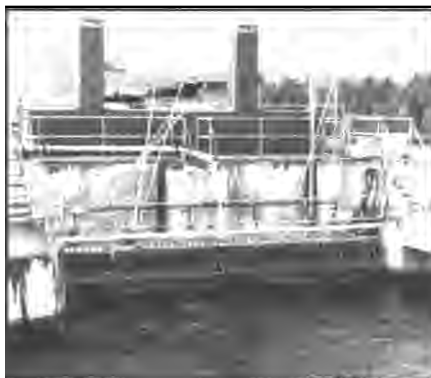
intake area for each turbine. Trashracks (metal grating installed to prevent debris from entering the turbines) can also be used to hold back fish, provided that the bar spacing is sufficiently narrow.

Example: Chippewa Falls Relicensing (Minnesota)

The Chippewa Falls Hydroelectric Project on the Chippewa River in

Minnesota is required by its new FERC license to provide improved fish protection. Northern States Power (NSP), the project licensee, will change the bar spacing on the project's existing trashracks from 4.5 to 1.0 inches in order to reduce turbine entrainment. In the event that the modified trashracks do not effectively reduce fish kills, FERC will

require NSP to take additional measures to reduce entrainment. In addition, NSP will provide monetary compensation to the state for fish killed at the Chippewa Falls project, the amount of which depends upon the effectiveness of installed fish protection devices.



Trashracks like the ones on this dam can sometimes be used to protect fish from the dam's turbines (photo by Steve Massero).

Example: Beaver River Settlement (New York)

In a settlement agreement, Niagara Mohawk Power Company has agreed to replace existing trashracks at its eight dams on the Beaver River in New York with those having one inch, clear bar spacing to help reduce fish entrainment. Niagara Mohawk will have two years (following FERC license acceptance) to replace the trashracks at Moshier and Soft Maple dams, six years to replace the High Falls and Effley trashracks, ten years to replace the Eagle and Taylorville trashracks, and fourteen years to replace trashracks at the Elmer and Belfort dams. In addition, Niagara Mohawk will install a fish screen at the Soft Maple Dam within two years of license renewal to prevent reservoir fish from entering bypassed reaches. The fish screens will have no greater than 1/2 inch space openings, and will be constructed at the upstream end of the Soft Maple diversion tunnel.

2. Fish Passage: Hydroelectric dams also impede both the upstream and downstream movement of many migratory fish species, such as salmon, sturgeon, and shad. These migratory (or anadromous) fish hatch in the upstream reaches of a river, travel downriver to live out their lives in the ocean, and return to the same river years later to reproduce and



Dams block the migration of salmon and other fish (photo courtesy of Boneville Power Administration).

often die. Because dams block both up- and downstream migration for most migrating fish species, it is beneficial for settlements and license agreements to include provisions for the installation of upstream and downstream fish passage facilities on rivers supporting anadromous fish populations. In some circumstances, fish passage may also be appropriate for resident (non-migrating) fish species. Settlements and relicensings have also required the dam owner to hire wildlife biologists to monitor spawning fish populations and evaluate the effectiveness of stocking and/or newly installed fish passage. The best variety of fish passage for a given dam depends largely on the types of fish inhabiting a river, the design of the dam, and the characteristics of the river.



a. Upstream Fish Passage: Numerous upstream fish passage techniques have been developed, including fish ladders, lifts, lock systems, and trap and truck methods. Fish ladders are staircase-like devices, usually off to one side of a dam, through which water is channeled. Some migratory fish species are able to travel up the ladder to arrive at the upstream reaches of a river. However, since fish must physically jump from one tier to the next, the ladders offer effective upstream passage for only strong swimming fish like salmon and trout.

Lifts and locks operate on the same principles as an elevator. With a fish lift, downstream fish are collected in a large container which is then mechanically lifted above the dam and emptied into the reservoir. A fish lock collects fish in an enclosed area. The surface level of the water is then raised to the top of the dam by adding water. When a trap and truck method is used, fish are drawn into a tank with the aid of a pump or a lift and transported by overland vehicles to a release site above the dam.

Like the fish ladder, lift, lock and trap and truck methods are only effective for certain types of fish. Those fish transported by these methods are often injured or stressed as a result. The overcrowding that results from these upstream passage methods increases the incidence of disease. Although many technologies exist for upstream passage, little data exists evaluating the success of these techniques in passing viable numbers of a given fish species.

b. Downstream Fish Passage: Downstream fish passage facilities have historically been considered less of a priority than have upstream facilities, as it was assumed that young fish would simply travel over the falls of a dam or through the turbines. However, declining numbers of anadromous fish have demonstrated that dams must provide improved downstream migration facilities. In many cases, downstream passage is provided through a canal over or around the dam that supplies a steady flow of water around the structure without a precipitous drop in elevation.

Peaking hydroelectric operations pose an obstacle to downstream migration when peak generation times do not coincide with spawning seasons. Fish prepared for rapid downstream currents during spawning season may become disoriented by the lack of water or stagnant reservoir. Under such conditions, it may be possible to arrange for a reservoir drawdown (also called a controlled spill) in order to flush the fish downstream. Barging fish downstream has also been tried experimentally to transport fish around dams and out to the ocean. Barged fish, however, experience increased disease, heightened stress, and decreased homing instincts when they attempt to migrate back upriver later in life.

***Example: Saco River Settlement
(New Hampshire and Maine)***

The Saco River in New Hampshire and Maine houses seven hydropower projects owned by

the Central Maine Power Company (CMP) and by the Swans Falls Corporation. In a settlement agreement exclusively addressing fish passage, provisions were made for a basin-wide fish passage plan designed to restore viable, self-sustaining populations of Atlantic salmon, American shad, and river herring to the Saco River.

Tailored to the individual dams, the settlement outlines the installation of an appropriate combination of lift, lock, and trap and truck systems for upstream fish passage, as well as downstream passage structures. In order to determine the effectiveness of the fish passage systems, the settlement also established a four year assessment cycle. Assessment criteria will be developed by the settlement parties in advance of the assessments, and will address the following factors, among others: spawning escapement, trap and truck capacity and mortality, habitat utilization, size of runs, fallback below one or more dams, rate of increase in populations, and stock origins of runs. The conclusions found in the assessment reports and the final design for upstream fish passage facilities will reflect consensus decisions by all parties, or the discretion of the fisheries agencies, if conclusions cannot be agreed upon.



Barges have been used experimentally to ship young salmon down river (photo courtesy of Boneville Power Administration).

3. Alternatives to Fish Passage and Protection: Many of the fish passage and protection methods described above are expensive to construct and maintain. As a result, dam owners often seek to offer monetary compensation for lost fish in lieu of implementing fish passage or protection measures. This is generally done through the establishment of an entrainment fund, whereby money is dispensed by the owner for fish that have been destroyed by the dam's turbines. Two of the key disadvantages of these funds are that they do not protect against fish mortality, and that they usually do not adequately compensate for the fish killed. In addition, once the level of monetary compensation is agreed on, it is often not updated to accommodate changes in the consumer price market.

Another alternative to fish passage is construction of a fish hatchery by the dam owner from which the river can be restocked with fish. Hatchery fish, however, tend to compete with native populations and introduce disease. Installation of effective fish passage and protection facilities is clearly more effective than monetary or hatchery-based compensation. Nevertheless, in some situations, these alternatives are the only viable option.

Example: Manistee, Muskegon, and Au Sable Rivers Settlement (Michigan)

Parties to a settlement involving dams on the Manistee, Muskegon, and Au Sable Rivers in Michigan determined that whenever possible, fish protection devices should be installed on the rivers' eleven hydropower projects. However, until protection facilities have been constructed, and wherever they are not feasible to install, the licensee (Consumers Power Company) will provide monetary compensation for fish entrainment. Following FERC license renewal, Consumers Power will make annual contributions of \$575,000 (adjusted annually for changes in the Consumer Price Index) to the State of Michigan Habitat Improvement Account for fish losses due to turbine entrainment. The money will be deposited into a fund to be used for fisheries habitat restoration or enhancement, preparing comprehensive river management plans, aquatic studies, fisheries recreation, water quality improvement, and soil erosion control activities. Once fish protection devices are installed, FERC will

reduce the annual contribution based upon the effectiveness of the protection system. Fish protection efficiency will be determined by comparing the results of the pre-application fish entrainment and mortality studies with a single, one-year study of a similar scope performed after the fish protection measures are installed.

Example: Lake Michigan Settlement (Michigan)

A final environmental assessment in Ludington, Michigan for a pumped storage hydropower plant on the eastern shore of Lake Michigan included the establishment of an entrainment fund which will compensate for past fish kills as well as for those fish killed in the future. Between \$5 and \$7 million will be provided by the project owner for past turbine entrainment, and between \$2.5 and \$3 million will be deposited each year in remuneration for the 100 million fish destroyed annually. The money will be placed into a fund overseen by the settlement parties (excluding the project owner) and will be used to study and enhance the basin. A portion of the funds will be used for continued installation of fish protection nets, used only in the warmer months, to keep fish from being entrained in the intake. Hopefully, the netting will reduce destruction of larger fish, thereby reducing the amounts of future compensation fees. Although netting has been shown 80% effective for larger fish, it is useless for smaller fish.

E. Watershed Land Protection

Certain riverbank environments, such as wetland regions and mature forests, support a variety of wildlife and vegetation found in no other surrounding. These riparian corridors can sometimes be protected through direct purchase or a conservation easement, which eliminates any threat of future development or tree-clearing in the location. Conservation easements are created when the current landowner (usually the dam proprietor) agrees to waive all rights to further development by granting or selling the development rights to their lands to the state or a land protection organization. If the property is later sold, the conservation easement will remain in effect.

Example: Salmon River Settlement (New York)

Through a comprehensive land management program for its Salmon River properties, the Niagara Mohawk Power Company will provide to the New York State Department of Environmental Conservation (NYSDEC) the following: permanent easements to all NYSDEC fishing access locations along the Salmon River downstream of Lighthouse Hill Dam; fishing easements along most of Niagara Mohawk's property on the lower Salmon River downstream of Lighthouse Hill Dam; a 200 foot wide conservation easement along the downstream river corridor; and four other easements enabling a trail system to be developed along the entire river corridor. In addition, Niagara Mohawk will sell to

NYSDEC the area south of the Salmon River Reservoir, the area surrounding and including the Salmon River Falls, the existing angler parking areas, and one additional area downstream of Lighthouse Hill Dam.

Example: Penobscot River Relicensing (Maine)

In its Draft Environmental Impact Statement for the West Branch of the Penobscot River in Maine, FERC recommended a 200 foot expansion of project boundaries around all reservoirs of the Ripogenous and Penobscot Mills Hydroelectric Projects. The expansion would include a 200 foot building setback (prohibiting all residential and/or commercial development within the area), and a 100 foot vegetative buffer (preventing clear-cutting and/or vegetation removal in the proposed area). The execution of these measures is expected to preserve the wilderness character of the area for the 130,000 people annually who visit the Penobscot's West Branch for recreation or sightseeing. Riparian corridors, bald eagle habitats, and water quality would also be protected. In addition, the existing conservation easement on the West Branch, located below the Ripogenous Project, would be expanded.

F. Erosion Control

Water discharged from peaking hydropower dams is often released quickly and in large quantities. Consequently, fragile riverbank soils are irreparably eroded. Erosion can be

caused by other activities, such as wave activities in the reservoirs, and clearing of riverside lands. On some rivers, it may be advantageous to negotiate for the establishment of a comprehensive erosion control program. Certain measures can be taken to minimize erosion, such as the planting of specific types of vegetation in areas of designated erosion control to help hold the soil in place.

***Example: Skagit River Settlement
(Washington)***

The City of Seattle, licensee of the Skagit River Hydroelectric Project in Washington, has agreed, as part of a relicensing settlement, to construct greenhouse facilities and institute a plant propagation program to supply plant stock for vegetation transplantation at erosion control sites. An erosion control plan will be developed in order to designate sites in particular need of mitigation, and in addition, the City will provide \$845,000 for erosion control work at these sites over the first nine years following license acceptance. An additional \$500,000 will be allotted for erosion control measures at sites not designated in the erosion control plan, and up to \$99,000 will be designated for erosion control at several high priority trail and campground sites prior to license issuance. A new environmental staff position, dealing primarily with erosion problems, will also be established. Erosion rates and processes will be monitored at sites where there is a large potential for significant slump movement of soils, or where a high rate of erosion is especially undesirable (e.g., osprey

nesting areas). In key locations, vegetation, logs, rock walls, and cribbing will be used to curtail erosion.

***Example: Sturgeon River Relicensing
(Michigan)***

In the license issued to the Upper Peninsula Power Company (UPPCo) for its Prickett Hydroelectric Project on the Sturgeon River in Michigan, FERC limited reservoir fluctuations to 0.3 feet 80% of the time, and 1.0 foot 100% of the time. To prevent erosion of the reservoir and river banks, FERC also



Relicensing conditions can reduce erosion of riparian lands (photo courtesy of American Rivers).

required a five year trial elimination of a 6.5 foot winter reservoir drawdown. UPPCo will monitor the effects of no drawdown on dam operations and flood prevention. Upon reviewing the monitoring results, FERC will determine whether this trial drawdown restriction should become permanent.

G. Water Quality Protection

1. Temperature and Chemical Control: Over half the nation's drinking water originates in river systems. As such, adequate water quality is essential for humans as well as for river and riparian flora and fauna. When a river is dammed, stagnant water in the resulting reservoir becomes stratified. Deeper portions, which receive negligible light penetration, are very cold and oxygen deficient, while surface layers are warmed considerably. Water released from either the top or bottom strata alters natural temperature and chemical conditions downstream. Fish and other species are very sensitive to these temperature and oxygen changes, which often result in fish kills and elimination of native fish populations. Pursuant to the federal Clean Water Act, state environmental agencies can require projects to meet specific water quality standards, including both standards for temperature and dissolved oxygen content and designated uses of the river such as salmon spawning. To ensure compliance with water quality standards, licenses can require water quality monitoring devices to be installed at the dam owner's expense.

Example: Manistee, Muskegon, and Au Sable River Settlement (Michigan)

Consumers Power Company, owner of several hydroelectric projects on the Manistee, Muskegon, and Au Sable Rivers in Michigan, has agreed to fund \$1.75 million for the study, planning, design, and construction of water quality protection systems, specifically dissolved oxygen and temperature enhancement measures. Water quality monitoring systems will be installed at each of the projects to evaluate present dissolved oxygen and temperature levels and determine whether or not they are in compliance with previously established water quality limits. An evaluation report will be submitted by Consumers Power to specified resource agencies that includes an analysis of non-compliance projects and outlines whether appropriate water quality levels could be obtained by either: 1) increasing the volume of cooler water passing through the plant turbines during the summer months; or 2) engineering operational measures to increase downstream dissolved oxygen concentrations. Measures recommended by the resource agencies will be submitted to FERC for approval before contracting is begun.

If after two years following the installation of monitoring equipment or three years from license issuance (whichever is earliest), Consumers Power is not in compliance with any water quality limit, the Michigan Department of Natural Resources will assess the following liquidated damages: \$1,500 per month per temperature exceedence per project; and \$100 per day per dissolved

oxygen non-compliance per project. In order to ensure the protection of public health and safety, and the natural resources of the State of Michigan, any party to the settlement may petition the Michigan Water Resources Commission every fifth year to modify the established dissolved oxygen and/or temperature limits.

***Example: Escanaba River Relicensing
(Michigan)***

The license issued to Mead Corporation for the operation of its three dams on the Escanaba River in Michigan establishes flow requirements to ensure adequate water temperatures below the dams to accommodate native fish and wildlife. For most of the year, Mead must operate all three dams in a run-of-river mode. From June 1 to September 15, if the previous day's water temperature is 26° C or higher, Mead must release impounded water up to 400 cfs from the furthest upstream dam.

2. Contaminated Sediments: Contaminants released into a river by industrial or other operations are blocked by hydroelectric dams as they travel downstream, settling to the bottom of reservoirs and often resulting in a build-up of layers of polluted sediment. During reservoir drawdowns or dam repair activities, the sediments may become agitated, resuspending harmful contaminants. The release of sediments containing concentrated levels of contaminants poses risks to fish and other wildlife which ingest the toxins, and in turn to humans as they consume the fish. In contaminated river

systems, therefore, water releases and dam repairs may need to be minimized and carefully regulated so as to reduce the amount of toxic sediment resuspension.

***Example: Pigeon River Settlement
(North Carolina)***

A paper mill upstream of the Walters Hydroelectric Project on the Pigeon River in North Carolina has contaminated the river sediments with dioxin and furans. Carolina Power Company, the dam owner, has agreed to monitor concentrations of contaminants in edible filets of predatory and bottom feeding fish in the project reservoir. Sampling and analysis of fish toxin levels will continue until otherwise ordered by FERC or until the State of North Carolina rescinds its current fish consumption advisory. The water level in the project reservoir will not be reduced below an elevation of 2,232 feet in order to minimize sediment disturbance. Limited draw-downs will be allowed, but are not to exceed a specified period of time. In addition, proposed releases to restore water to a twelve-mile bypassed river reach below the dam will be postponed until water quality in the impoundment has improved sufficiently. At the end of the fourth year of the project's new license, Carolina Power has agreed to file a report with FERC recommending what further action, if any, should be taken to minimize the disturbance of contaminated sediments in the reservoir. After consultation with state and federal agencies, FERC may require Carolina Power to take appropriate actions to lessen dioxin contamination in the project reservoir.



Conservation of habitat for eagles and other wildlife can be important license conditions (photo by Robert Hunter).

H. Wildlife Habitat Conservation

Under certain circumstances, it is desirable to seek protection for animal and fish species that are especially threatened by a river's hydropower activity. Such provisions have included conservation of existing beaver flows or elk wintering ranges, and the construction of nesting structures for wood ducks, osprey, and loons. It may also be in the best interest of the threatened animals to restrict human activity within their determined home ranges. For example, a bald eagle management plan has been implemented for the Au Sable River in Michigan, which limits activity in designated protected zones around all critical roosts, perching sites, and nest trees.

Example: St. Joseph River Relicensing (Michigan)

In its Draft Environmental Assessment for the St. Joseph River Hydroelectric Project in Michigan, FERC recommended implementing a wildlife management plan to protect threatened, endangered and sensitive wildlife within the project area. Land owned by the Indiana Michigan Power Company (IMPC), the project licensee, has been identified as one of the region's few potential habitats for the Indiana bat, a federally-listed endangered species. The bats use defoliated barks of trees and cracks in tree trunks to raise their young and to roost during the daylight hours. FERC has recommended that IMPC protect Indiana bat habitat. Therefore, IMPC may not remove or cut dead, dying, or injured trees with exfoliating bark within 100 feet of riverine reaches. In addition, IMPC will be prohibited from tree trimming during the Indiana bat's maternity period, from May 1 through August 31.

Example: Missouri-Madison River Settlement (Montana)

A settlement regarding the Missouri-Madison Hydroelectric Project in Montana included a comprehensive strategy for the management and conservation of wildlife and wildlife habitat. A wildlife protection, mitigation, and enhancement plan will be developed to

*evaluate the impacts of project operation on wetlands, upland habitat, state-designated rare plant species, and wildlife (in particular, wildlife **which is valuable for recreational/commercial purposes**, and state-designated rare species). Montana Power Company (MPC), the project licensee, will consult with the Fish and Wildlife Service and state fish and wildlife agencies regarding the project's potential adverse impacts, and recommended measures will be developed to minimize the severity of these impacts. Every three years following license renewal, a wildlife monitoring plan will be implemented to determine the effectiveness of procedures taken by the wildlife protection, mitigation and enhancement plan.*

The Montana Power Company will fund a new wildlife biologist position, whose duties will



Relicensing conditions can protect important cultural resources located near a dam, such as this petroglyph (photo by Chris Brown).

include the coordination and implementation of a bald eagle management plan, protection and enhancement of riparian environments around the Hegben Reservoir, completion of time series studies of certain macrophytes, waterfowl, and other migrant birds, and the securing of federal and private funds for wildlife protection and enhancement. ~~In~~ addition, the Montana Power Company will designate \$140,000 for the enhancement of waterfowl and migrant bird species in the Hegben Reservoir and Upper Missouri River areas. Key riparian habitat zones will be protected, breeding pair bond habitat will be developed near the reservoir, and shallow marsh areas will be constructed for breeding shorebirds.

The Missouri-Madison River settlement also includes special provisions for the protection of birds of prey. Transmission powerlines in the project area constitute an environmental hazard for raptors, as the large birds are frequently electrocuted when using the powerlines for a perch or nest site. The problem, which occurs because the raptors are large enough to touch simultaneously two energized wires, is easily corrected with design modifications including proper pole configuration, spacing of conductors, and grounding practices. The project owner has agreed to consult with the Fish and Wildlife Service, the Montana Department of Fish, Wildlife and Parks, and various

land management agencies, and then erect new powerlines which effectively minimize raptor electrocution.

From April 15 through August 15, during osprey nesting season, MPC will be prohibited from trimming, moving, knocking down, or otherwise manipulating any osprey nest. In the case of an emergency, where a nest presents an imminent danger to life, property (e.g., in a forest fire), or electrical service, MPC must file an individual nest plan with the Fish and Wildlife Service before taking action to relocate the nest. During non-nesting season, from August 16 to April 14, osprey nests can be removed from energized poles and transferred to alternate nesting locations. Fabricated perch sites and nesting platforms will also be constructed, and nesting deterrents will be installed for powerline poles.

I. Cultural Resource Conservation

On some occasions, hydropower projects have been constructed on or near archaeologically or historically significant lands (i.e., Native American tribal territory, colonial building sites). Under these circumstances, it may be necessary to include license terms for the preservation and enhancement of cultural resources.

*Example: Skagit River Settlement
(Washington)*

The City of Seattle, Washington, owner of the Skagit River Hydroelectric Project, has

agreed to develop an archaeological resources plan in conjunction with the National Park Service, the Washington State Historic Preservation Officer, the Upper Skagit Tribe, the Sauk-Suiattle Tribe, and the Swinomish Indian Tribal Community. An estimated \$1,465,000 will be made available by the City for archaeological measures, programs, and field evaluations, as well as \$70,000 for the purpose of inventorying, evaluating, and documenting the historic resources of the project area. In addition, \$282,000 will be provided to document, protect, mitigate, and interpret the area's historic building and engineering resources.

Historic structure reports will be prepared by the City of Seattle for two historic buildings for which either major rehabilitation or demolition are being considered. Historic landscape reports will also be conducted for grounds in Newhalem and the Ladder Creek Gardens, which may be rehabilitated in the near future. In addition, the City will develop several program measures and products to enhance the understanding and appreciation of the historic resources of the area, including a self-guided walking tour and brochure.

III. Additional Mitigation

A. Trust Funds

An additional outcome of recent settlements is the establishment of a trust fund, in which the

dam owner deposits money into a fund (either through a lump sum or an annual deposit) for selected purposes. Projects to be financed by the fund often include public education, ecosystem restoration or protection, facility maintenance, improvement of access and recreational areas, purchase of watershed lands, wildlife and fish protection, and mitigation of impacts not anticipated at the time of licensing. Funds can be managed and dispensed by an advisory council with members such as state or city conservation departments, conservation and recreation groups, various other settlement signatories, and the dam owner.

*Example: Black River Settlement
(New York)*

Within 60 days of FERC's issuance of a license for its dam on the Black River, the City of Watertown, New York, established the Black River Fund to finance projects and facilities that conserve and enhance the river's fish, plant, and wildlife resources. An initial sum of \$30,000 was deposited, and three years after the completion of a new 10.8 megawatt powerplant, \$10,000 will be added to the Fund annually. The City Manager, the Commissioner of the NYSDEC, and the Executive Director of New York Rivers United comprise the Black River Fund Committee, which will determine the distribution of available funding each year.

Government agencies, non-profit organizations, educational institutions and individuals will be eligible to receive funding from the Black River Fund for proposals that

provide clear public benefits, contribute to one or more of the Fund's goals (including water quality improvement, public education, and recreation enhancement), and involve a project or facility located within the City of Watertown. Funding will be provided on a 50%-50% matching basis to selected applicants, and proposals will be considered at least once a year. The Committee will make decisions by majority vote, with each member having one vote.

B. Decommissioning Funds

Decommissioning funds help prepare for a time in the future when it is no longer economically or ecologically viable to generate electricity at a particular dam. FERC has the authority to mandate owner-financed removal of a dam during the relicensing process, as well as the establishment of a decommissioning fund. A decommissioning fund requires the dam owner to collect, over the license term, sufficient funds to finance removal of the dam at the end of the license term. Generally, decommissioning fund provisions require the dam owner to study, in consultation with various resource agencies, the options available and costs involved in retiring the project. Retirement options commonly considered include permanent non-power status without removal of the dam, partial dam removal, or complete dam removal. The dam owner will annually deposit money into a fund in order to ensure that funds are available at the end of the license term to finance the most likely form of dam decommissioning.

***Example: Deerfield River Settlement
(Massachusetts and Vermont)***

New England Power Company (NEP), owner of the eight-dam Deerfield River Hydroelectric Project, signed a relicensing settlement that commits it to prepare for the proper future management of the project upon its retirement from power production. Within five years of license issuance, NEP will complete a study in consultation with the settlement parties and FERC to estimate the costs of various options for retirement in the event of a surrender of the license, or a denial by FERC of a subsequent new license. The study will be submitted to FERC for selection of the best retirement option.

In its first rate filing after FERC approval, NEP will attempt to recover in its wholesale rates (over the remaining license term) the appropriate amounts for project retirement. NEP will file with FERC an annual certification of financial capability demonstrating that NEP has a tangible net worth of at least three times the estimated cost of the project retirement plan. In the event that NEP cannot provide such certification, the company is required to either (a) create a segregated trust fund, into which all funds previously and subsequently collected to support the project retirement plan would be deposited; or (b) purchase insurance, post a bond, or provide other means approved by FERC to ensure that the full amount of funds collected for retirement will be available upon expiration of the project license.

C. Management Committees

Settlement agreements may provide for a supervision committee whose duty is to oversee the coordination and implementation of all conditions of the settlement. The committee's obligations generally include ensuring swift and orderly execution of the settlement terms, disbursing trust fund monies, and resolving any disputes which may arise between signatories. Periodic meetings are established by the committee to oversee the status of the particular project and its progress in satisfying settlement terms. These committees provide a valuable forum for continued cooperation and communication among the dam owner, resource agencies, and conservation and recreation groups over the full term of the license.

Example: Manistee, Muskegon, and Au Sable Rivers Settlement (Michigan)

The coordination and implementation of the Manistee, Muskegon, and Au Sable River settlement will be overseen by a two-level project coordination structure consisting of the Consumers Power Company, Resource Agencies Steering Committee (Steering Committee) and the Manistee-Muskegon-Au Sable Coordination Team (MMAC Team). The Steering Committee will be comprised of one member from Consumers Power Company (dam owner) and one member from each of the four resource agencies. All disputes will be settled by this Steering Committee, which will convene at least once a year. The MMAC Team will be made up of one representative from Consumers Power and each of the

resource agencies, as well as a representative from the Michigan Hydro Relicensing Coalition. This committee will be responsible for the actual supervision of settlement fulfillment, and will assemble as often as necessary to ensure that satisfactory progress

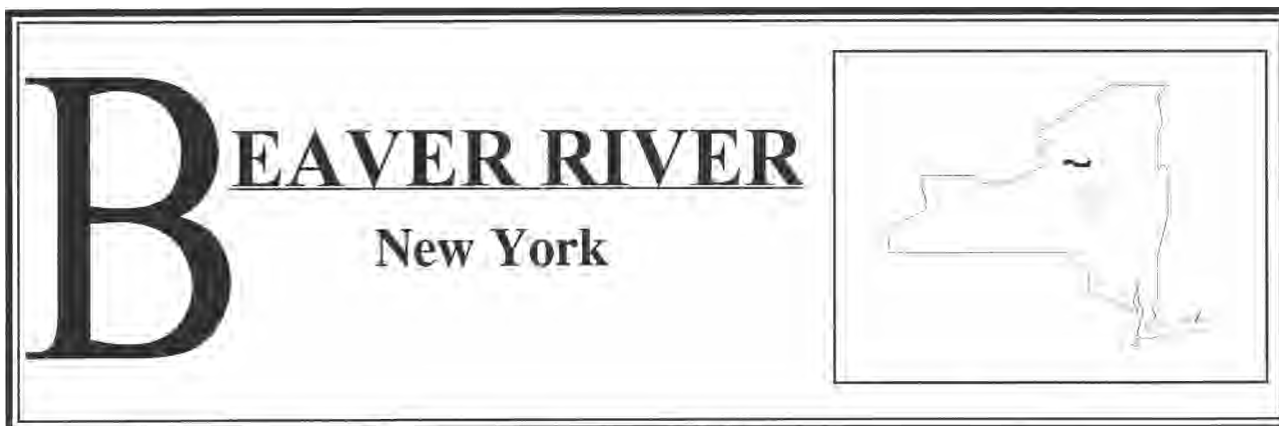
is being made. As one of its many duties, the MMAC Team will periodically inform all interested parties, by newsletter or public meeting, of all recent headway regarding settlement implementation.

Part II

Mitigation Packages



Part II cover photo courtesy of Tim Palmer.



I. Background

A. Project Description

New York State's 50 mile-long Beaver River, characterized by spectacular waterfalls and cascades, begins at Lake Lila in the Northern Forest of the Adirondack mountains and joins the Black River 20 miles east of Watertown. Historical records indicate that when the river was free flowing, it supported excellent brook trout fishing, with large fish a common sight. Most of the Beaver River watershed is protected as part of the State's "Forever Wild" program and is an important wilderness resource for the region, where tens of thousands of visitors come for boating, fishing, hiking, hunting and nature study.

The Niagara Mohawk Power Company is the proprietor of the Beaver River Project, a hydropower development consisting of eight dams on the Beaver River between Stillwater Reservoir and the confluence with the Black River. The Beaver River Project operates under a single Federal Energy Regulatory Commission license that expired on

December 31, 1993. Consisting of the Moshier, Eagle, Soft Maple, Effley, Elmer, Taylorville, Belfort and High Falls dams, the Beaver River Project has a total capacity of 46.4 megawatts. The Project is comprised of modified dams and reservoir impoundments, and has five bypassed reaches that receive very little flow. Moshier dam is located twenty-nine miles from the confluence with the Black River and High Falls dam is eleven miles from the confluence.

B. Reasons for Settlement

Pursuant to Section 401 of the Clean Water Act, the State of New York must issue, or waive the right to issue, a certification that state water quality standards will be met at a hydropower project before FERC can issue a license. Forty-three hydroelectric licenses expired in the State of New York in 1993. In the majority of cases, the State either denied water quality certification or issued certification conditions that were considered overly intrusive by many dam owners. In an appeal of many of these decisions to the State

Supreme Court, Niagara Mohawk received a verdict that the State could only issue water quality conditions directly related to numerical water quality standards, essentially overturning the State's certification decisions. Soon after, the U.S. Supreme Court declared in a separate case (*Jefferson County PUD v. State of Washington*) that states did in fact have the authority to issue water quality certifications with specific flow-based conditions designed to meet designated uses of the river.

A conflict ensued among dam owners and intervenors in New York State concerning the allowable parameters of the State's water quality certifications. Realizing that this conflict may not be resolved without time consuming litigation, intervenors and dam owners have chosen to negotiate conditions that would be included in the water quality certifications and the broader FERC licenses. Settlement discussions are ongoing on nine river basins in the state. A settlement on the Beaver River dam operations was signed in April, 1995.

Parties involved in the negotiation regarding terms for Niagara Mohawk's license application include: New York State Department of Environmental Conservation (NYSDEC), Niagara Mohawk Power Corporation, United States Fish and Wildlife Service, New York Rivers United, Board of Hudson River-Black River Regulating District, New York State Conservation Council, Adirondack Park Agency, Adirondack Mountain Club, Lewis County, Trout Unlimited, American Whitewater



The Beaver River Fund will provide \$590,000 for restoration projects along the river (photo by Steve Massero).

Affiliation, Adirondack Council, National Park Service and American Rivers. All parties agreed to specific mitigation for recreation, minimum flows, reservoir fluctuation, and fish passage and protection.

II. Settlement Terms

A. The Beaver River Fund and Advisory Council

Niagara Mohawk will deposit \$80,000 within one year of FERC license acceptance into a

Beaver River Fund. Niagara Mohawk will contribute no less than \$14,000 annually to the Beaver River Fund for the first fifteen years after license acceptance, and \$20,000 annually for the following fifteen years. All or part of the initial \$80,000 will be used to facilitate the State's acquisition of the following from Niagara Mohawk within eighteen months of license acceptance: (a) a conservation easement, 25 feet in width, around the Moshier reservoir, (b) reserved sand and gravel rights along Moshier bypassed reach and fee title to the abutting acreage to the south, (c) fee title to "Eagle Canyon", all with appropriate reservations for Niagara Mohawk access, operation and maintenance purposes, and (d) any other Niagara Mohawk lands, easements and mineral rights not essential to project operation and not otherwise identified within the settlement. Any money not used to purchase the land will remain in the fund for other uses.

The Beaver River Fund will be used within the Beaver River Basin for projects and services including public education, ecosystem restoration and protection, natural resource stewardship, facility maintenance, and additional public access to outdoor recreational resources not currently agreed to by Niagara Mohawk. The Fund will be administratively managed by Niagara Mohawk and distributed according to the recommendations of the Beaver River

Advisory Council. The Council will consist of many of the settlement signatories and will be chaired by NYSDEC. Each member of the Advisory Council will have one vote, and funds will be allocated based on majority decisions.

B. Recreation

1. Whitewater Releases: Whitewater releases will be provided at three dams during September and October, the exact timing of which will be determined by Niagara Mohawk and American Whitewater Affiliation, in consultation with the Beaver River Advisory Council. At Moshier dam, one four-hour release of 400 cubic feet per second (cfs) will be provided. Ramping flows to increase and decrease the water level gradually to a maximum of 200 cfs will be made two hours before and after the boating flow release. Eagle dam will have five four-hour releases of at least 200 cfs with ramping flows one hour before and after not exceeding 100 cfs. Taylorville dam will have five four-hour releases of up to 400 cfs, with ramping flows not exceeding 200 cfs made before and after the boating flow release for a total duration of no more than three hours. When feasible, releases at the three developments will be coordinated.

The schedule and flows for releases at all three dams may be modified by Niagara

Settlement Highlights

- ☑ Achieved Basin Wide Settlement
- ☑ Established \$590,000 Trust Fund
- ☑ Established the Beaver River Advisory Council

Mohawk and the American Whitewater Affiliation based on the recommendations of the Beaver River Advisory Council, to the extent that any modifications do not exceed the equivalent of 96,600 kilowatt-hours in lost energy generation. This, however, does not limit any newly created opportunities for additional whitewater releases that may arise from future mutually-agreed changes to the terms of this settlement by its signatories.

2. Canoe and Boat Access: Canoe and boat access will be provided at three dams. Niagara Mohawk will provide a new canoe take-out at the downstream end of the Moshier reservoir. This will connect the area's existing trails and launches, enabling the entire river to be paddled. The portage trail from this take-out will use an existing access road and connect to the canoe portage trail near the powerhouse. Vehicular access will not be provided except by special permit for handicapped access and scheduled whitewater releases. At Soft Maple dam, boat access will be provided at the proposed primitive campgrounds in the form of a car-top launch. In addition, Niagara Mohawk will consult with the Adirondack Mountain Club to design canoe route portages at the Belfort dam.

3. Other Recreational Provisions: Other recreational services provided by Niagara Mohawk include rock climbing access at Eagle dam via the existing canoe portage trail located along the lower section of the south side of the bypassed reach, primitive campgrounds at the Soft Maple dam, and kiosks at Moshier and Taylorville dams

providing descriptions of the Beaver River canoe route. In addition, Niagara Mohawk will keep various bypassed reach access trails brushed. Other than the installation of trail markers, the trails will remain primitive and unimproved.

C. Reservoir Management

To protect nesting birds and spawning fish in the reservoirs, Moshier, Soft Maple and Effley dams will have a maximum daily fluctuation of 1.0 foot from their normal maximum headwater elevations between May 1 and June 30. From July 1 to April 30, these developments will have a maximum daily fluctuation of 1.5 feet above their normal maximum headwater elevations.

Eagle, Elmer, Taylorville, and Belfort dams will have a maximum daily fluctuation of 1.0 foot from their normal maximum headwater elevations. High Falls dam will adopt a 1.5 feet maximum daily fluctuation. In addition, any dams utilizing flashboards will not erect or replace them from May 1 to June 30 to further protect the spawning fish and nesting birds.

D. Minimum Flows

Minimum flows will be implemented in the bypassed reaches of all eight dams, ranging from 20 cfs to 60 cfs. At Moshier dam, the minimum flow will be provided through a combination of the existing minimum flow discharge pipe and orifice plate, and a slide gate structure which will also accommodate

whitewater releases and downstream fish passage. Both existing slide gates located at the spillway will be used at Soft Maple, and a diversion tunnel will be added. New gate structures will be provided at Effley, Belfort and High Falls to achieve the agreed minimum flows.

If downward adjustments to any or all of the base minimum flows at Moshier, Eagle, Elmer and Taylorville dams are made, Niagara Mohawk will supplement the Beaver River Fund annually by an amount equivalent to 50 percent of the annual hydropower generating value associated with the difference between the flows selected and the base minimum flows using the energy values prevailing in that year.

E. Fish Passage and Protection

Downstream fish passage will be improved at seven dams. The route for downstream fish passage at Moshier and Effley will be provided by new gate structures. At Elmer, a new release structure will be provided to facilitate downstream passage. Final details of the designs, including: (1) final location; (2) the potential need for other necessary fish protection measures (*e.g.*, distribution of flows between release structures, minor channel modifications); and (3) installation will be undertaken by Niagara Mohawk based on 1995 field inspections and the professional judgement of the Fish and Wildlife Service and NYSDEC within two years of FERC license acceptance.

After three years of providing the Soft Maple minimum flows, NYSDEC will conduct a fisheries investigation on resident brook trout. If the investigation reveals the need to supplement the existing brook trout population, then NYSDEC will commence a four year program of transplanting native brook trout from local heritage streams to enhance prospects for a sustainable brook trout fishery. Niagara Mohawk will provide two fisheries biologists for three days in each year of the transplant program, and any equipment necessary for safe transport of fish during this effort.

Niagara Mohawk will install new trashracks at six dams to keep fish from being entrained into the intake. Niagara Mohawk will have two years to replace the trashracks at Moshier, Soft Maple and Effley, six years to replace the High Falls trashracks, ten years to replace the existing trashracks at Eagle and Taylorville, and fourteen years to replace the trashracks at Elmer and Belfort. Niagara Mohawk will also install a fish screen at Soft Maple within two years of license acceptance.

F. Excluded Provisions

This settlement expressly does not include any condition relating to decommissioning of the Beaver River dams. In addition, no upstream fish passage has been included for any of the dams.

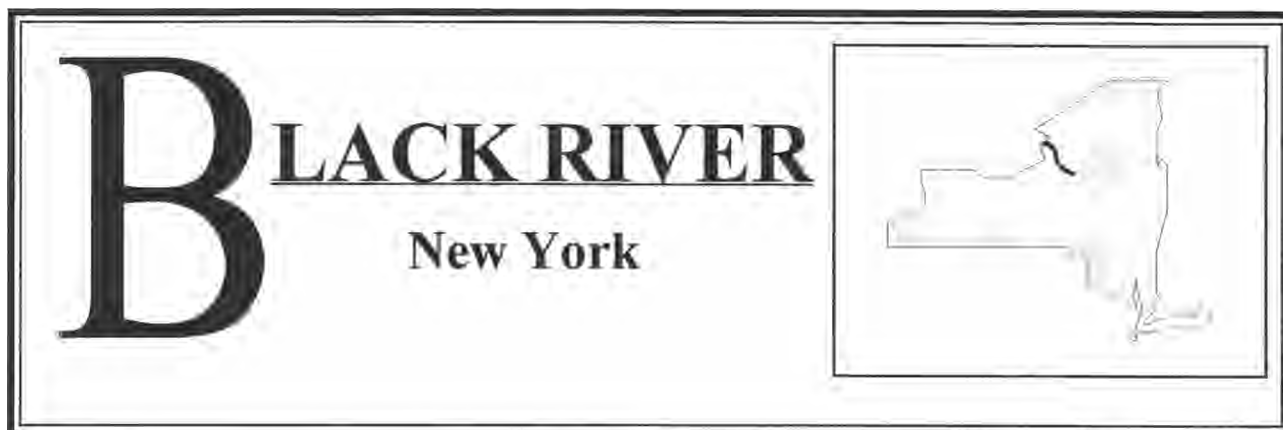
III. Impacts of Settlement

The most significant impact of the negotiated settlement on the Beaver River is the basin-wide scale of the benefits achieved. With all of the river's dams covered in the settlement, the settlement impacts virtually every part of the watershed.

**FOR MORE INFORMATION,
PLEASE CONTACT:**

Bruce Carpenter
New York Rivers United
199 Liberty Plaza
Rome, New York 13440
Tel: (315) 339-2097
Fax: (315) 339-6028
[E-Mail: nyru@igc.apc.org](mailto:nyru@igc.apc.org)

Jeff Sama
New York Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233-1750
Tel: (518) 457-2224
Fax: (518) 457-5965



I. Background

A. Project Description

The Black River originates in the Adirondacks and flows southwest to Forestport, then northwest to Carthage, and finally west into Lake Ontario 112 miles downstream at Black River Bay. The Black River historically provided premier habitat for spawning, feeding and growth for numerous anadromous fish, including Atlantic salmon and brown trout. Since the 1800's, hydropower facilities and flood and erosion control projects have disturbed flow regimes, water quality and riparian vegetation, resulting in the decline of former high quality fisheries.

The City of Watertown operates a 5.4 megawatt hydroelectric project on the Black River, and filed for a new major license on December 30, 1991. The Watertown Project consists of two run-of-river dams, namely the Diversion dam and the Delano dam. A

designated wetland area of seventeen acres is within the Project's boundaries. The City of Watertown license application includes a proposal to increase the total installed capacity of the Project to 10.8 megawatts by replacing all existing electrical and mechanical equipment with new generating units.

B. Reasons for Settlement

Participants in the settlement agreement concerning Watertown's Hydroelectric Project include: U.S. Fish and Wildlife Service, New York State Department of Environmental Conservation (NYSDEC), New York Rivers United (NYRU), American Rivers, American Whitewater Affiliation, Adirondack River Outfitters, Fort Drum Outdoor Recreation Center, T.I. Adventures, and the City of Watertown. The settlement agreement was submitted to FERC on May 17, 1994, and a license was issued in June

1995. All parties agreed to support the issuance of a new license, with the following provisions for fish passage and protection, minimum flow releases, and enhancement of recreational resources.

II. Settlement Terms

A. Fish Passage and Protection

Downstream fish passage and protection facilities will be installed at both dams. Fish passage will be in the form of sump pumps used to increase attraction flows, and a fish discharge conduit with a cone shaped entrance providing a safe downstream route. Final design and construction of the fish passage facility will begin upon receipt of a new license. Installation of upstream fish passage has been deferred by mutual consent of all settling parties until such time as anadromous fish species are reintroduced to the Black River upstream of the Watertown facility. After this occurs, the City agrees to consult with the resource agencies to arrive at a plan to ensure upstream passage.

For fish protection, trashracks with a one-inch bar spacing and 45 degree alignment will replace the existing mechanism in the forebay of the plant. The present trashrack spacing is 3.5 inches at an angle of about 60 degrees.

B. Minimum Flow

The minimum flow release from the Diversion dam was set at 250 cfs. This flow alteration is achieved through a notch in the Diversion dam.

C. Recreation

1. **Whitewater Releases:** Flows will be released through the lower bypass reach for kayakers for 2.5 hours, two evenings per week annually from June through September. Specific flows can be tailored to the skill level of scheduled participants, but not higher than 600 cfs. The approved whitewater flow regime was submitted to FERC in May, 1994.

2. **Public Access:** The City amended an ordinance on March 21, 1994, to allow the



The Black River settlement provides significant opportunities for river recreation (photo by Don Cochran).

public to access the shoreline at Waterworks Park. Previously, this access was prevented by a chain link fence. A kayak launch and fishing access site will be constructed at Waterworks Park by December 1996.

The portage take-out on the reservoir has been moved for convenience, and will be provided with directional signs. The limestone terrace at the bottom of the construction road will be graded to the river's edge to make it easier for people to enter their boats. A small current barrier will be placed just upstream of this put-in so boaters will have calm water for boat launching.

The portage take-out will also serve as a hand-carry boat launch for boaters wishing to access the 3.5 mile long reservoir for fishing and other forms of recreation. A paved and graded disabled fishing access was constructed at this location in 1994. Parking for the cartop boat launch and barrier free fishing access will be constructed near the portage take-out.



Anglers will be provided access to the tailrace at the existing canoe put-in below the powerhouse. Fishing access will also be made available from Waterworks Park with parking provided at the park entrance. Parking for tailrace fishing access will be available in the Power Plant Park parking area.

D. Black River Fund

The City of Watertown has agreed to establish the Black River Fund, which shall be used to finance projects and facilities that conserve and enhance the fish, plant and wildlife resources of the Black River. Other appropriate expenditures include improvement of water quality, public education and recreation enhancements. Approximately 60 days after license acceptance, Watertown contributed \$30,000 to the Fund. Beginning three years after substantial completion of construction of the 10.8 megawatt powerplant expansion, \$10,000 (stated in 1995 dollars) will be added to the Fund annually.

The City Manager, the Commissioner of the NYSDEC, and the Executive Director of NYRU will comprise the Black River Fund Committee, which shall determine the distribution of available funding for each year. Government agencies, non-profit organizations, educational institutions and individuals shall be eligible to receive funding from the Fund for proposals that provide clear public benefits, contribute to one or more of the Fund's goals, and involve a project or facility located within the City's boundaries. Funding will be provided on a 50 % -50 % matching basis to selected applicants, and proposals will be considered at least once a year. The Black River Fund

Settlement Highlights

-  Public access to previously restricted shoreland
- Whitewater boating improvements
-  Fish passage

Committee will make decisions by majority vote, with each member having one vote.

E. Watertown Project Lands

The City shall not permit development of any part of Delano Island during the term of the new FERC license, to conserve the fish, plant, and wildlife resources of the Black River.

F. Watertown Project Fund

The City acknowledged its responsibility to ensure the proper future management of the project. The City shall deposit into the Watertown Project Fund amounts which it determines are appropriate, over the term of the license, to accumulate the anticipated cost of repairing, replacing, or retiring the project's energy generation equipment and facilities at the end of their useful lives. The City will not contest a FERC requirement to provide financially for the retirement of the project unless the order substantially interferes with the project's viability.

III. Impacts of Settlement

The agreement regarding the Watertown Dam has transformed the Black River below Watertown (a heavily developed industrial river), into an outstanding recreational river by providing scheduled recreational flows from May through October. This is the only river in the region which provides

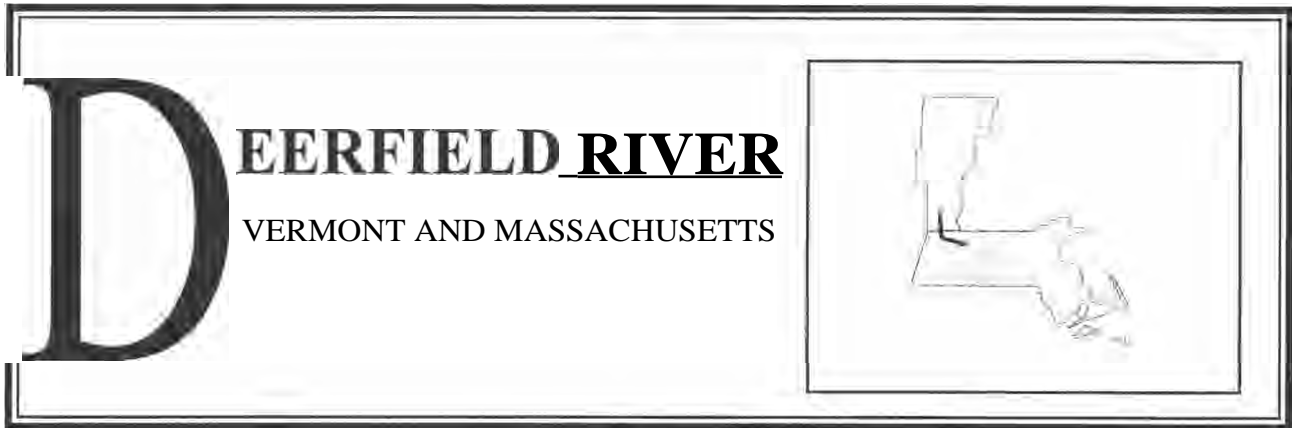
dependable and scheduled whitewater boating flows through the summer months. Prior to this agreement, flows were determined solely for the purposes of hydropower generation.

Today, commercial businesses take an estimated 10,000 boating enthusiasts down the Black during the spring, summer and fall seasons, generating some \$700,000 in direct sales annually. Indirect sales (restaurants, hotels and other local businesses) have also dramatically increased. Perhaps more importantly, recreation and tourism has changed the way in which the City of Watertown views the Black. Once considered a heavily polluted and dangerous river, Watertown has recently upgraded the riverside area with walkways, overlooks and a public pavilion.

FOR MORE INFORMATION, PLEASE CONTACT:

Bruce Carpenter
New York Rivers United
199 Liberty Plaza
Rome, New York 13440
Tel: (315) 339-2097
Fax: (315) 339-6028

Jeff Sama
New York Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233-1750
Tel: (518) 457-2224
Fax: (518) 457-5965



I. Background

A. Project Description

The 66 mile Deerfield River drains more than 650 square miles in Massachusetts and Vermont, and is a major tributary to the Connecticut River, New England's largest river. Until recently, several paper mills and the country's first nuclear power plant severely polluted the river. With the closing of the nuclear power plant and other major industrial sources of pollution, however, the nine hydropower facilities, owned and operated by New England Power, are the only remaining major impediment to a healthy aquatic ecosystem. The reservoirs and diversions for hydropower currently de-water over 12 of the 66 river miles, and cause unnatural fluctuating flows in an additional 33 miles of river.

New England Power Company's (NEP) Deerfield River Project includes eight dams and 15 generating units which currently

produce 85 megawatts of capacity and approximately 190,000 megawatt hours of hydroelectric energy annually. The Deerfield project operates under a single FERC license that expired on December 31, 1993. The eight dams included in the Deerfield Project are: Somerset, Searsburg, Harriman, Sherman, and Numbers 5, 4, 3 and 2. Somerset and Harriman contain storage reservoirs. All dams except Somerset generate power and are peaking facilities.

B. Reasons for Settlement

NEP and various interested parties felt that a long-term relationship of cooperation could be achieved through a settlement of license conditions, and willingly entered into negotiation. A settlement was signed in October 1994. The value of the enhancement and mitigation in the settlement agreement is estimated to be \$25-30 million.



The Deerfield settlement will restore a healthy ecosystem to this "working river" (photo by Margaret Bowman).

The parties involved in the settlement include: the Environmental Protection Agency, the National Park Service, the United States Fish and Wildlife Service (FWS), the Massachusetts Division of Fisheries and Wildlife (MDFW), the Massachusetts Department of Environmental Management, the Massachusetts Department of Environmental Protection, American Rivers, American Whitewater Affiliation, the Appalachian **Mountain Club**, the Conservation Law Foundation, the Deerfield River Compact, the Deerfield Watershed Association, New England FLOW, and Trout Unlimited. The settlement recommends the issuance of a forty-year license, and provides terms and conditions for the enhancement of fisheries, fish passage, wildlife, land management and control, recreation and aesthetic issues, and water quality.

The settlement is being considered as a viable alternative in FERC's environmental impact assessment of the Deerfield River basin, which is presently ongoing. The State of Massachusetts has issued its Clean Water Act Section 401 water quality certification with conditions consistent with the settlement.

The State of Vermont's water quality certification conditions, issued after the settlement, require more restrictive flows. **This**

certification is presently under appeal by the Vermont Natural Resources Council and NEP.

II. Settlement Terms

A. Minimum Flows

Flows below all dams must be maintained according to standards set in the settlement, and range from 12 cfs to 200 cfs (special whitewater releases, discussed below, fall outside of this range). At the Somerset, Searsburg, Harriman, and Number 4 dams the flows will vary seasonally, and at Numbers 5 and 3, the flows will be the lesser of a fixed flow rate or the inflow. At the Number 5 dam, inflow will not be less than the 57 cfs guaranteed at Harriman dam. Below the Fife Brook and Number 2 dams,

the flow will be constant year-round. Below the Somerset dam between May 1 and July 31, the flow may be reduced to 9 cfs if necessary to maintain reservoir elevations. These releases return water to twelve miles of river which currently receive little or no water at times and enhances flows in another 33 miles of river.

B. Reservoir Management

The Somerset reservoir will maintain a stable elevation to facilitate loon nesting during the period of May 1 through July 31 annually. The reservoir elevation will remain within a range of +/- 1 foot. The Harriman reservoir will be managed to support spawning rainbow smelt and smallmouth bass. Between May 1 and June 15, the reservoir elevation will be stable or rising. From June 16 through July 15, the reservoir water level will drop no more than 1 foot per day.



Flows will be restored to 12 miles of currently dry river (photo by Kenneth Kimball, Appalachian Mountain Club).

Within one year of the issuance of a new license, NEP agrees to submit a plan to FERC proposing means to monitor, report and verify the minimum flows and reservoir operations required by this settlement. The plan will be prepared in consultation with the resource agencies. Implementation of the plan will occur within two years of license issuance unless otherwise directed by FERC.

C. Fish Passage

Plans have been provided for downstream fish passage facilities at dams 2, 3 and 4. NEP agrees to implement these plans as modified by the FWS within two construction seasons of license issuance. Prior to operation of the downstream fish passage facilities, NEP will submit a plan for evaluating their effectiveness to FWS and MDFW for review and comment.

Upstream fish passage will be provided at the Number 2 dam for adult Atlantic salmon returning to the Deerfield. Adult Atlantic salmon will be radio-tagged and released at the Holyoke dam, downstream in the Connecticut River, and monitored at stations along the Deerfield, in accordance with a plan to be developed by NEP and approved by the Connecticut River Atlantic Salmon Commission technical committee. Once specified numbers of salmon are found returning to the Deerfield River

dams for two consecutive years, NEP will install a permanent upstream trap facility within two construction seasons in accordance with plans provided, or implement an alternative system mutually agreed to by NEP, FWS and MDFW.

D. Recreation

1. **Facilities:** NEP agrees to install, operate and maintain the facilities designated in the recreation plan in accordance with the schedule provided therein. The basin-wide recreation plan upgrades selected picnic areas, boat launches, whitewater put-ins, take-outs and portages, hiking and ski trails, along with new construction of five camping sites, two picnic areas, two boat launches, two whitewater take-outs, two portage trails and five hiking trails.

2. **Access:** NEP will provide public access to the river, reservoirs and undeveloped project land. No access fees will be charged.

3. **Whitewater Releases:** Whitewater releases will be provided at the Fife Brook and Number 5 dams. Fifty weekend and fifty-six weekday releases will occur annually at Fife Brook dam from April 1 through October 31. Fife Brook releases shall be continuous for at least three hours starting at some time between 9:30 a.m. and 12:00 p.m. At Number 5, twenty-six weekend or holiday releases and six Friday releases into the

bypass will occur between April 1 and October 31. Friday releases shall be continuous for at least four hours starting at 11:00 a.m. Saturday releases shall be continuous for at least five hours beginning at 10:00 a.m., and Sunday releases will be continuous for at least four hours starting at 10:00 a.m.

Settlement Highlights

- ☒ Rewater over 12 miles of river
- ☒ Increase flows in 33 miles
- ☒ Study possibility of creating decommissioning fund
- ☒ Comprehensive look at the river basin

NEP will meet with representatives of New England FLOW or its successors and other interested members of the public before January 1 of each year to develop cooperatively release schedules for the coming summer. NEP and New England FLOW will

disseminate the release schedules to the public. NEP will continue to provide a river flow information phone service, updated daily, providing recorded flow level and release schedule information.

In the event that natural low flow conditions restrict NEP from providing electric generation and whitewater releases according to the schedule, NEP will notify and meet with FLOW and other interested members of the public to arrive cooperatively at a reduced schedule that takes natural conditions into account. Scheduled releases will be canceled because of power generation needs only when performing the release will, or is likely to result in, interruption of service to electricity consumers. In the event scheduled releases are canceled, they will be

included as additional releases over the next two year's schedules.

E. Project Lands

NEP will grant term conservation easements for the length of the license to qualified government or non-government land management organizations to provide for the continued preservation in a natural state of 18,335 acres of riparian and watershed lands owned by the company. The intent of the conservation easements is to protect the aesthetic quality, forest and other natural resources of the lands from uses that would conflict with preservation. The holders of the conservation easements will be selected by NEP, the Conservation Law Foundation, and the Appalachian Mountain Club through unanimous decision. NEP will reimburse the easement holder's reasonable costs for monitoring and enforcing the terms of the conservation easement, and give the holders an option to purchase, at fair market value, easement lands which are not required for electrical generation and transmission purposes.

F. Forest and Wildlife Management

NEP agrees to adopt and implement the following goals for its timber management program: (1) Protect riparian zones along rivers and lakes, (2) Protect visual quality within important public viewsheds and along trails, (3) Protect fragile or highly erodible soils, (4) Prevent excessive nutrient depletion

of low productivity soils, (5) Provide appropriate application of the clearcutting reproduction method, and (6) Protect and manage wildlife habitat for all species that may be reasonably expected to occur on project lands. NEP will also preserve existing beaver flows in the vicinity of Somerset Reservoir and build nesting structures for wood ducks, osprey and loons.

G. Enhancement Fund

Within sixty days of the issuance of a new license, NEP will establish the Deerfield River Basin Environmental Enhancement Trust Fund in the amount of \$100,000. The Fund will be administered by a three member committee, which shall determine the investment strategy for the fund and the appropriate distribution of available funds for each year. The committee will include a representative of NEP, and designees of the Vermont Agency of Natural Resources, and the Massachusetts Executive Office of Environmental Affairs. Fund dollars will be used to finance watershed conservation, develop low impact recreational educational projects and facilities, and plan, design, maintain and monitor the facilities and projects. Expenditures will be made based on unanimous decisions.

H. Dam Retirement Fund

NEP acknowledges its responsibility to plan for and collect funds in anticipation of the proper future management of the Deerfield Project upon retirement from power

production. Within five years, NEP will complete a study in consultation with the parties of the settlement and FERC identifying and estimating the costs of various options for the retirement of the project. After review, the parties will select the most appropriate likely option for eventual retirement of the project and submit it to FERC for approval.

NEP will file with FERC an annual certification of financial capability demonstrating that NEP has a tangible net worth at least three times the estimated cost of the Project Retirement Plan. If unable to provide this certification of financial capability, NEP will within six months either: (a) create a segregated trust fund, into which the full amount of funds previously and subsequently collected to support the Project Retirement Plan would be deposited; or (b) purchase insurance, post a bond, or provide other means previously approved by FERC ensuring that the full amount of funds collected to implement the Project Retirement Plan will be available upon the expiration of the license.

III. Impacts of Settlement

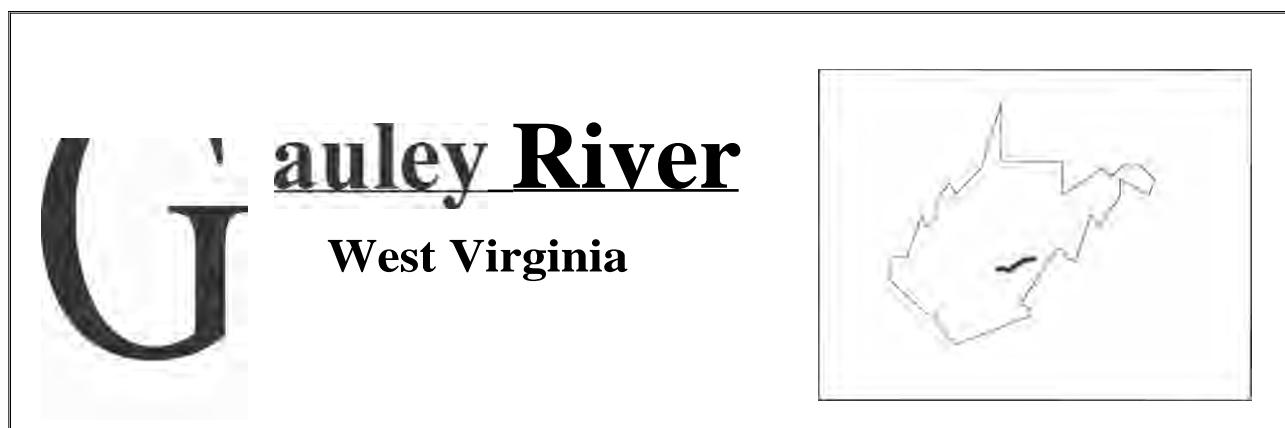
The Deerfield River settlement set an important precedent in river conservation in the Northeast. It demonstrated that watershed-scale restoration could be achieved

through the FERC licensing process, benefitting areas measured in miles not feet. With some recreational mitigation already being voluntarily provided by New England Power, the Deerfield has become an important resource for the Northeast by providing recreation for many of the 10 million people who live within 100 miles of the river, and producing significant economic benefits for local communities. Today more than four outfitters run the Deerfield, generating \$1.2 million a year in revenues, and paying out more than \$400,000 in wages and salaries to over 150 people. Including indirect benefits, the Charlemont area alone receives a \$3 to \$4 million boost each year from the rafting industry.

FOR MORE INFORMATION, PLEASE CONTACT:

Ken Kimball
Appalachian Mountain Club
Box 298--Route 16
Gorham, NH 03581
Tel: (603) 466-2721
Fax: (603) 466-2822
[E-mail: 6136277@mcimail.com](mailto:6136277@mcimail.com)

Cleve Kapala
New England Power Company
4 Park Street
Concord, NH 03301
T: (603) 225-5528
F: (603) 225-3260
[E-mail: kapala@neesnet.com](mailto:kapala@neesnet.com)



I. Background

A. Project Description

The Gauley River flows through West Virginia and is considered one of the premier whitewater rivers in the nation. The Summersville dam is located near the City of Summersville in Nicholas County, West Virginia, and was originally constructed in the 1960's by the Army Corps of Engineers for flood control. In order to accomplish this objective, the reservoir must be drawn down each fall to prepare for the spring snow melt runoff. Due to the lobbying efforts of several whitewater enthusiasts, the Corps agreed to accomplish the fall drawdowns in a series of weekend (Thursday through Sunday) daytime releases. Appropriations legislation in 1983 mandated these scheduled whitewater releases on the Gauley, which were reinforced by the West Virginia National Interest Conservation Act of 1987. A commercial whitewater rafting industry

and private boating season emerged to take advantage of the guaranteed releases. Restructured flow schedules and the growth of whitewater boating have resulted in an annual whitewater industry on the Gauley estimated at \$33 million.

In 1988, the West Virginia National Interest River Coalition Act designated the Gauley River below the Summersville dam as a National Recreation Area. Trout fishing, hiking, and spectacular scenery are additional Gauley resources that attract thousands of visitors each year.

B. Reasons for Settlement

Noah Corporation, representing the City of Summersville, has tried to license the Summersville dam for hydropower production for the past ten years. A license application is presently pending before FERC

for a 100 megawatt generation facility at the dam. Due to the Gauley's status as a National Recreation Area, the National Park Service has an important voice in the FERC licensing process. Because of this, the City of Summersville and the Noah Corporation entered into negotiations with the National Park Service regarding conditions for a FERC license. The resulting Memorandum of Understanding, signed in July of 1991, includes provisions that will enhance recreation while not hindering the established whitewater industry during project construction. The National Park Service has indicated to FERC that it will not oppose the license so long as these conditions are met.

II. Settlement Terms

A. Recreational Facilities

The Noah Corporation and the City of Summersville will replace the existing rafting put-in prior to the initiation of construction for the hydropower project. Design, materials and siting will meet National Park Service specifications and approval, and will extend trails leading from the parking area to the put-in for convenient access. Engineering and construction will be guaranteed against erosion or structural defects for five years following

construction completion at the Summersville dam.

The licensee will also improve the access trail to the kayak put-in to improve safety and control erosion. Completion will occur before project construction is initiated, and design and materials will meet the specifications of the National Park Service.

Noah Corporation and the City have agreed to construct a gender-separate restroom and changing area facility within the vicinity of the Summersville dam. The licensee will meet National Park Service specifications and consult with the Army Corps of Engineers regarding a possible tie-in with existing sewage treatment facilities. If existing facilities are inadequate, the licensee will construct the necessary treatment facilities



The Gauleys valuable whitewater recreation opportunities are protected by the agreement (photo courtesy of American Rivers).

within five months of National Park Service direction. The licensee will also provide picnic tables near the project area, and install appropriate interpretation and information signs in the project area according to National Park Service specifications and approval.

The licensee will turn the facilities described above over to the National Park Service for operation when they are completed. The lands where the facilities will be located are currently owned by the Army Corps of Engineers and will be transferred to the National Park Service.

Settlement Highlights

- ☑ River access improvements
- ☑ Construction of recreation facilities
- ☑ Minimum flow guarantees

Summersville will suspend the transportation of material and equipment to the construction site from 7:00 a.m. to 12:00 p.m. during the fall drawdown season when recreational flows are planned. On weekends during this period, construction workers will be shuttled from the top of the dam to the worksite.

The licensee will generate hydropower only from those flows established by the appropriate State and Federal agencies and in no way impede those flows in accordance with the West Virginia National Interest River Conservation Act of 1988, **the act that**

established the drawdown schedule favorable for whitewater boating.

B. Repair and Review

The Noah Corporation and the City of Summersville will repair the erosion to the river bank just below the Summersville dam. They will landscape the project construction area, within reasonable cost, to the specifications and approval of the National Park Service and the Army Corps of Engineers. The National Park Service will periodically review the project construction. When the work is completed, the licensee will repair and resurface the access road to the Summersville dam.

The licensee will also ensure that any significant negative impacts from project construction and operation to the natural, cultural, scenic and recreational resource values of the National Recreation Area will be mitigated in a timely manner and in accordance with National Park Service specifications.

C. Construction and Operation of Hydropower Facilities

During construction and operation of the hydropower facility, Noah and the City of

III. Impacts of Settlement

With its scheduled Fall whitewater releases, the Gauley River has become a major recreation resource for West Virginia. Thousands of visitors come to Summersville every Fall to experience the Class III, IV and



V rapids in the Gauley. The settlement agreement will ensure that this important resource is not damaged by construction and operation of a hydropower facility at the dam.

**FOR MORE INFORMATION,
PLEASE CONTACT:**

Pope Barrow
American Whitewater Affiliation
136 13th Street, SE
Washington, DC 20003
Tel: (202) 225-6060
Fax: (202) 546-3766
[E-mail: 72702.1552@compuserve.com](mailto:72702.1552@compuserve.com)

Lorrie Sprague
New River Gorge National River
Gauley River National Recreation Area
Bluestone National Scenic River
National Park Service
Box 246
Glen Jean, WV 25846
Tel: (304) 465-0508
Fax: (304) 465-0591

Manistee, Muskegon and Au Sable Rivers Michigan



I. Background

A. Project Description

The Manistee River and its tributaries drain a 1,780 square mile area of Michigan's lower peninsula into Lake Michigan. Portions of the Manistee's mainstem and two of its tributaries, Bear Creek and Pine River, are protected under the federal Wild and Scenic Rivers Act. The remaining portions of the watershed are proposed for protection under the Michigan Natural Rivers Act. The Manistee River mainstem is said to have the most stable flows of any stream in the country, and the overall water quality is excellent.

The Au Sable River drains approximately 1,600 square miles of northeast lower Michigan into Lake Huron. Five major tributaries make up the Au Sable watershed: the North, South and East Branches of the

Au Sable, Big Creek and Pine River. The majority of the Au Sable River and its tributaries are designated and protected under the Michigan Natural Rivers Act and the federal Wild and Scenic Rivers Act. The Au Sable has historically been known for its stable flows, cold summer water temperatures and clear water. The Au Sable is known for its outstanding recreational trout angling, canoeing and nature study, hunting and trapping, and picnicking and camping. Despite the considerable use of this area by recreationists who gain access through a patchwork of federal, state, municipal and Consumers Power Company lands, the Au Sable watershed remains beautiful and relatively undisturbed.

The Muskegon River is considered intermediate between coldwater and true warmwater streams. It originates in north-central Michigan and drains more than 2,350

square miles of land into Lake Michigan. All public lands in the watershed are used extensively for hunting and nature appreciation, and the river is a very popular fishing and boating area. The entire mainstream of the Muskegon River, and one of its major tributaries, the little Muskegon River, are proposed for protection as Natural Rivers under the Michigan Natural Rivers Act. All biological communities in the river system will benefit from the improvements and protections provided by the settlement agreement.

Consumers Power Company operates eleven individually-licensed hydroelectric projects on these rivers, with a total capacity of 124.7 megawatts. Six hydroelectric dams on the Au Sable have a combined capacity of 41 megawatts and include the Mio, Alcona, Loud, Cooke, Five Channels and Foote dams. The Hodenpyl and the Tippy Hydroelectric dams operate on the Manistee River with a total capacity of 37.1 megawatts. Three projects are in operation on the Muskegon River with a combined capacity of 46.6 megawatts. These are the Rogers, Hardy, and Croton dams. All of the Federal Energy Regulatory Commission licenses for these projects expired on December 31, 1993.

B. Reasons for Settlement

Consumers Power corporate staff initiated discussions regarding a potential Settlement Agreement in October 1991, immediately after an agency consultation meeting. The consultation meeting had been a

disappointment for the resource agencies as well as Consumers Power as no progress had been made toward agreement on many outstanding issues. Once negotiations began, progress was swift and consensus was reached in approximately one year. The settlement agreement was submitted to FERC in November of 1992. FERC adopted the settlement with a few adjustments, and issued forty-year licenses to Consumers Power on July 15, 1994.

Parties signing the settlement agreement include: Consumers Power, U.S. Fish and Wildlife Service, U.S. Forest Service, National Park Service, Michigan Department of Natural Resources and the Michigan State Historic Preservation Officer. The Michigan Hydro Relicensing Coalition was involved in the negotiations, but all agreed that the settlement itself would only be signed by resource agencies and the dam owner. All parties agreed to a series of environmental mitigation, and supported new forty-year licenses for all eleven projects.

Consumers Power will provide approximately \$50 million over the new license terms for mitigation and enhancement activities at the eleven projects. Expenditures of the \$50 million include the study and construction of recreational facilities and facility improvements, fish protection devices, fisheries habitat restoration, water quality enhancements, archaeological resource evaluation and soil erosion control.

II. Settlement Terms

A. Dam and Reservoir Operation

Consumers Power shall operate Rogers, Mio, Alcona, Croton, Hodenpyl, Foote, and Tippy dams as run-of-river projects. Consumers Power shall contract with the U.S. Geological Service to install and maintain a flow gauge with telemetry upstream of each of these projects. Installation of flow gauges will be complete within two years of licensing, and each project will commence with run-of-river mode at that time.

Hardy, Loud, Five Channels, and Cooke dams will continue to operate as modified-peaking facilities. However, steps will be taken to minimize impacts on reservoir habitat through limitation of maximum fluctuations during daily operation and necessary drawdowns.

Maximum daily reservoir fluctuation limitations for the peaking dams range from 0.3 to 0.8 feet. During drawdowns for maintenance, Rogers, Hardy, Croton, Mio, Alcona, Hodenpyl, and Tippy dams will not exceed a one-foot reservoir fluctuation per twenty-four hours. The remaining dams will not exceed drawdowns of two feet per twenty-four hour period.



Lands along the Au Sable will be protected by the settlement (photo by Chris Brown).

B. Land Management

Each river system will have its own Land Management Plan approved by resource agencies and FERC. The plan will be developed cooperatively by the parties involved in negotiation, and shall include the

following: (1) a bald eagle management plan; (2) a wildlife management plan; (3) a buffer zone management plan; (4) a recreation development plan; and (5) a land lease program.

1. **Bald Eagle Management Plan:**

Project-specific mitigation as described in the final Environmental Impact Statement for the Au Sable River will be **included** in each plan. **Human activity will be restricted** in protection zones established by the licensee around all critical roosts, perching sites and nest trees. The cost of implementation and maintenance, provisions for funding, an implementation schedule, and monitoring and reporting schedules for the proposed measures will also be included in the plan.

2. Wildlife Plan: The wildlife plans shall include: (a) a description of project-specific wildlife protection and enhancement measures; (b) a description of the benefits that would result from the proposed measures; (c) the cost of the proposed enhancement and protection measures; (d) provisions for funding; (e) an implementation schedule; and (f) a monitoring and reporting schedule.

3. Buffer Zone Plan: The width of the buffer zones on project lands shall be 200 feet unless it is determined and justified that more or less than 200 feet is needed in certain areas. The buffer zone plans shall include:

- Allowable uses and conditions;
- Maps delineating the buffer zone area;
- Criteria for selecting widths;
- Provisions for maintaining a no-tree-cutting zone around project impoundments;

- Measures to minimize removal of shoreline vegetation;
- Measures to ensure that maintenance of project transmission lines near the shoreline minimizes adverse aesthetic effects;
- Screening of buildings, parking areas and other visual features that are visible from the shoreline or impoundment by buffer zone plantings;
- Costs, monitoring and reporting schedules; and
- Methods of acquiring buffer zone lands.

4. Recreation Development Plan: A conversion of hydropower operations from peaking to run-of-river at seven riverine projects, and modified peaking operations at the four other facilities will improve recreational opportunities both in the rivers and on the reservoirs.

For each of the three rivers, Consumers Power will also develop a recreation development plan which provides for the improvement **and enhancement of** recreational facilities and access at specific sites. Measures include upgrading and/or installing roadways, parking areas, boat ramps, swimming beaches, directional signs, canoe landings, canoe slides, toilets, gravel paths, stairs, boardwalks, barrier-free fishing areas and skid piers. Consumers Power will also share 50% of the costs for interpretive signs and maintenance. Each tailwater and each reservoir will have at least one barrier-free access site. The plan will describe the



entities responsible for construction, operation, and maintenance of existing and proposed facilities, and will include an implementation schedule.

Consumers Power will fund capital costs to a maximum of \$2.5 million in 1992 dollars (adjusted for changes in the Consumer Price Index) for the study, planning, design, and construction of additional recreational facilities or facility improvement which are consistent with the land management plan for the three rivers. Operation and maintenance costs related to the land management plans are not included in the \$2.5 million. The operation and maintenance costs of \$132,000 for Michigan Department of Natural Resources and \$183,000 for U.S. Forest Service managed facilities will be paid annually by Consumers Power to the respective agencies.

Settlement Highlights

- ☞ Riparian land protection
- ☞ Establishment of a retirement trust fund
- ☞ Establishment of oversight committees to supervise implementation

- Provide a plan for safe and adequate docking facilities, and consolidate existing multiple dock sites in a central location in consultation with the agencies and park management;
- Develop a plan to convert a number of seasonal sites to transient sites to provide for additional transient camping, the appropriate mix being determined in consultation with the agencies, park management, campground users, and other members of the public;
- Provide annual placement and maintenance of safety buoys and, where necessary, toilet and change house facilities; and
- Review public use fees for all such facilities in consultation with the agencies and park management.

5. Land Lease Program: Consumers Power will revise their land lease program and lease instrument in accordance with applicable government standards, U.S. Forest Service special use permits, and other applicable requirements for camp grounds, boating access sites, swimming beach/picnic areas, and marinas.

In addition to the measures mentioned above in the recreation development plan section, improving the land lease program will:

C. Fish Passage and Protection

1. Fish Passage: Consumers Power will provide, as appropriate, the design, construction, operation, and maintenance of upstream and downstream fish passage structures at each project. The Michigan Department of Natural Resources first will prepare, in conjunction with the public, a

comprehensive river management plan for each river. In the event that the agencies submit a joint report to Consumers Power listing the fish species to be passed and recommending biological design parameters for fish passage facilities, Consumers will submit within twelve months a design plan and schedule for installing fish passage structures to FERC for approval.

The plan will be prepared after consultation with the resource agencies and will be submitted with a schedule for installation. Installation of fish passage structures by Consumers Power will be completed within two years after FERC approval. Consumers Power will also submit an operation and maintenance plan to the agencies for review and recommendations. Consumers Power will also propose to the agencies any necessary modifications to fish passage structure or operations.

2. Fish Protection and Lost Fish Compensation: Consumers Power will provide capital costs to a maximum of \$5 million (all sums are in 1992 dollars) to study, plan, design and construct fish protection devices or measures. Operation and maintenance costs related to the fish protection devices and measures are not included in the \$5 million. If the entire \$5 million is not spent, the balance will be retained by Consumers Power and contributed to the State of Michigan Habitat Improvement Account.

Beginning in 1995, the licensee shall provide annual contributions of \$575,000 in 1992

dollars (adjusted annually for changes in the Consumer Price Index) for fish losses due to turbine entrainment mortality to the State of Michigan Habitat Improvement Account. The Account will be used for fish habitat restoration and other fish management purposes at or near the projects. If the new fish protection measures are effective, FERC has the authority to reduce the mandated annual contributions for fish losses. The effectiveness of the fish protection measures will be determined by comparing the results of the pre-application fish entrainment and mortality studies with a single, one-year study of a similar scope performed after the fish protection measures are installed.

D. Water Quality

1. Mitigation: Consumers Power shall fund capital costs in the amount of \$1.75 million for study, planning, design, and construction of water quality protection systems. Limits have been established for maximum temperature and minimum dissolved oxygen levels for each dam, and monitoring devices will be installed at the dams to measure compliance with these standards. If, based on the monitoring results, the water quality standards are not being met, Consumers Power will recommend and, upon approval of FERC and the resource agencies, implement additional protection measures.

2. Liquidated Damages for Non-Compliance (not included in FERC license articles): Liquidated damages shall accrue during dispute proceedings of temperature and/or dissolved oxygen limit

violations, but payment of damages shall be stayed until the dispute is resolved. Liquidated damages can be levied by the Michigan Department of Natural Resources, the Forest Service and the Fish and Wildlife Service. For exceedance of temperature limits, liquidated damages are \$1,500 per exceedance, per month, per project. For non-compliance of dissolved oxygen limits, one to twelve violations per month, per project result in liquidated damages of \$100 per day. For 13 or more violations, liquidated damages are \$200 per day.

3. Re-Opener Clause (not included in FERC license articles): Every fifth year after signing the settlement, any party may petition to modify the dissolved oxygen or temperature limits to ensure the protection of public health, safety and natural resources.

E. Soil Erosion Control

Within one year from the issuance of the licenses, Consumers Power will complete a soil erosion control plan to limit erosion and slope instability and to minimize the quantity of sediment resulting from project operations. One million dollars in funds (up to \$200,000 per year for 10 years) will be provided by Consumers Power for implementation of the Soil Erosion Control Plan. The Plan will include provisions for: (1) identifying streambank and reservoir soil erosion sites; (2) prioritizing a schedule for erosion control; and (3) indicating potential control alternatives.

F. Historical and Cultural Resources

Consumers Power will provide a total of \$1 million for the duration of the license (in 1992 adjusted for CPI) for implementing the cultural resource management plans called for by the "Programmatic Agreement Among [Federal and State Agencies] and the Michigan State Historic Preservation Officer for the Management of Historic Resources Affected by Consumers Power Company's Hydroelectric projects." The plans provide for historical and archeological (cultural) resource evaluation, mitigation, and enhancement activities for each of the projects on the three rivers. Costs for the development of the plans are not included in the \$1 million.

G. Dam Removal

All parties agreed that significant ecological, recreational, scenic, aesthetic and cultural benefits would be realized if the Stronach dam, included in the Tippy Project license, were removed. Dam removal studies have been completed, and if FERC analysis results in a finding that net public benefits would be achieved by removal, Consumers Power agrees to remove the dam. Consumers Power shall fund up to \$750,000 for the removal and river restoration.

H. Dam Retirement Fund

To help assure the availability of funds when the dams are retired, the settlement provides

for the establishment of a retirement trust fund. The purpose of the fund is: (1) to lessen the burden on Consumers Power should the dams be decommissioned at some point in the future; and (2) to broaden the range of retirement options.

Within ten years of license issuance, Consumers Power will begin consultations with the resource agencies and the general public to consider plans for studying the costs that would be associated with potential retirement of the projects. Consumers Power will submit to FERC a study plan that, at a minimum, will describe the scope of study, and include the retirement options to be examined, why they were selected, and what actions would be involved under each option. The plan will also contain an assessment of the likelihood of project retirement at or before the end of the license term.

Consumers Power then will file the study report documenting the results and a funding plan for retirement costs with FERC. Consumers Power will simultaneously send copies to the resource agencies and make the report available to the public. Following a public hearing, FERC may issue orders with respect to project retirement and financing.

I. Coordination Committees

The coordination and implementation of the Manistee, Muskegon, and Au Sable Rivers Settlement will be overseen by a two-level project coordination structure consisting of the Consumers Power Company Resource Agencies Steering Committee (Steering

Committee), and the Manistee-Muskegon-Au Sable Coordination Team (MMAC). The Steering Committee will be responsible for the resolution of any disputes, and will meet at least once annually to review the progress of overall settlement implementation. Members include Consumers Power, Michigan Department of Natural Resources, US Forest Service, US Fish and Wildlife Service, and National Park Service. The Michigan Hydro Relicensing Coalition and FERC are ex-officio advisory members. The MMAC Team will be responsible for the ongoing coordination and implementation of the actions required by the settlement. Members of the MMAC Team are representations of the members of the Steering Committee, as well as the Michigan Hydro Relicensing Coalition, which serves on the MMAC Team in an ex-officio advisory capacity.

III. Impacts of Settlement

The settlement agreement with Consumers Power Company was the first comprehensive settlement negotiated for the large batch of FERC licenses expiring in 1993. It has been used as a model in later negotiations, both as an example of how negotiated settlement agreements can speed the licensing process, and as an example of how positive ongoing relationships can be forged through the settlement process.

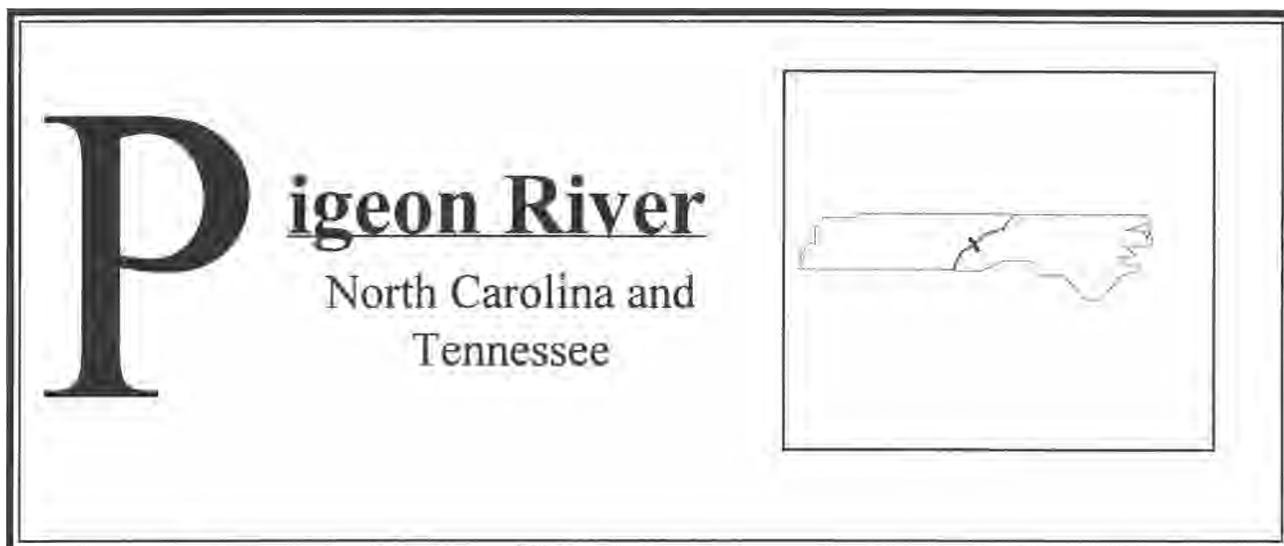
In issuing new licenses to Consumers Power, FERC did not include two provisions

included in the water quality portion of the settlement. Liquidated damages and the re-opener clause were excluded. FERC believed that the inclusion of liquidated damages in a project license is outside of its jurisdiction, and argued that the re-opener clause is already available through FERC regulations. In its order issuing the license, FERC stated that it did not object to these provisions, but that they should not be included in the license. Consumers Power has not yet agreed to comply with these provisions independent of the FERC license.

FOR MORE INFORMATION, PLEASE CONTACT:

Jim Schramm
Michigan Hydro Relicensing Coalition
Box 828
Pentwater, MI 49449
Tel/Fax: (616) 869-5487

James Truchan
Michigan Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909
Tel: (517) 373-1280
Fax: (517) 373-0381



I. Background

A. Project Description

The Pigeon River flows through Haywood County, North Carolina, and into Tennessee. The Pigeon's basin includes portions of the Great Smokey Mountains National Park and several national forests. These locations attract millions of visitors annually and support a variety of recreational activities, including **camping, hiking, fishing, swimming, hunting, horseback riding** and whitewater boating. A 1987 study suggests that a restored Pigeon River tapping its whitewater potential would add approximately \$20 million annually to the local economy.

Carolina Power and Light (CPL) owns the Walters Hydroelectric Project, located on the Pigeon. The federal license for Walters

expired on November 23, 1976, and the project operated under annual license until November 1994, when FERC issued a new forty-year license. The Walters Project consists of a massive concrete arch dam, a 340-acre reservoir (Waterville Lake), and a powerhouse with a capacity of 108 megawatts all in close proximity to several national forests and the Great Smokey Mountains National Park. Twelve miles of the Pigeon are de-watered between the dam and the powerhouse. In its application for relicensing, Carolina Power and Light did not seek to increase the Project's capacity.

The Pigeon River's water quality has been seriously degraded by Champion Paper's Canton Mill, located upstream of the Walters Dam.

B. Reasons for Settlement

Intervenors involved in negotiations concerning the relicensing of the Walters Project were: North Carolina Department of the Environment, Health and Natural Resources; Tennessee Wildlife Resources Agency (TWRA); and North Carolina Council of Trout Unlimited. All parties agreed to settlement terms encompassing recreation, water quality, and historical and cultural resources.

II. Settlement Terms

A. Recreation

1. Whitewater Releases: Beginning in May 1995, Carolina Power will provide scheduled releases from the project powerhouse. Releases will occur from 1:00 p.m. to 6:00 p.m. on two weekdays per week, and from 12:00 p.m. to 6:00 p.m. on Saturdays, from Memorial Day through Labor Day (Schedule 1). Prior to Memorial Day weekend and for two weeks after the Labor Day weekend, releases will occur from 2:00 p.m. to 6:00 p.m. on three weekdays per week (Schedule 2). Releases will be sufficient to ensure a 1,200 cfs flow at Brown's Bridge, located one mile downstream of the powerhouse.

Thirty days prior to the Saturday of Memorial Day weekend, Carolina Power will establish the particular weekdays for Schedule 1 releases after consulting with Tennessee Wildlife. There will be no fixed

weekday schedule for Schedule 2 releases, but Carolina Power will give public notice of releases for the coming week through a toll-free, pre-recorded telephone message. Schedule 1 releases and all other releases by Carolina Power from April through October will be made available on the toll-free phone line. Whitewater releases will be increased or decreased based on the number of boaters and rafters using the river.

2. Other Recreation: In addition to whitewater releases, Carolina Power will provide the following recreational improvements:

- Improvement of the canoe launch area below the project powerhouse;
- Construction of certain fishing access trails in the project area, and construction of a new one-half mile long segment of Rube Rock Trail to connect existing hiking trails;
- Improvement of picnicking, parking, playground, and restroom facilities near the project powerhouse;
- Construction of a visitor information center (kiosk) near the project powerhouse;
- A parking area and information aids (map board and signs) at the Harmon Den day use area;
- Installation of a warning siren at the project dam that will sound when releases are to be made;
- Installation of warning signs to alert the public about possible releases of water from the project dam and to

- inform them of what actions to take when the siren sounds at the dam;
- "Bear-proofing" of trash containers at recreation areas within the project boundary;
- Installation of gates across new project access roads to deter poaching of bears by hunters;
- Continuation of current policies regarding shoreline/reservoir management and use of the community building near the project powerhouse;
- Funding and design assistance totaling \$193,000 to the Forest Service to develop an overnight horse camp at Harmon Den within the Pisgah National Forest; and
- Monitoring of recreational activity on project lands and waters to determine whether existing facilities are adequately meeting recreational needs.

The settlement also authorizes FERC to require Carolina Power to develop canoe/boat portage facilities adjacent to the project reservoir after the State of North Carolina totally rescinds its 1988 fish consumption advisory for the reservoir. The portage facilities would consist of an access road, parking and turn-around areas, and a trail to the inlet areas of Stevens Creek.

B. Minimum Flows

A minimum flow of 100 cfs will be ensured at Brown's Bridge, located one mile downstream of the powerhouse.



The Pigeon River settlement requires signs such as this to be posted, warning of river level changes (photo by Kenneth Kimball, Appalachian Mountain Club).

C. Water Quality

1. Contaminated Sediment: The Canton Mill, a paper mill upstream of the Walters Hydroelectric Project, caused the sediment trapped by the dam to be contaminated with dioxin. Carolina Power will monitor concentrations of dioxin and furans in edible fillets from predatory and bottom feeding fish in the project reservoir. The monitoring will continue until otherwise ordered by FERC or until North Carolina rescinds its consumption advisory for the reservoir, whichever comes first.

Carolina Power will file a report with FERC at the end of the fourth year of the new license recommending what further action, if any, should be taken to address dioxin contamination of sediments in the reservoir. If necessary, FERC may require Carolina Power to take appropriate action to mitigate dioxin contamination.

Carolina Power will not reduce the water level in the project reservoir below an elevation of 2,232 feet to minimize the disturbance of contaminated sediment. Limited draw-downs will be allowed, as long as they do not exceed an agreed upon limit of time.

The Walters dam is equipped with a low-level outlet structure which is controlled by a Johnson valve on the downstream side of the dam. Operation of the Johnson valve could cause erosion and resuspension of contaminated bottom sediments, which could be released downstream. Use of the Johnson valve is prohibited unless ordered by FERC or agreed to in writing by North Carolina and TWRA with the prior approval of FERC.

2. Dissolved Oxygen: Carolina Power will consult with TWRA and prepare a plan for monitoring dissolved oxygen levels in the Pigeon River from June 1 through September 30 of each year. The monitoring site is to be located approximately one mile downstream of the Project powerhouse. The plan will include the method and frequency of the monitoring, and a schedule for submitting the

results to FERC and TWRA. Carolina Power's monitoring of tailrace dissolved oxygen will assess the magnitude and duration of any violations of the state standard for dissolved oxygen, and will determine whether natural aeration is sufficient to maintain dissolved oxygen levels at or above the state standard.

D. Pigeon River Fund

Settlement Highlights

- ☒ Water quality protections
- ☒ Improved recreational facilities
- ☒ Whitewater releases

Carolina Power agreed to release water from the project reservoir into the twelve mile bypassed reach after the lake water quality had met water quality criteria established by Carolina Power and resource agencies. Until those releases can be made, Carolina Power will make contributions to the Pigeon River Fund. This Fund will be used to support projects and activities that provide direct benefits to surface water quality, fish and wildlife habitat, fishery management, and public access in or near the Pigeon River and French Broad River Basins.

An initial contribution of \$1 million will be made by Carolina Power, and annual payments with the following schedule will be made: (1) \$100,000 in the first year; (2) for years two through five, the previous years payment adjusted by the U.S. Bureau of Labor Statistics Consumer Price Index; and (3) for year six, \$290,000. Payments to the Fund will conclude after the onset of releases

into the bypassed reach or year seven of the license, whichever comes first.

North Carolina has agreed to not seek a FERC order requiring minimum flow releases for at least ten years after license issuance. If the agreed-upon water quality and biological criteria are met after the ten year period, North Carolina may seek an order from FERC requiring releases from the project of not more than 30 cfs during May and June of each year, and 20 cfs during the remainder of the year.

E. Cultural Resources

Carolina Power has agreed to implement the provisions of a programmatic agreement among FERC Staff, the Advisory Council on Historic Preservation, and the North Carolina State Historic Preservation Officer for managing historic properties that may be affected by the issuance of a new license. The programmatic agreement, which was executed on July 11, 1994, stipulates the terms and conditions for:

- Carolina Power's development of a cultural resources management plan;
- How the management plan is to be reviewed and implemented;
- The interim treatment of historic properties;
- How any disputes regarding the programmatic agreement and the resulting management plan are to be resolved; and

- Provisions for amending and terminating the programmatic agreement.

III. Impacts of Settlement

Since the negotiated settlement and the initiation of recreational flows, four commercial outfitters have begun offering trips on the Pigeon. Outfitters estimate that 10,000 to 15,000 paddlers will pay at least \$35 each to boat the Pigeon in 1995, bringing more than \$500,000 in direct revenues to the area. A recent study suggests that the potential whitewater industry on a restored Pigeon River should add roughly \$20 million to the local economy.

The dam relicensing process and increased recreational use of the Pigeon has also brought greater attention and improvements to the long standing water quality problems on the Pigeon. The Canton Mill's discolored discharges into the Pigeon have been cut by two-thirds, bringing the rate down to 115,000 lbs/day. Complete restoration of the river's water quality, color, odor and aesthetics, however, will require additional work.

**FOR MORE INFORMATION, PLEASE
CONTACT:**

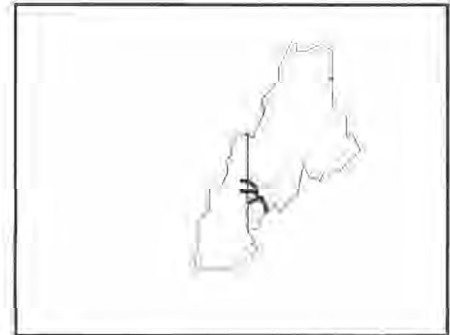
Joe Cooley
National Park Service
75 Spring Street, SW
Suite 1020
Atlanta, GA 30303
Tel: (404) 331-5838
Fax: (404) 730-3233
[e-mail: j_cooley@nps.gov](mailto:j_cooley@nps.gov)

George Oliver
Carolina Power and Light
Box 1551
Raleigh, NC 27602
Tel: (919) 546-4189
Fax: (919) 546-4171

Saco River



Maine and New Hampshire



I. Background

A. Project Description

The Saco River rolls out of the White Mountains of northern New Hampshire through southern Maine into the Atlantic Ocean, draining 1,697 square miles. Over its 125 miles, the river drops in elevation a total of 1,898 feet. Hydropower developers have capitalized on this drop by building 10 dams on the mainstem Saco, and seven more on tributaries.

The Saco once supported large runs of Atlantic salmon, shad and alewives. However, because all but two of the Saco's dams are without fish passage, most of the native migrating fish populations have been extirpated. The mainstem of the Saco accounts for nearly 52% of the potential salmon habitat in Maine, and numbers of Atlantic salmon have returned to the lower river in recent years.

The Saco river is widely known to fishing enthusiasts for its Atlantic and landlocked salmon; brown, brook and rainbow trout; small and largemouth bass; and black crappie. As the southern-most of the major Maine rivers, the Saco provides excellent fishery opportunities a relatively short drive from Boston and Portland. Although highly developed hydroelectrically, the Saco is one of the few river basins in New England to survive industrial development with little impacts on water quality.

Central Maine Power Company (CMP) operates six hydroelectric projects on the Saco. The projects, in order from downstream to upstream, are: Cataract, Skelton, Bar Mills, West Buxton, Bonny Eagle, and Hiram. A seventh project, Swans Falls, is owned by Swans Falls Corporation, and is the upper-most dam on the Saco. Swans Falls is not federally licensed, and is

currently seeking a license exemption with FERC. Each project on the Saco is licensed by FERC separately, and Skelton and Bonny Eagle are currently seeking new licenses. Cataract and West Buxton received new licenses in the mid 1980s, and Hiram and Bar Mills have licenses that expire in 2002 and 2004 respectively.

B. Reasons for Settlement

CMP hosted a series of meetings to negotiate a plan for the installation of fish passage facilities on the mainstem of the Saco River. Anadromous fish including Atlantic salmon, American shad and river herring are among the fish populations that will benefit from passage facilities. A settlement regarding fish passage was signed in June, 1994. No other license terms were negotiated in the settlement.

Participants involved in the settlement to install fish passage facilities at Saco dams include: CMP, Swans Fall Corporation, the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, the Maine Atlantic Sea Run Salmon Commission, the Maine Department of Marine Resources, the Maine Department of Inland Fisheries and Wildlife, the Maine Department of Environmental Protection, the Maine State Planning Office, the Cities of Saco and Biddeford, the Saco River Salmon Club, Trout Unlimited, the Maine Council of Trout Unlimited, the Atlantic Salmon Federation, the Maine Council of Atlantic Salmon Federation, American Rivers, the New Hampshire Department of Fish and Game, the Biddeford-Saco Water Company, and the



The Saco River settlement seeks to restore to the river historically abundant Atlantic salmon populations (photo courtesy of American Rivers).

Maine Energy Recovery Company. All parties agreed to terms that will provide fish passage on the Saco, with the goal of restoring anadromous fish populations.

II. Settlement Terms

A. Cataract Project

The Cataract Project consists of the Springs, Bradbury, East Channel and West Channel dams. The East and West Channel dams are peaking facilities, and are already equipped with Denil ladder fish passage. Springs and Bradbury dams do not have any generation capabilities, and are smaller than the East and West Channel dams.

CMP will install a fish lift/lock system at the Springs and Bradbury dams. The 1994 season shall be used for telemetry and engineering and flow studies. Either Springs or Bradbury dam will be chosen for fish passage construction beginning in 1995, with facility completion and operation by May 1, 1996. Construction of the upstream facility at the other dam will be completed and operational by May 1, 1997, at the latest. In April 1995, CMP requested that FERC extend the time required for completion of the first passage system, proposing to complete both systems by May 1997. As mitigation for this delay, CMP provided \$18,500 to support the Saco River Salmon Club's salmon hatchery operation. All signatories agreed to this proposal.

CMP shall trap and truck Atlantic salmon, shad and river herring from the East Channel fish lift to a location above Bonny Eagle dam in accordance with the specifications of the state and federal fisheries agencies. Depending on the numbers of returning fish, some salmon may be trucked as early as 1994.

Early in the negotiation process, CMP offered to breach the Springs and Bradbury dams for fish passage mitigation. Because of infrastructure costs that would have been associated with breach or removal, the adjacent cities strongly opposed CMP's proposition, causing CMP and the intervenors to rethink their positions and

introduce the aforementioned fish passage system.

B. Skelton Project

The Skelton Project includes one peaking power dam. CMP will install upstream and downstream fish passage facilities for salmon, shad and river herring. Facilities will be operational within three years of license acceptance or **May 1, 1998**, whichever occurs later.

This schedule is expected to correlate with the returning run of shad and river herring from the 1993 spawning season. A fish lift utilizing trap and truck methodology will be used, and decisions regarding the number and destination of fish to be trucked will be made by the appropriate state and federal fisheries agencies.

C. Bar Mills, West Buxton, Bonny Eagle, Hiram and Swans Falls Projects

1. Downstream Passage: These projects have one peaking dam each, with the exception of Hiram, which operates in run-of-river mode most of the time. CMP will construct permanent downstream fish passage facilities at Bonny Eagle, Bar Mills and West Buxton within two years of acceptance of each license. The need for permanent downstream passage at Hiram and Swans

Settlement Highlights

- ☞ Upstream and downstream fish passage
- ☞ Coordinated passage at all seven dams

Falls depends on the presence of fish at these locations. This could be achieved through either stocking or trucking, with the cooperation of state and federal fisheries agencies in Maine and New Hampshire. Permanent downstream passage will be provided at each of the dams within two years after stocking or trucking commences. Although Swans Falls is not required to provide downstream passage until 2011, the presence of fish at the dam could allow this date to be accelerated.

2. Upstream Passage: The first upstream passage at these dams will be operational no earlier than May 1, 2005, and will be developed based on prior assessments of fish present at the dams. In January of 1995, state and federal fisheries agencies developed assessment criteria to be used in determining the need for, timing, and design of interim



The presence of fish returning to the Hiram Dam will determine the need for upstream fish passage (photo courtesy of American Rivers).

and permanent upstream fish passage at these projects. The upstream fish passage process is formulated in a four year cycle of planning, data collection and assessment. A report will be developed at the end of the cycle that answers the following questions:

- Are the management goals and objectives stated at the beginning of the four year cycle still current?
- What is the present status of anadromous fish populations on the Saco River?
- Is progress toward the management goals and objectives being made?
- Is the rate of progress as expected?
- What conclusions can be drawn regarding the need, timing, and design for constructing new upstream fish passage facilities at Bar Mills, West Buxton, Bonny Eagle, Hiram and Swans Falls?

The first assessment cycle begins in 1996 and ends with an assessment report in 2000. Additional cycles will be completed in 2003, 2007 and 2011. The conclusions found in the assessment reports will reflect consensus decisions by all parties, or the discretion of the fisheries agencies if conclusions cannot be agreed upon. The installation of passage will not be based solely upon numbers of returning fish because of inconsistent and unpredictable

variations in these values. Assessments will determine the need, design and schedule for additional upstream passage facilities, however installation will not occur at multiple projects within two years of each other. Swans Falls is an exception, which may be scheduled for simultaneous completion with Hiram.

III. Impacts of Settlement

With numbers of Atlantic salmon returning to the lower Saco, there is a strong interest among anglers and resource agencies to establish an effective restoration program. Fish passage at CMP's hydropower dams is a key component to this restoration program; without passage, much of the 52% of Maine's key salmon habitat will be unreachable.

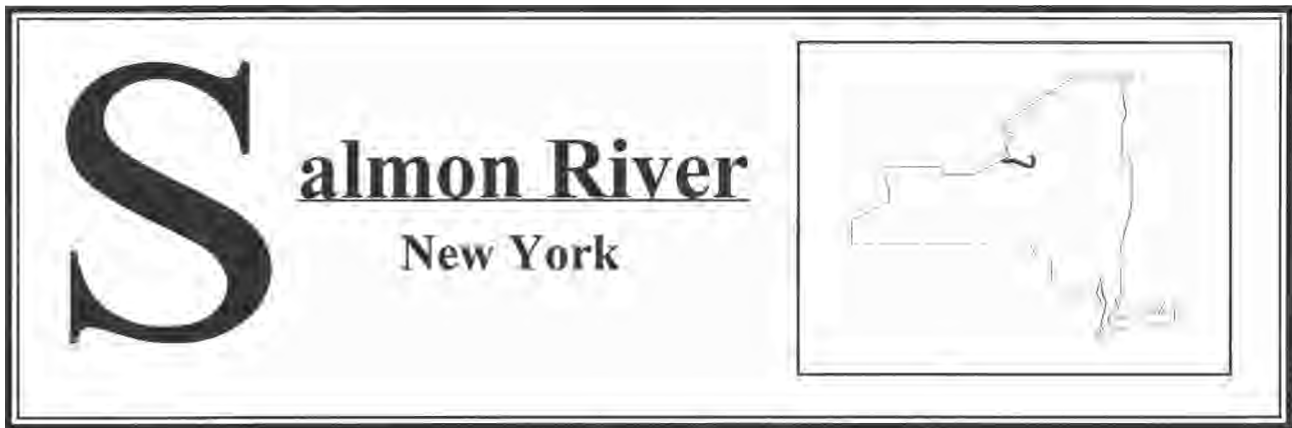
FERC has issued a Draft Environmental Impact Statement (DEIS) that encompasses:

(a) The relicensing of Skelton and Bonny Eagle; (b) An amendment to existing licenses on the Saco for the installation of fishways; and (c) An exemption from federal license for Swans Falls that requires fish passage installation. This DEIS endorses the fish passage terms provided by the agreement.

FOR MORE INFORMATION, PLEASE CONTACT:

Ed Laing
Saco River Salmon Club
289 Pine St.
S. Portland, ME 04106
Tel: (207) 767-2309
Fax: (207) 622-4343

Wendy Bley
Central Maine Power
83 Edison Dr.
Augusta, ME 04336
Tel: (207) 626-9600
Fax: (207) 626-9633



I. Background

A. Project Description

The Salmon River originates on the Tug Hill Plateau and drops 1,550 feet as it flows approximately fifty miles into Lake Ontario. The Salmon drains almost 300 square miles and is the second largest tributary of Lake Ontario. The lower Salmon boasts one of the most intensively utilized trophy trout and salmon fisheries in the Northeast. The river corridor is generally undeveloped, rural and wooded, with a remarkable diversity of wetlands, fish, waterfowl and raptors.

The Salmon River is an important regional resource. Formerly of "world class" quality, the river's fishery has great ecological significance because salmonids that utilize the **Salmon River** supplement fish populations throughout Lake Ontario and its tributaries. Recent trends in fishing use also indicate that the Salmon River has become very important to the region's residents. From 1973 to 1989, fishing activity on the

Salmon has increased 36-fold to more than 180,000 fishing days per year.

The Niagara Mohawk Power Company is seeking an original license to operate the Bennetts Bridge and Lighthouse Hill dams on the Salmon River, which are located eighteen and seventeen miles from the confluence with Lake Ontario, respectively. These peaking dams have previously functioned without a federal license. However, the navigation of logging vessels on the Salmon mandated Niagara Mohawk to apply for a FERC license. Niagara Mohawk filed a license application with FERC on April 28, 1993. These dams have an installed capacity of 39.7 megawatts, and Niagara Mohawk proposes to install an additional 2.15 megawatt turbine generator in the Lighthouse Hill powerhouse.

B. Reasons for Settlement

As formerly discussed in the summary of the Beaver River settlement, negotiations with

Niagara Mohawk regarding its licensing applications in New York have been spurred on by litigation in State Court regarding the scope of the State of New York's authority to place conditions on FERC licenses pursuant to Section 401 of the Clean Water Act. All parties have recognized the benefits of avoiding additional litigation, and have requested a stay of the litigation pending resolution of negotiations.

A settlement agreement regarding operations at Niagara Mohawk's Salmon River dams was signed and submitted to FERC in



The Salmon River settlement will help restore a popular trout and salmon fishery (photo by Tim Palmer).

January, 1994. The New York State Department of Environmental Conservation (NYSDEC) issued its water quality certification for the Salmon River Project with terms consistent with the settlement. The settlement was listed as the "preferred alternative" in FERC's Draft Environmental Impact Statement.

Parties involved in the negotiation for Niagara Mohawk's new license include: NYSDEC, New York Rivers United, Niagara Mohawk, the Adirondack Mountain Club and Trout Unlimited. All participants agreed to measures that address base flows, ramping, whitewater releases, fishing and recreational access, fish protection, fish passage, and monitoring.

II. Settlement Terms

A. Minimum Flows

A continual base flow for the project (released below the powerhouse) will be provided as described in the water budget model, a comprehensive water-issue document developed in cooperation by Niagara Mohawk, the American Whitewater Affiliation, NYSDEC, New York Rivers United, and the U.S. Fish and Wildlife Service. A minimum flow for the project was established to form a basis for Atlantic salmon restoration. A Flow Management Advisory Team (FMAT), consisting of representatives from state and federal agencies, local interest groups and Niagara Mohawk will be established to monitor

changing conditions that may affect river flows. If deemed necessary, the FMAT will request to FERC that changes in flows, releases and other water-related issues be considered.

Lighthouse Hill dam will be utilized as a store and release facility that operates in a daily re-regulating mode. Flows below 450 cfs will be made through a new base flow unit that will be located in the spare bay of the Lighthouse Hill powerhouse.

Downstream of the Great Lakes Fish Hatchery (located downstream of the dams), a minimum flow of 285 cfs will be provided from January to April. From May through August, a minimum flow of 185 cfs will be provided, and a minimum flow of 335 cfs will be provided from September through December. Of the required minimum flow, 22 cfs shall be provided on a year-round basis from the Great Lakes Fish Hatchery.

Minimum flows in the Bennetts Bridge dam bypassed reach will be 20 cfs from July through September and 7 cfs for the remainder of the year. The agreement provides no provisions for minimum flow releases into the Lighthouse Hill bypassed reach.

B. Recreation

1. Whitewater Releases: Releases for whitewater activities will be made at least

five weekends per year. The releases are: weekend four in June (400 cfs); weekends two and four in July (750 cfs); weekend two in August (750 cfs); and weekend one in September (750 cfs). According to NYSDEC, all special, large releases should be separated by at least two weeks and not be made in the third and fourth weekends of August to prevent the premature migration of salmon.

2. Ramping: Scheduled releases from Lighthouse Hill dam will be ramped, with gradual releases of stored water in increments of 400 cfs. However, when the base flow is 185 cfs, the first increment up will be 200 cfs and each subsequent increment will be 400 cfs. Up-ramping will occur on a 24-hour basis. Down-ramping will occur on a 12-hour basis.

3. Recreational Access: Fishing access at Lighthouse Hill reservoir will be provided at the existing Lighthouse Hill day-use area and at the proposed Hogback Road campground. In addition, car-top boat and canoe access, parking, picnic tables and trails at the proposed Hogback Road campground will be provided at Lighthouse Hill Reservoir.

The Falls Road day use area at the west end of the Salmon River reservoir will remain open to the public. A boat launch will be installed at the Redfield area, and existing fishing access will be enhanced by improving

Settlement Highlights

- ☑ Aesthetic improvements
- ☑ Land protection
- ☑ Fisheries enhancement

access trails and installing signs on the south shore.

C. Aesthetics

The top of the Salmon River Falls will be modified with natural ledge material to distribute the flow over the 110 foot falls in a veil formation, producing a more dramatic spectacle. Natural buffer zones will be provided to screen proposed recreational facilities from view by waterway users, and selected trees will be cleared to open up scenic views of the waterway. Evergreen trees will be planted along Country Route 22 to screen views of the Lighthouse Hill powerhouse, substation and associated facilities.

D. Fish Protection

One-inch clear spacing trashracks will be provided at the Lighthouse Hill dam within four years of receiving the license. At Bennetts Bridge dam, Niagara Mohawk will install 1-inch clear trashracks when the existing 1.5-inch trashracks need to be replaced

E. Reservoir Management

Niagara Mohawk will reduce the March drawdown of the Salmon River Reservoir, maintain a higher and more stable reservoir level May through July, and increase late summer reservoir elevations an average of four feet over historical levels. Further modifications of Salmon River and Lighthouse Hill Reservoirs will be initiated to enhance wetlands and dependant wildlife.

F. Land Management

Through the Comprehensive Land Management Program for the Salmon River Properties, Niagara Mohawk will provide to the NYSDEC: (1) permanent easements to all NYSDEC fishing access locations along the Salmon River downstream of the Lighthouse Hill dam; (2) fishing easements along most of Niagara Mohawk's property on the lower Salmon River downstream of the Lighthouse Hill dam; (3) a 200-foot-wide conservation easement along the downstream river corridor; and (4) other easements such that a trail system can be developed along the entire river corridor. Niagara Mohawk will sell to the NYSDEC: (1) the area south of the Salmon River Reservoir; (2) the area surrounding and including the Salmon River Falls; and (3) the existing angler parking areas and one additional area downstream of the Lighthouse Hill dam. These properties are outside the FERC project boundaries.

G. Water Use Payments

Niagara Mohawk receives annual payments (approximately \$20,000 per year) from the NYSDEC for water withdrawn from the Lighthouse Hill reservoir and used at the Great Lakes Fish Hatchery. Niagara Mohawk will manage this money in support of NYSDEC's proposed land management plan for the Salmon River area. The money will be used by the NYSDEC for the proposed trail and park system within the Salmon River corridor.

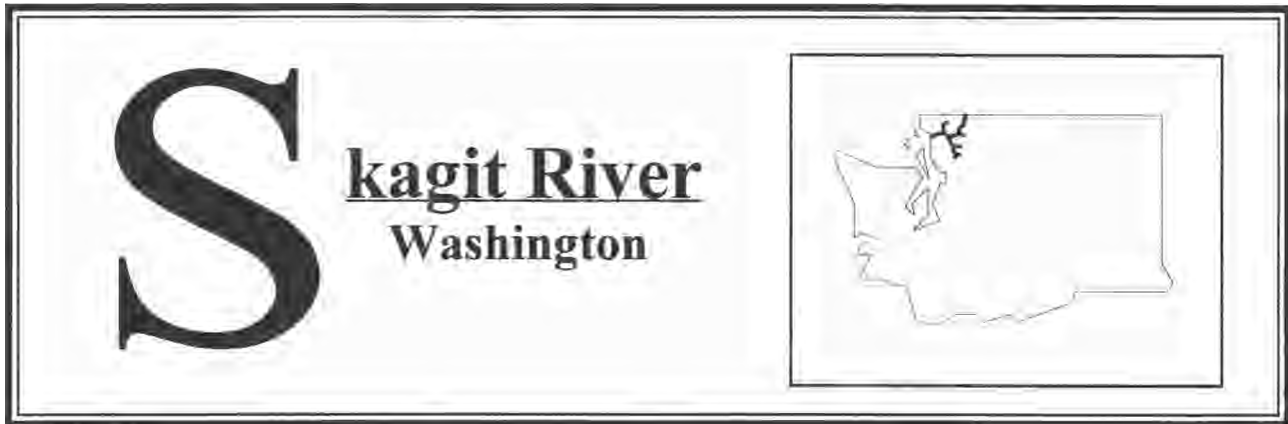
III. Impacts of Settlement

The Salmon River settlement marked the first time in New York State that various interests established a framework for cooperation over the full length of a license term. Fishery enhancements in the Salmon River gained through the licensing process will provide benefits to the salmonid fishery throughout its entire range. The settlement also was a success in terms of land conservation. A beautiful, productive river corridor more than 11 miles long will see permanent protection through the transfer of conservation easements to the state. Miles of shoreline and hundreds of acres surrounding the reservoir will receive protection when added to an adjacent state wildlife management area.

FOR MORE INFORMATION, PLEASE CONTACT:

Bruce Carpenter
New York Rivers United
199 Liberty Plaza
Rome, New York 13440
Tel: (315) 339-2097
Fax: (315) 339-6028
E-Mail : nyru@igc . apc . org

Jeff Sama
New York Department of
Environmental Conservation
50 Wolf Road
Albany, NY 12233-1750
Tel: (518) 457-2224
Fax: (518) 457-5965



I. Background

A. Project Description

The Skagit River is a large drainage located in the northwest corner of Washington, approximately 100 miles from the city of Seattle. It originates in British Columbia and flows southwest for more than 120 miles to Skagit Bay and Rosario Strait in Puget Sound. Located within the boundaries of Ross Lake Recreation Area, the Skagit River supports a multitude of resources including major runs of anadromous fish, bald eagles, and several endangered species. The Recreation Area is managed by the Park Service, and is surrounded by North Cascades National Park and several National Forests. The Skagit is home to several species of salmon, a major population of bald eagles, and other wildlife. Visitors come to the area from across the Pacific Northwest for fishing, boating and nature study. The Skagit River is also the treaty fishing grounds of three Native American tribes.

The City of Seattle is the licensee of the Skagit River Hydroelectric Project, which includes, from downstream to upstream, the Gorge, Diablo and Ross dams, with their associated facilities and transmission lines. Gorge dam is operated as a run-of-river project, has a capacity of 207 megawatts, and de-waters a 2.7 mile bypassed reach. Diablo has a capacity of 122.4 megawatts, and is a run-of-river facility with limited peaking operation and re-regulating capacity. Ross dam is a peaking facility, with a capacity of 360 megawatts. In addition to providing approximately one quarter of Seattle's electricity, the project is also a source of flood control storage, recreation, and downstream flow regulation for the protection of anadromous fish. The City operates the three dams under a single license that expired in 1977. The dams have been operating pursuant to annual FERC licenses since 1977.

B. Reasons for Settlement

The Skagit River settlement was motivated by several disputes over flow releases for fish passage in the 1970's. Intervenors and the City of Seattle, feeling that they were in the best positions to frame the Skagit River's future, engaged in a series of interim agreements followed by a two year negotiation process that resulted in a comprehensive settlement package.

The value of the Skagit settlement is estimated to be in the range of \$50 to 100 million. The settlements were submitted to FERC in April of 1991, and the new license was issued on May 16, 1995. The license excludes several of the settlement provisions, including all wildlife mitigation. It is currently under appeal by all parties.

Parties involved in the negotiation regarding terms for the City of Seattle's relicensing application include: the City of Seattle, National Park Service, Fish and Wildlife Service, Bureau of Indian Affairs, Forest Service, National Marine Fisheries Service, the Upper Skagit Tribe, the Sauk-Suiattle Tribe, the Swinomish Indian Tribal Community, the Washington Department of Wildlife, and the North Cascades Conservation Council. All parties agreed upon separate but related settlements for fisheries, wildlife, recreation and aesthetics,

erosion control, cultural resources (archaeological and historic resources) and traditional cultural properties.

II. Settlement Terms

A. Fisheries

The fisheries agreement between the City and other parties consists of an anadromous fish

Settlement Highlights

- ▣ Significant recreation improvements
- ▣ River flows to protect migrating fish
- ▣ Wildlife habitat protection
- ▣ Cultural resource protection

flow plan and the anadromous and resident fish non-flow plan. The City will establish a new environmental staff position dedicated **primarily to** providing general oversight and direction concerning the implementation of these plans.

The flow plan's primary purpose is to mitigate the effects of project operations on salmon and steelhead. Specifics of the plan include:

- Regulating spawning and incubation flows for the purpose of protecting redds (spawning nests) and offspring;
- Minimum flows with daily and seasonal flow fluctuations to protect salmon and steelhead fry;
- Field monitoring to determine the alternative **spawning and fry** protection periods;
- Compliance requirements with flow monitoring and recording; and

- The preparation of **semi-annual** compliance reports by the City.

During the spawning period of each salmon species, daily spawning flows shall not exceed 4,500 cfs for chinook salmon, 4,000 cfs for pink salmon, and 4,600 cfs for chum salmon unless: (a) the flow forecast made by the City shows a sufficient volume of water will be available to sustain a higher incubation flow, thereby permitting a higher spawning flow; or (b) uncontrollable flow conditions are present.

Steelhead spawning flows shall be less than the following amounts: 5,000 cfs for March steelhead, 5,000 cfs for April steelhead, and 4,000 for May through June 15 steelhead. These amounts can be altered if the forecasted inflow and storage is great enough to provide incubation flows for higher season spawning flows. Flows for fry are tied to spawning flow levels and other variables.

The non-flow plan is intended to address unmitigated fish impacts and provide a measure of improvement. The City will provide a total of \$6,320,000 (all monetary values are in 1990 dollars) for support and implementation of the following programs: steelhead production, chinook salmon research, off-channel chum salmon habitat



The Skagit settlement includes several provisions for protection of wildlife habitat (photo by Tim Palmer).

development and improvement, creation of additional off-channel salmon spawning and rearing habitat, instream or off-channel habitat improvement, and sediment reduction measures on the Skagit or its tributaries. Additionally, resident trout protection and production will be enhanced by removal of tributary migration barriers in Ross, Diablo and Gorge reservoirs, and captive broodstock supplementation designated for the Skagit River and its tributaries above Gorge dam.

B. Wildlife

A wildlife habitat protection and management plan is part of the settlement agreement. To provide **direction concerning plan** implementation, the City will introduce a new environmental staff position for wildlife purposes, and **develop a Wildlife Management Review Committee.**

A total of \$17 million will be made available for the acquisition and enhancement of wildlife habitat. Lands have been selected that possess riparian areas and corridors, wetlands, and mature forest communities; have eagle usage or provide elk winter range; and are adjacent to other protected lands. An annual payment of \$50,000 will be provided by the City for research and studies in the North Cascades. This wildlife and ecosystem research will enhance the knowledge and practice of wildlife protection and management in the project area and Ross Lake National Recreation Area. Another \$20,000 per year will be paid for long-term monitoring of wildlife and environmental resources in the North Cascades National Park Service Complex.

C. Cultural Resources

1. Archaeological Resources: An estimated \$1,465,000 will be made available by the City for the purpose of funding archaeological measures and programs. The City will develop an archaeological resources plan in cooperation with the National Park Service, the Washington State Historic Preservation Officer, the Upper Skagit Tribe, the Sauk-Suiattle Tribe, and the Swinomish Indian Tribal Community. For resources deemed eligible by the archaeological resources plan, a choice of measures, methods and monetary amounts will be negotiated by the parties and the Washington State Historic Preservation Officer. The plan will be developed and implemented in concert with the local Indian Tribal Community.

2. Historic Resources: The historic resources plan defines a set of standards and procedures for the preservation and treatment of historic structures and resources at the project. Also, the City will develop a set of Skagit maintenance guidelines to provide more detailed, resource and task-specific guidance for the protection and maintenance of historic resources.

Several program measures will be initiated to enhance the understanding and appreciation of the historic resources in the area. A cooperative program will be developed jointly by the City and the National Park Service for training in preservation techniques, and to provide continuing information and assistance in these techniques and issues. Additional historic information will be integrated into the Skagit Tours Program, and a self-guided walking tour and brochure will be developed for the Newhalem area.

The City will fund studies to complete an inventory of traditional cultural properties in the project area and it will spend up to \$250,000 on the inventory, with possible additional contributions from affected federal land management agencies, primarily the National Park Service. The City will also fund cultural activities of the three local tribes in lieu of on-site mitigation measures. Each tribe will receive a total of \$1,233,338 over an eight year period.

Further mitigation for damage to historic and cultural resources include studies of historic buildings, review and reassessment of

exhibits, and production of interpretive brochures.

D. Recreation and Aesthetics

The total cost of the settlement's recreation plan over the license period is approximately \$17 million. The plan will allow for the continuation of opportunities and services already in place, fund all or part of a number of recreational facilities, and fund a number of measures to mitigate for the impacts of Project operations on reservoirs.

1. Continuing Measures: The City will continue to provide ongoing recreation services. Examples include:

- Conducting Skagit Tours, serving 10,000 persons per year;



The settlement provides for significant recreation improvements (photo by Verne Huser).

- Operating the Newhalem visitor contact station, including rehabilitation of the facility;
- Operating the **Diablo lake** tugboat/ferry service, which provides access to Ross Lake and portage across the lake for canoes and other small boats; and
- Maintaining Ladder Creek Falls Trail behind the Gorge powerhouse.

2. New Recreational Facilities: The most significant new facility under the plan is a North Cascades Environmental Learning Center proposed for either Diablo Lake or a site next to the National Park Service Visitor Center. The Learning Center will have an initial overnight capacity of 40 students and 12 faculty, with the possibility for expansion to an overnight capacity of 60 students and 18 faculty. The City will build the Learning Center on federal land, and work cooperatively with the National Park Service in support of operations.

As part of the City's support of the North Cascades Environmental Learning Center, an annual payment of \$20,000 will be paid by the City to the Center **to further the development of public understanding of project management and wildlife issues in the project area and the North Cascades.**

Additional recreation enhancements include a Goodell Creek raft site, several boat access sites, and trails. All of these measures are scheduled to begin by year seven of the new license period.

3. Additional Measures: A number of measures to mitigate reservoir impacts caused by project operations will be implemented by the City. In designated locations, ramps will be extended to a lower elevation, increasing the ability of boaters to access Ross Lake. Boat-in campgrounds at Ross Lake will be more accessible after improvement of docking facilities. Diablo and Gorge Lakes will also have increased accessibility after boat ramp facilities are improved.

The City will also provide funding for the growth of recreational use. Recreation use and needs assessments will be conducted every five years, specified landscape will be revegetated, paving and landscaping will occur at Newhalem for use by recreational vehicles, visual quality will be improved by vegetation in particular areas, and Ross Lake will be refilled as early as possible after April 15 to facilitate the recreational season.

E. Erosion Control

The National Park Service will have the lead role in most erosion control work and monitoring, primarily at reservoir shoreline sites. The City will construct greenhouse facilities and institute a plant propagation program to supply plant stock for vegetation at erosion control sites, and will establish a

new environmental staff position partly dedicated to erosion control purposes. An erosion control plan will be used to designate sites in particular need of mitigation. Erosion rates and processes will be monitored at sites where there is a high potential for large slump movements of soils or where a high rate of erosion would be especially undesirable (*e.g.*, osprey nesting trees). In key locations, vegetation, logs, rock walls and cribbing will be used to curtail erosion.

The City will provide \$845,000 for erosion control work at sites specified in the erosion control plan during the first nine years following license acceptance. An additional \$500,000 will be provided for erosion control measures at non-plan designated sites, and a portion of the sum may be used to finish work at erosion control plan sites, if need be. The City will also fund erosion control at several high priority trail and campground sites to a maximum of \$99,000 in the years before the license is issued.

III. Impacts of Settlement

In the license issued by FERC in May 1994 for the Skagit Project, FERC failed to incorporate the Skagit settlements verbatim in the form of special license conditions, as the parties had suggested. Instead, it summarized complicated settlement provisions into a few sentences, and omitted much of the parties' interests and carefully developed language. In addition, some

settlement provisions regarding land acquisitions outside the project site for wildlife, recreation and aesthetic mitigation were not included, on the basis that they were "too remote," and therefore out of FERC's jurisdiction.

The license will not include the settlement's provisions for the protection of wildlife habitat, because FERC's Environmental Assessment concluded that relicensing the project will not affect elk, and because the mitigation lands are not located within the project area. Further wildlife agreements that occur outside the project boundaries, including monitoring within North Cascades National Park, and inventory and planning of bald eagle and other wildlife habitat are not included in the FERC license on "non-jurisdictional" grounds.

The license will also not include six recreation mitigation sites that are between 22 and 45 miles outside of the project boundary.

FERC stated in its order issuing the license that it has no objection to any of the excluded terms, and that the parties are free to carry out these provisions of their agreement. This ruling is under appeal by all parties, who advocate FERC approval of the settlements in full.

FOR MORE INFORMATION, PLEASE CONTACT:

Lorri Bodi
American Rivers, Northwest Office
400 East Pine Street
Seattle, WA 98122
Tel: (206) 323-8186
Fax: (206) 323-8188
[E-mail: arnw@igc.apc.org](mailto:arnw@igc.apc.org)

Keith Kurko
Seattle Water
Watershed Management
19901 Cedar Falls Road, SE
North Bend, WA 98045
Tel: (206) 233-1516
Fax: (206) 233-1527
[E-mail: keith.kurko@ci.seattle.wa.us](mailto:keith.kurko@ci.seattle.wa.us)



Conclusion

Conclusion cover photo by Tim Palmer.

Within the last decade, monumental progress has been made in the effort to preserve America's rivers from the detrimental effects of hydropower dams. **Genuine** conservation and recreation improvements have been realized through settlement agreements and traditional FERC relicensings. For example, in just the nine settlements described above, fish passage facilities were ensured at 30 dams, recreation accesses and facilities were improved or installed on ten rivers, and whitewater releases were guaranteed from eight different locations.

A. Transforming the Relicensing Process

The traditional FERC relicensing process is slowly **transforming into a more** environmentally conscious procedure through the constant efforts of concerned citizens, resource agencies, hydropower companies, and intervening groups. FERC has begun to include several conservation and recreation enhancements as common mitigation conditions in its licenses (*i.e.*, reservoir fluctuation limitations, provisions for instream flow, and recreation access and facilities). Just a decade ago, many of these provisions would have been omitted.

B. Spreading Settlement Successes

As broad-minded as FERC's traditional relicensing process is becoming, the most progressive mitigation is currently being attained through settlement agreements. The advantage of a productive settlement process is that all parties can benefit from the agreement. Settlement can reduce the length of the relicensing process; riverine communities receive economic gains from the mitigation (such as fisheries enhancement and recreation industry opportunities); the river **benefits from conservation** improvements; and both the dam owner and the intervening parties receive positive publicity if the negotiations run smoothly.

Today, settlement agreements are still a relatively new phenomenon, and an obvious learning curve is evident upon comparison of the oldest to the most recent settlements. The most progressive, inventive, and far-reaching mitigation has been attained in the later settlements where the experience of previous settlements was employed.

As the word of successful settlements and their advantages spreads, they inevitably will become still more prevalent. The lessons learned in past relicensings can be instrumental tools for new negotiators and intervenors. Above all else, all parties in traditional relicensings or settlement negotiations must be creative and flexible. A

willingness to compromise and a cooperative attitude **among resource agencies**, conservation and recreation groups, and dam owners are essential. Settlements, for example, appear to work best if all participating environmental and recreational groups can speak with one voice, organizing a list of desired conditions before beginning negotiations with the dam owner. In addition, all parties need to become familiar with the scientific and ecological processes of river systems, as well as the operation, maintenance, and construction of hydropower dams. In summary, no party to a settlement or relicensing should expect the impossible; it is wisest to work with what you have to create the best package for a particular river's needs.

C. Looking Ahead

The future of hydropower dam relicensing is constantly advancing and transforming. One trend developing currently is to go beyond settlement negotiations to a more inclusive and cooperative relicensing effort among interested parties that is commenced years in advance of the license expiration. In these cooperative processes, conservation and recreation groups, resource agencies and dam

owners work closely together from the beginning of the relicensing process, jointly outlining studies, selecting contractors, and designing project operations and mitigation. The goals of this cooperative approach are to conduct environmental analysis early on in the relicensing process and, by developing consensus early on as to the needed mitigation, avoid later delays and (possibly) costly studies.

Within the next decade, the focus of hydropower dam relicensing will be moving further west, where bigger and more extensive projects have been constructed. This shift will provide increased opportunities for improving the quality of our nation's rivers, and we must be prepared for the challenge. The future of America's rivers is contingent on the success or failure of concerned individuals and parties to secure mitigation for the proper operation, construction, and maintenance of hydroelectric dams. Through cooperation, communication, and perseverance, we can ensure that the rivers of the country flow with life and are accessible to the public so that they may be enjoyed by generations to come.

APPENDIX

Handbook Collaborators

American Rivers

American Rivers is a national conservation organization with a mission of preserving and restoring America's river systems, and fostering a river stewardship ethic. American Rivers has a national membership of over 15,000 individuals. The organization is based in Washington, D.C. with regional offices in Arizona and Washington.

Since its inception in 1973, American Rivers has helped to preserve more than 20,000 miles of nationally significant rivers and over 5 million acres of riverside lands. While addressing river policy issues, American Rivers staff works cooperatively with conservation groups, local citizens and various levels of governments. The organization focuses its conservation program in several areas: nationally significant rivers, hydropower dam reform, endangered aquatic species, floodplain use reform, Western water issues, and urban rivers. To expand both awareness and conservation of rivers across the country, American Rivers annually disseminates the "10 Most Endangered Rivers" list, which focuses attention on the problems confronting these threatened rivers.

American Rivers has been involved in issued related to FERC hydropower dams for over ten years, intervening in hundreds of licensings and relicensings nationwide. American Rivers is a founding member and Chair of the Hydropower Reform Coalition.

For more information on American Rivers' hydropower programs, please contact:

Margaret Bowman
Director, Hydropower Programs
American Rivers
1025 Vermont Avenue, NW
Washington, DC 20005

Tel: (202) 547-6900 ext. 3016
Fax: (202) 347-9240
[E-Mail: amrivers@igc.apc.org](mailto:amrivers@igc.apc.org)



Rivers, Trails, and Conservation Assistance Program, National Park Service

The Rivers, Trails, and Conservation Assistance Program (RTCA) of the National Park Service works with communities nationwide to help protect rivers, trails, and greenways on lands outside the federal domain and without federal ownership. RTCA's mission is to advocate the protection, enhancement, and restoration of natural, cultural, and recreational values of rivers, trails, and open spaces; and to support involvement of citizen groups and all levels of government by encouraging and facilitating community-based conservation action.

The National Park Service is one of the many federal resource agencies with which the hydropower applicant must consult in preparing a license application. The National Park Service provides initial review of hydropower proposals for potential interaction with program areas under its purview such as Land and Water Conservation Fund, National Landmarks, Long Distance Trails, National Park Service units, National Wild and Scenic Rivers, and rivers on the Nationwide River Inventory.

In selected hydropower projects, RTCA program staff provide technical assistance to citizen's groups, hydropower applicants, and various levels of government so that the full potential of hydropower relicensing may be realized with respect to: (1) meeting present and future public outdoor recreation demands, *e.g.*, access, facilities, recreational instream flows; and (2) maintaining and enhancing the quality of the project's environmental setting, particularly riparian areas.

The hydropower relicensing opportunities directly relate to RTCA's expanded priorities of contributing to river ecosystem and watershed protection and protecting large landscapes. Since mid-1990, RTCA staff have provided technical assistance in over 100 projects, ensured involvement of recreation groups, and have been active participants in developing settlement agreements.

For more information regarding RTCA hydropower technical assistance, please contact:

Rivers, Trails, and
Conservation Assistance
National Park Service
P.O. Box 37127
Washington, DC 20013-7127

Tel: (202) 343-3780
Fax: (202) 343-3682