TAB 1

1982 Fish and Wildlife Program Measure

1201. The Problem

Fish and wildlife resources of the Columbia River Basin have been adversely affected by past hydroelectric development and could be harmed even more by future development. The Corps of Engineers and the Bureau of Reclamation continue to study the need for additional federal hydroelectric projects and to plan for new development. The records of the Federal Energy Regulatory Commission (the FERC), which licenses non-federal hydroelectric development, suggest that most new hydroelectric development will be accomplished by private or non-federal public entities. The FERC has at least 400 applications pending for hydroelectric development in Idaho, Oregon, Montana, and Washington, and approximately 400 outstanding preliminary permits (indicating ongoing project feasibility studies) in those four states. Many of those applications and permits are for projects throughout the Columbia River Basin. Twenty to fifty small to medium hydroelectric projects are proposed for tributary drainage basins which contain important anadromous fish habitat.

Applications pending

Many of the recent proposals are for small hydroelectric projects of less than 5 megawatts. Although individual projects may have no significant adverse effects on the fish and wildlife resources of the basin, the cumulative effects of such development throughout a river basin could be quite harmful to migratory fish. At present, federal review procedures generally are limited to assessments of individual projects. Little or no consideration is given to the cumulative effects of such dams.

Cumulative effects

1202. Summary of Recommendations

Approximately 40 recommendations for anadromous fish, resident fish, and wildlife program measures call for Council influence over federal development and licensing of new hydroelectric development in the Columbia River Basin. In addition, the Columbia River Inter-Tribal Fish Commission submitted lengthy comments proposing a process to review proposed hydroelectric project development to help ensure that treaty rights are not violated.

Treaty rights

The recommendations proposed procedural and substantive standards designed to ensure that no new hydroelectric development takes place without consideration of cumulative effects and adequate mitigation of any adverse effects on fish and wildlife. A significant number of recommendations request that certain unaltered streams and priority wildlife habitat areas be protected from all hydroelectric development as compensation for the extensive fish and wildlife losses caused by hydroelectric development in the past. These proposals raise the question of whether the region can forego such development in the interest of fish and wildlife protection and still maintain an adequate, efficient, economical, and reliable power supply.

Protected areas

1203. Council Response

The Council agrees that future hydroelectric developers in the basin should be required to mitigate harm to fish and wildlife, and adopted program measures calling for such mitigation.

The Council also agrees that federal agencies should assess and mitigate cumulative effects of multiple hydroelectric projects on fish and wildlife. It appears that additional study is needed to design methods for assessing cumulative effects and incorporating such assessments into federal review processes.

Develop assessment methods

The Council further agrees with the concept of protecting some streams and wildlife habitats from all hydroelectric development. However, the Council will not adopt a permanent moratorium on hydroelectric development in any area until the Council, with review and participation by the fish

Fish and wildlife habitat

and wildlife agencies and tribes, has completed a study of alternative means for developing and protecting a system of critical fish and wildlife habitat areas throughout the Columbia River Basin. Recommendations for protective classification did not have the benefit of a standard set of systemwide criteria. This study would establish such criteria, taking into account the power supply trade-offs involved.

Council review

The Council also proposes regular Council review of applications for FERC permits and licenses and of Corps of Engineers and Bureau of Reclamation proposals for hydroelectric development. Such reviews would be designed to ensure that new development in the Columbia River Basin is consistent with the fish and wildlife program and the Council's regional energy plan. Reviews by the Council would complement and recognize, not supplant, the role of the fish and wildlife agencies and tribes in review of proposals for hydroelectric projects.

There are several new turbine intake screen designs that have been developed in recent years, but these screens have not been tested sufficiently to be characterized as proven, even though they have the potential for reducing costs as well as improving juvenile mortality. Responding to concerns about the available technology on turbine intake screen design, in 1984 the Council added a new measure to this section which provides for Bonneville funding of design studies for turbine intake screens. Installation and maintenance of currently available screening systems are expensive, and significant juvenile mortality can result from their use.

1204. Measures

(a) Conditions of Development

Fish resources

(1) The FERC, the Corps of Engineers, the Bureau of Reclamation, and Bonneville shall not license, exempt from license, relicense, propose, recommend, agree to acquire power from, grant billing credits for, or otherwise support any hydroelectric development in the Columbia River Basin without providing for:

(A) Consultation with the fish and wildlife agencies and tribes and the Council throughout study, design, construction, and operation of the project;

(B) Specific plans for flows and fish facilities prior to construction;

(C) The best available means for aiding downstream and upstream migration of salmon and steelhead;

(D) Flows and reservoir levels of sufficient quantity and quality to protect spawning, incubation, rearing, and migration;

(E) Full compensation for unavoidable fish or fish habitat losses through habitat restoration or replacement, appropriate propagation, or similar measures consistent with the provisions of Section 704;

(F) Assurance that the project will not inundate the usual and accustomed fishing and hunting places of any tribe;

(G) Assurance that the project will not degrade fish habitat or reduce numbers of fish in such a way that the exercise of treaty rights will be diminished; and

(H) Assurance that all fish protection measures are fully operational at the time the project commences operation.

TAB 2

1983 Power Plan Provisions on Site Ranking

"The plan shall [include] *... due consideration for environmental quality [and the] protection, mitigation, and enhancement of fish and wildlife"*

Chapter 9
Consideration of Environmental Quality and Fish and Wildlife

In compliance with the Northwest Power Act, the Council has considered environmental quality and fish and wildlife concerns throughout development of this energy plan. Although these considerations were important, the Act also required the Council to consider the compatibility of the plan with the existing regional power system, to choose the most cost-effective resources, and to follow certain priorities in selecting those resources. For this reason, selection of the resource portfolio involved not only choosing those resources which were most environmentally sound or most protective of fish and wildlife, but also balancing these concerns with the other requirements.

In addition, the Act requires that all resource cost-effectiveness evaluations must include quantifiable environmental costs and benefits. Costs for pollution abatement equipment and fish and wildlife mitigation required under state and federal regulations have been included in estimates of generic resource costs. The Act further specifies that the Council must develop a method to quantify other environmental costs and benefits to be used by Bonneville in measuring the cost-effectiveness of specific resource acquisition decisions. This method, developed by the Council, is presented in Appendix C. The Council expects Bonneville to use this method in evaluating each resource and resource site prior to acquisition.

This chapter describes the process the Council used in giving due consideration to environmental quality and fish and wildlife in its selection of resources.

Environmental Quality

Due Consideration Process

The Council began its consideration process by performing studies to identify the potential environmental and fish and wildlife effects on resources. These studies and important issues arising from them were subjected to public review and comment and guided the Council as it drafted its resource portfolio.

During the public comment period on the draft plan, many comments and considerable data were received regarding the environmental effects of the various resources discussed in the plan. In particular, many public commenters offered data documenting the environmental effects of hydropower dams, coal-fired power plants, and high-voltage transmission lines. All this information was carefully considered by the Council.

During review of the draft plan, the Council held a public consultation meeting on March 21, 1983 to discuss the Council's consideration of environmental quality and fish and wildlife concerns. This consultation was attended by representatives of environmental groups, Indian tribes, utilities, and an agricultural organization. Views and data presented at this meeting assisted the Council in furthering its consideration of environmental quality and fish and wildlife concerns.

Analysis of Resources and Alternatives

While selecting the individual components of its resource portfolio, the Council assessed all available energy technologies, including their environmental benefits as well as impacts. The Council also considered the amounts of power to be expected from each resource type, how effects on environmental quality and fish and wildlife could be mitigated, and how mitigation measures may affect energy production. Although not included as major components of the Council's plan at this time, the environmental costs and benefits of alternative resources such as geothermal, solar-electric generation, and wind were considered. These alternative resources will be closely monitored and assessed in the future for their environmental effects as well as for their increased cost-effectiveness and feasibility. As they become eligible for inclusion in the Council's resource portfolio, these resources again will be subject to the same environmental considerations.

This section discusses some of the mitigation measures that the Council expects Bonneville to consider in any resource acquisitions or other actions which are required by the Act to be consistent with the plan. While the Council has now adopted specific standards only for hydropower development (for the protection of fish and wildlife, in Appendix E), it is expected that the implementing agencies will be guided by the considerations set forth in this appendix. Over the next two years, the Council will study the feasibility of establishing a general set of resource acquisition criteria. The analysis that follows first discusses the resources that are included in the two-year action plan and then the resources identified for acquisition in later years and then only if higher growth is realized.

Conservation

The Council expects that conservation will contribute by far the largest share of energy under any of the resource mixes for the four growth forecasts. To that end, the two-year action plan includes measures in the residential sector to weatherize existing houses and to set weatherization standards for both new houses and houses converting to electric space heating. In the commercial sector, the Council expects two-year actions to include weatherizing new buildings and setting conversion standards. The action plan also calls for acquiring industrial and agricultural conservation savings. These conservation actions were developed by the Council with full consideration of their potential environmental costs and benefits.

As identified by the Council, the environmental benefits of conservation are substantial. First, reduction of electric demand due to conservation measures can help the region avoid construction of new conventional energy resources with their accompanying environmental impacts. Conservation "generates" electricity without transmission lines, significant air or water pollution, noise, solid waste, or land use impacts. Though the production of conservation devices (insulation, storm windows, etc.,) may include some environmental impacts, the Council recognizes that the

amount of electricity "produced" by conservation is much more environmentally acceptable than, for example, the equivalent amount of energy generated by a coal-fired power plant or hydropower dam. The 5,100 megawatts expected to be contributed by conservation under the Council's high growth forecast is equivalent to the output of fourteen 366-megawatt coal-fired power plants (the size of plants assumed by the Council if increments of coal-fired generation are required), and is accompanied by only minor environmental impacts.

Conservation is not likely to harm fish and wildlife. In fact, by reducing the use of fossil fuels, conservation will benefit fish and wildlife by avoiding unnecessary air and water pollution, transmission lines, mining, habitat interference or destruction, and water use. However, the Council is concerned about the potential indoor air quality impacts of weatherization unless mitigation measures are employed. The Council study noted that residential weatherization could reduce ventilation and cause harmful concentrations of various pollutants from space heating equipment, insulation, and building materials. These pollutants included formaldehyde from particle board and some insulation, and radioactive emissions from masonry and concrete buildings. The report noted, however, that health levels for these pollutants have not yet been established.

The Council decided that heat exchangers could adequately mitigate these air quality impacts in that they provide adequate ventilation without sacrificing much heat. The Council's model conservation standards include an air-to-air heat exchanger if the house does not meet Bonneville's exemption criteria for air-tightening measures. With this mitigation, the Council believes that conservation is attractive from an environmental perspective.

Hydropower Development

The Council's two-year action plan also calls on Bonneville to acquire options on hydropower projects at six sites. The development process for the Council's Columbia River Basin Fish and Wildlife Program, adopted November 15, 1982, provided a wealth of information on the fish and wildlife and environmental effects of hydropower development as well as measures for mitigating those effects. Those considerations have also been taken into account in this plan to the extent they are appropriate outside the Columbia Basin. The Council's fish and wildlife program should be examined for a more complete description of the impacts and mitigation measures applicable to the Columbia River Basin.

The Council identified several potential environmental effects of hydropower development. For one, the transformation of a river to a deep, still reservoir can alter the temperature of the water. However, the use of special structures and reservoir draft techniques can mitigate this effect. Another impact is nitrogen supersaturation caused by spilling water over the dam. Though lethal to fish, it can be avoided with the use of devices that deflect spilled water. These impacts are generally limited to large hydropower projects involving reservoirs, while the Council expects many new hydropower projects to be small, run-of-the-river projects without reservoirs.

Construction of a hydropower project may include erosion and sedimentation near the stream, causing increased water turbidity. The Council's data note that these effects can reduce the aesthetic quality of the stream as well as harm its value for fish, wildlife, or recreational uses. Sometimes, these effects are limited to the period of construction and are not considered significant enough to warrant foregoing otherwise feasible hydropower sites.

Federal law prohibits licensing hydropower projects on or directly affecting wild and scenic rivers, and special consideration is required when historic or archeologic sites, national wildlife refuges, national monuments, national recreation areas, endangered species habitat, or lands adjacent to wilderness are involved. In estimating the amount of hydropower potential, the Council accordingly eliminated such areas from consideration.

Installation of hydropower projects on a previously free-flowing stream can reduce or eliminate the stream's value for kayaking, rafting, and some types of fishing, as well as reduce the forest land base and eliminate Indian religious sites through inundation. Also, although the effects of particular projects may be relatively minor, the cumulative effects of several hydropower dams on a single stream can be serious. However, this plan includes measures described below to support future hydropower development at the least sensitive locations and with minimum environmental impact. The fish and wildlife program portion of this energy plan is applicable only to the Columbia River Basin, while the energy plan itself is applicable to the entire region. Measures adopted by the Council for the Columbia Basin and the rest of the region are more fully described in the discussion of fish and wildlife impacts in a later section of this chapter.

Because of these safeguards, the Council believes needed additional hydropower development can occur in an environmentally sound manner. The first hydropower included in the plan would not be needed until the early 1990's. This allows sufficient time to study the impacts of hydropower and to refine methods for alleviating them. The effects of hydropower generation are limited generally to the stream affected by the dam. No serious air pollution or solid waste problems are raised by hydropower projects, and they do not rely on a finite fossil fuel. It should be recognized, however, that the Council's environmental assessment of hydropower so far has addressed only generic hydropower projects. The site-ranking study (see chapter 10) will focus on the potential environmental impacts of siting projects on particular stream reaches.

Solar electric generation is another resource not yet included in the Council's portfolio because of present high costs and immature technology. The Council's data indicates that this technology also would have relatively minor environmental impacts. Solar systems using fluids to exchange heat raise a possibility of contamination of water and land, albeit minor. A typical solar-electric generation plant will require installation of solar reflectors or cells on large land areas and could affect land use, wildlife habitat, and aesthetics. However, because such plants would not include major water or air pollution or solid waste disposal problems, the Council expects that the impacts of solar-electric generation would be minor compared to the wide range of serious effects associated with large-scale thermal electric generation. As this and other emerging technologies mature, the Council will gather additional, more detailed data concerning their environmental effects, which will receive careful consideration in all future Council decisions regarding these resources.

Additional Fish and Wildlife Concerns

Due Consideration Process

The requirement of due consideration for fish and wildlife is in addition to the Act's mandate that the Council adopt a Columbia River Basin Fish and Wildlife Program. That program was adopted by the Council on November 15, 1982, and is contained in Volume III of the energy plan.

The fish and wildlife program is, however, limited to the Columbia River Basin. The energy plan, on the other hand, must cover the entire region. Also, the plan covers all types of generating resources, while the fish and wildlife program was limited to dealing with the effects of the hydropower system. Under the Council's energy plan, resource acquisitions by Bonneville generally must comply with the plan's environmental and fish and wildlife provisions. Those acquisitions proposed within the Columbia River Basin must also comply with the provisions of the Council's fish and wildlife program.

The Council's consideration of the relationship between energy supply and development and the protection of fish and wildlife began with its development of the Columbia River Basin Fish and Wildlife Program. Federal hydropower project operators and regulators must take that program into account at each relevant stage of decisionmaking to the fullest extent practicable. Also, Bonneville must use its legal and financial powers consistently with the program. On December 16, 1982, the Council also released an "Environmental Document for the Columbia River Basin Fish and Wildlife Program." That document described consideration of the fish and wildlife and environmental impacts of the Council's Columbia River Basin Fish and Wildlife Program. It noted that, while some minor environmental impacts might result from implementation of the Council's program, its overall effect was to remedy effects that had gone largely unmitigated for decades. The document noted numerous ways in which the Council's program would benefit fish and wildlife in the Columbia River Basin.

The effects of the Council's fish and wildlife program were considered as the Council developed its energy plan. For instance, annually 450 average megawatts of energy capability are estimated to be lost due to use of the Council's Water Budget to provide adequate flows for migrating anadromous fish. This was taken into account in the Council's estimate of the amount of hydropower available to meet future demand.

The costs of fish and wildlife mitigation and protection measures required in the fish and wildlife program were included as the Council estimated costs of various resources. As previously noted, also included in the Council's resource cost calculations were the costs of pollution control technology required by existing law. By reducing or preventing air and water pollution, these measures will benefit fish and wildlife.

Analysis of the Fish and Wildlife Impacts of Hydropower Development

Hydropower development can have serious effects on fish and wildlife. Construction of dams may create reservoirs that inundate important wildlife habitat. However, as previously noted, the Council expects many of the new hydropower projects to be run-of-the-river projects without reservoirs. As noted in the fish and wildlife program, dams hinder migration of fish. Juvenile anadromous fish passing downstream may be slowed by the size of the reservoirs or killed while passing through the dam's turbines. Successive dams and reservoirs on a single river can eliminate the natural flushing of migrating juvenile fish to the ocean during the spring months. Without adequate passage facilities, dams present barriers to upstream migration as well. Water level fluctuations above or below hydropower dams can disrupt fish spawning and strand wildlife populations. Water impoundments caused by hydropower dams can alter water temperatures to the detriment of fish. Many comments from fish and wildlife agencies, Indian tribes, and environmental groups have expressed concern over the role hydropower is expected to play in the Council's resource portfolio. Some suggested that the cumulative effects of many small hydropower projects on certain stream-reaches could be catastrophic to both anadromous and resident fish.

Within the Columbia Basin, the Council's fish and wildlife program includes a Water Budget on the Columbia and Snake rivers designed to provide adequate flows for downstream migration. The Council's program also includes specific measures across the Columbia Basin to assist fish in upstream migration. These measures incorporate provisions for flows and spill as well as fishways. The Council's program includes measures applicable to the Columbia Basin to minimize the harmful effects of water level fluctuations, and temperature control measures for specific Columbia Basin dams.

Thus, all future hydropower projects within the Columbia Basin will be subject to specific provisions in the Council's program to avoid or mitigate the above effects. The program calls for consolidated review of all applications or proposals for hydropower development in a single river drainage within the Basin. The Council intends such review will assess cumulative effects of existing and proposed hydropower development on fish and wildlife. The program also expects Bonneville to fund a study to develop criteria and methods for assessing potential cumulative effects of hydropower development. The program calls on Bonneville to study alternative methods for classifying and designating certain streams and wildlife habitat in the Basin for protection from future hydropower development, based upon their value for fish and wildlife and their hydropower potential. Based upon this study, the Council will designate streamreaches and wildlife habitat within the Columbia Basin to be protected from further hydropower development. Finally, the program calls on the Federal Energy Regulatory Commission to require all license applicants within the Basin to demonstrate how their proposed projects would take the Council's program into account to the fullest extent practicable.

The conditions for Bonneville's support of hydropower within the entire region (included in Appendix E) are designed to avoid or mitigate these kinds of effects described above when they occur outside the Columbia Basin. The plan also calls for a study to identify and rank potential hydropower development sites within the entire region. This ranking system will be based upon many factors, including the projects' risk to fish and wildlife populations and habitat.

Although hydropower development includes serious risks to fish and wildlife, the Council believes that the provisions of this plan will minimize the effects of any future hydropower development. Subject to these comprehensive measures, hydropower development should cause relatively minor environmental and fish and wildlife effects compared to large-scale thermal generation. Dependent upon a renewable fuel, hydropower avoids the air pollution, solid waste, and mining effects of thermal power. In fact, comments from the Corps of Engineers and some utilities suggest that some hydropower projects may benefit fish by providing controlled flows and water temperatures.

Bonneville Actions

Bonneville shall:

13.1 Enter into a comprehensive process of cooperation with the four Northwest states in order to exchange information on energy resource and energy facility siting. The purpose of this arrangement will be to coordinate information about projected regional energy needs and the types of resources that will satisfy those needs. This exchange will lead to consistent federal and state policies regarding projected resource acquisitions with due deference to state siting constraints and considerations.

13.2 Create a state options task force with representatives of the four states (and in particular, any state siting authority), Bonneville customers, public interest groups, and the Council. The purpose of this task force will be to develop provisions for options in each state. For example, the State of Oregon Siting Council has proposed a method of banking sites for regional resources within the State of Oregon. Although a great many questions remain to be resolved, this proposal provides a significant step toward the successful coordination of an options process in the region such that the authority of the state Siting Council is fully recognized while providing the region with a reliable plan for meeting its needs for resources through the options concept.

13.3 Identify, by project, specific resources which may be lost to the region if decisions to acquire an option or to acquire the resources are not made. This inventory should recognize each resource sponsor's requirements for keeping the resource available to the region.

13.4 Explore opportunities for marketing power and for removal of constraints to marketing power outside the region which could facilitate development of some resources.

Council Actions

The Council will:

13.5 Establish a task force composed of representatives of the Council, Bonneville, utilities, and other interested parties to identify for each resource type: (1) each significant potential federal and state regulatory impediment to success of the options program; and (2) proposed means of resolving that uncertainty through informal understandings with the affected agencies, amendments to statutes or regulations, or other means.

13.6 Adopt criteria for determining when resources under options are sufficiently firm to be counted as "available" within the meaning of the Act.

13.7 Determine, with the assistance of other analyses to be conducted as part of this two-year plan: (1) the optimum size of the options inventory to permit development of an adequate supply of available resources; and (2) the appropriate timing for concluding option agreements to permit adequate flexibility in the preconstruction process.

13.8 Develop alternative planning approaches if options prove to be unworkable. These approaches would have to reexamine the appropriateness of planning to a high demand forecast. Other methods of obtaining resource flexibility and shorter lead times will also be explored.

14. Hydropower

The objective of this program is to test the options concept by pursuing options for future hydropower development. The Council has concluded that hydropower is an important resource in this plan. In the high growth forecast up to 920 megawatts of hydropower would be needed and appear to be available at less than 4.0 cents per kilowatt-hour. The Council recognizes that modifications to regulatory processes may have to be made before hydropower can be treated as an option in the Council's planning strategy. Further, there is unresolved concern regarding the effects of hydropower development on fish and wildlife in the region. The Council's two-year actions address these concerns.

During this two-year action plan, Bonneville shall acquire an option on each of the following listed facilities only after a finding has been made that the construction and operation of each facility will have an insignificant adverse effect on fish and wildlife population and on habitat.

Such a finding may be made only after consultation among representatives of Bonneville, the U.S. Army Corps of Engineers, the Bureau of Reclamation, the Council, state and federal fish and wildlife agencies, Indian tribes, the region's utilities, and interested non-utility sponsors.

Bonneville Action

Bonneville shall:

14.1 Acquire options on the following six categories of hydropower facilities:

1. An existing dam, currently not generating electricity, with a capacity greater than 15 megawatts.
2. An existing dam, currently not generating electricity, with a capacity of between 5 and 15 megawatts.
3. A new facility with a capacity greater than 25 megawatts.
4. A new facility with a capacity between 10 and 15 megawatts.
5. A new facility with a capacity less than 10 megawatts.
6. A new facility with an exemption from the FERC licensing process.

In acquiring options on hydropower sites, Bonneville shall adhere to the provisions of Appendix E.

Council Actions

The Council will:

14.2 Design a study to identify and rank potential hydropower sites in the region. This study will include representatives from Bonneville, the U.S. Army Corps of Engineers, the Bureau of Reclamation, the

Council, state and federal fish and wildlife agencies, affected Indian tribes, the region's utilities, and interested non-utility resource sponsors. The organization of the study, specific tasks necessary to meet the study objectives and the funding sources will be determined after the adoption of the plan and in consultation with all of the parties identified above.

Potential hydropower sites will be ranked based on fish and wildlife concerns.

Category I. Sites at which the construction and operation of hydropower facilities will have insignificant adverse effects on fish and wildlife population and habitat.

Category II. Sites at which the construction and operation of hydropower facilities will have significant adverse effects on fish and wildlife populations and habitat, but may be reduced to an insignificant level by development and implementation of proven mitigation techniques.

Category III. Sites at which the construction and operation of hydropower facilities will have significant adverse effects on fish and wildlife populations and habitat which cannot be reduced satisfactorily because of the critical nature of the habitat or populations affected, the lack of proven mitigation techniques, expense and delay, or any other reason.

The study should be based on existing data, studies, and literature to the extent these are sufficient. The emphasis of the study should be to first identify sites within Categories I or II in order to facilitate early commitment to those sites.

The term 'sites' has been used in a broad sense to cover both specific sites and stream reaches. Although the comprehensive study might take two years or more, a progress report will be made to the Council on specific sites currently in the FERC licensing process by January 1985. This information will be used in the next revision of this plan, scheduled for adoption in November, 1985. This study shall be coordinated with other studies being done under the Council's fish and wildlife program and with the Council's efforts to refine current hydropower data bases.

14.3 Continue in its efforts to refine the data base on existing and potential hydropower sites that are environmentally sound and cost-effective. The Council will coordinate this effort closely with the hydropower ranking study discussed above.

15. Market Interruptible Energy in the Northwest

The objective of this program is to develop additional markets for interruptible energy in the Northwest. The effort to develop additional means of retaining the economic benefits of low-cost non-firm energy in the region is the most important energy-related economic issue over which the region has control, and it should be treated accordingly.

Bonneville Actions

Bonneville shall:

15.1 Initiate a policy to develop, to the fullest extent possible, regional markets for non-firm energy including industrial, commercial, and irrigation markets.

15.2 Set an initial goal of 900 to 1,400 megawatts of potential interruptible load in the industrial sector and conduct further investigations to determine whether more potential is available.

Council Action

The Council will:

15.3 Study whether the region should develop Northwest markets for conversion of existing firm loads to interruptible status. Such loads might include the second quartile of DSI power, some industrial loads of utilities, and certain irrigation loads. Bonneville could purchase the right to interrupt the load during a particular low-water event. In the case of irrigation loads, farmers could decide to use cheaper interruptible power to serve a portion of their existing firm loads. The interruptibility would be gained solely through voluntary contractual arrangements between Bonneville and the customer or utility and would not be a condition of service for any customer. This study will be done in consultation with Bonneville.

16. Sale of Firm Surplus Energy to the Southwest

Bonneville and other regional utilities are engaged in an effort to market the current firm surplus to the Southwest. The Council supports these efforts. The proposed sale of the region's firm surplus is entirely consistent with efforts to market interruptible energy within the region. Neither effort is a substitute for the other.

Council Action

The Council will:

16.1 Open discussions with the California Energy Commission regarding a sale of firm surplus power. The Council intends to consult with Northwest utilities and Bonneville as part of this process. The Council recognizes the potential benefits to both Northwest and Southwest and is prepared to use its regional power planning authority to encourage a sales agreement that benefits both regions.

17. Geothermal

The Council has concluded that a large geothermal potential exists in the region for both electric generation and direct applications that decrease the need for electricity. (Direct applications of geothermal and other renewable resources are considered in chapter 7, Conservation.) However, the precise size, characteristics, and technical potential of the geothermal resouces has not been determined. The objective of this program is to encourage confirmation of the region's geothermal resource for electric generation so it can be developed quickly when the need exists. The following actions are expected to provide a base for including geothermal resources in future plans.

Bonneville Action

Bonneville shall:

17.1 Develop and implement a geothermal demonstration program that guarantees the purchase of electricity from the first 10 average megawatts generated at the most promising environmentally acceptable geothermal site available in the region. The

TAB 3

1983 Roster of Hydropower Assessment Steering Committee

DANIEL J. EVANS
Chairman
Washington

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[illegible]ashington

Keith Colbo
Montana

Gerald Mueller
Montana

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Robert (Bob) Saxvik
Vice-Chairman
Idaho

W. Larry Mills
Idaho

Alfred A. Hampson
Oregon

Roy Hemmingway
Oregon

August 2, 1983

HYDROPOWER ASSESSMENT STEERING COMMITTEE

	AGENCY OR ORGANIZATION	PERSON TO BE CONTACTED TO REQUEST DESIGNEE
(1)	Bonneville Power Administration	Peter Johnson and Mike Katz
(2)	National Marine Fisheries Service	Burt Larkins
(3)	Federal Energy Regulatory Commission.	Quentin Edson
(4)	U. S. Bureau of Reclamation	William Lloyd
(5)	U. S. Army Corps of Engineers	General James van Loben Sels
(6)	Columbia River Inter-Tribal Fish Commission	S. Timothy Wapato
(7)	Northwest Indian Fisheries Commission	Billy Frank
(8)	National Wildlife Federation	Terence Thatcher
(9)	Pacific Northwest Utilities Coordinating Committee	Randy Hardy
(10)	Small Hydro Developers Association	Neil McDonald
(11)	U. S. Fish and Wildlife Service	Richard Myshak
(12)	State of Idaho	Governor's Office
(13)	State of Montana	Governor's Office
(14)	State of Oregon	Governor's Office
(15)	State of Washington	Governor's Office

TAB 4

1984 Decision Memorandum, Issue Paper and Work Plan for Hydroelectric Assessment Study

KEITH L. COLBO
Chairman
Montana

Gerald Mueller
Montana

rles Collins
ashington

Kai N. Lee
Washington

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DECISION MEMORANDUM

August 22, 1984

TO: Council Members

FROM: Peter Paquet, Manager
Project Operations and Development

RE: Pacific Northwest Hydro Assessment Study

PROPOSED ACTION

1. Approve BPA funding of non-anadromous fish portions of the Pacific Northwest Hydro Assessment study, as described in Part IV of Attachment 1.

2. Authorize the Council staff to pursue contracting related to the anadromous fish portion of the Pacific Northwest Hydro Assessment study, as described in Part III of Attachment 1.

SIGNIFICANCE

Both the Council and Bonneville have budgeted FY 1984 and FY 1985 funds for hydropower assessment activities. The hydro assessment study proposed by the staff would help provide the necessary information to designate protected areas, as called for in Section 1204 of the Fish and Wildlife Program, to identify and rank potential hydropower sites throughout the region based on fish and wildlife concerns and to improve the Council's hydroelectric supply curve, as called for in Action Item 14.2 and 14.3 of the Power Plan. Approval of the work plan at this time is necessary if fiscal 1984 funds are to be committed before October 1, 1984.

BUDGETARY/ECONOMIC IMPACT

The estimated cost of this study is $1.5 million. Cost estimates are included in Attachment 1.

The Council staff will solicit proposals to contract for an anadromous fish coordinator before the end of FY 1984. If no adequate proposals are received, then contracting will have to be postponed until FY 1985. That would mean that FY 1984 funds budgeted for this purpose would be returned

to Bonneville and FY 1985 contracting would be accomplished through a supplemental budget or other cooperative arrangements with Bonneville.

Based on discussions with HASC, it has been estimated that approximately $500,000 will be needed for the anadromous fish portion of the study which is to be funded by the Council. There is approximately $300,000 in the Council's FY 1984 and FY 1985 budgets for hydro assessment work. Savings in other areas could provide additional funds up to $500,000, if needed.

BACKGROUND

Section 1204(c)(1) of the Council's Fish and Wildlife Program calls on Bonneville, upon approval by the Council, to conduct an 18-month study of alternatives for classifying and designating certain stream and wildlife habitat in the Columbia River Basin to be protected from future hydroelectric development. Based on the results of that study, the Council, pursuant to Section 1204(c)(2) of the program, will designate such protected areas for their fish and wildlife value and hydropower potential.

Action Item 14.2 of the Council's Northwest Conservation and Electric Power Plan's two-year action plan states that the Council will design a study to identify and rank potential hydropower sites throughout the region based on fish and wildlife concerns. The ranking will result in three categories of sites: 1) those that will have insignificant adverse impacts on fish and wildlife; 2) those where adverse impacts can be mitigated; and, 3) those where adverse impacts cannot be mitigated. Two-year action item 14.3 calls on the Council to continue its effort to refine the data base on existing and potential hydropower sites that are environmentally sound and cost-effective.

Because all of these measures are closely related, the Council established the Hydropower Assessment Steering Committee (HASC) to advise it on coordination of these actions per action item 14.2 and 14.3.

The purpose of the Hydro Assessment Study is to help collect the information necessary to accomplish the three objectives set forth in the Fish and Wildlife Program and the Power Plan. First, the study will provide information to help the Council designate areas to be protected from hydroelectric development in the Columbia River Basin. Second, it will provide the Council with information to be used in the hydropower site ranking. Third, it will provide the information on environmentally-sound hydroelectric sites which the Council needs to improve the "hydropower supply curve."

For anadromous fish, the hydro assessment study will be conducted at the regional level and will characterize stream reaches on the basis of their productivity (emphasizing potential productivity over actual productivity), their importance as migratory routes, their habitat value, and their significance to tribal entities. The data for this characterization would be provided by the fish and wildlife agencies, tribes, and utilities.

For resident fish and wildlife and for non-fish and wildlife values the study will be conducted at the state level. The states, federal agencies, and tribes will work through this process to identify the significance of each stream for several river values as is appropriate to the responsibility of each.

River values to be considered would be institutional (e.g., wild and scenic rivers), resident fish, wildlife, recreational, cultural (e.g., historic and archaeological), and natural features. The net result will be one or more statements about the significance of each river value for each stream.

Indian cultural values would be identified through a separate process because of their unique and sensitive nature. The Council will contract with an appropriate entity or individual to request the tribes to present an independent assessment of how Indian cultural values potentially will affect hydroelectric development.

Overall project management will be the responsibility of Council staff and Bonneville. The Council will be responsible for the anadromous fish portion of the study. The Council study will be done under contract. A contractor will coordinate agreements between the various agencies and tribes on technical matters and facilitate collection of needed data by subcontracting with the states, federal agencies and tribes. The contractor also will be responsible for data compilation and production of final reports.

Bonneville will fund the resident fish, wildlife, and other environmental values portion of the study through contracts with the states and federal agencies. Bonneville will hire a coordinator to manage this effort. Study coordinators in each state will have responsibility for the state effort. State coordinators will be responsible for ensuring that data are collected and reported in a manner compatible with the overall study approach.

When the data collection and compilation are completed the anadromous fish, resident fish and wildlife information will be combined with the hydro site data base being developed by the Council and the Corps of Engineers to allow the Council staff to make recommendations on protected areas and site ranking.

The hydroelectric assessment work plan also will include development of an estimate of developable hydropower for supply curve use. This will be accomplished by identifying the electrical capability and cost of all projected hydropower projects in the region (Council/Corps data base) and then reducing this estimate by an amount consistent with the Council's designation of protected areas and site ranking. This estimate will be reduced further based on the significance of other river values identified in the study.

The river assessment study will begin on October 1, 1984, and recommendations for protected areas and site ranking will be made to the Council in 1986. A more detailed schedule is provided in Attachment 1.

ANALYSIS

If the Council approves the hydroelectric assessment work plan, by implication it will be approving the protected area study (1204(c)(1)), and the site ranking study (action item 14.2), and the hydro supply curve study (action item 14.3). This, in fact, is one of the major advantages of the proposed study -- it combines into a single integrated study three closely-related Council efforts. By combining these efforts there is less chance of duplication and a greater chance that the different components of the study will be

compatible. It also ensures that there will be consistency in the data base being used both for power planning and fish and wildlife assessments.

There are several other alternatives to the river assessment study which the Council may wish to consider. These alternatives are discussed below.

1. Rank sites and designate protected areas without further studies. The Council could simply solicit recommendations for protected areas and site ranking. This alternative is analogous to the process used by the agencies and tribes in making their original recommendations to the Council for protected areas in the Columbia River Basin. It has the advantage of being rapid and inexpensive, but it could result in a nonuniform recommendation not based on common criteria -- the reason for the Council rejecting the original protected areas recommendations. It also would put the Council in the position of evaluating the recommendations without the baseline information needed for evaluation.

Another approach would be to ask the fish and wildlife agencies and tribes to develop and propose criteria for the three categories specified in the Power Plan and for protected areas. These criteria then would be submitted to the Council for approval and adoption, and the fish and wildlife agencies and tribes would be asked to apply them. Again, there is the advantage of a rapid and cost-efficient method, with the added plus of regionally-consistent criteria. However, it would place the Council in the position either of rubber-stamping the applications of the criteria by the agencies and tribes or of evaluating those applications without the baseline information which would be provided through a study.

2. Amend the Fish and Wildlife Program to delete protected area designations. This decision could be based on a conclusion that no areas need be protected or on the other hand that no new hydro should be developed in the Columbia River Basin until all damages attributable to the present hydroelectric system are fully mitigated.

The former conclusion probably is unwarranted, given the devastation of fish runs in the Columbia River Basin. The latter conclusion fails to recognize specific project types, some of which may have no impact or positive impacts on fish and wildlife.

3. Amend the Power Plan to delete site ranking. The Council's forecasts indicate that currently there is a surplus of electricity in the region. Even under the high growth scenario, no new hydropower need is forecasted until 1993. Because of this, the Council could simply make it clear that it will not support any new hydro development until it is needed and could amend the Power Plan to delete site ranking since there is no longer a need to identify developable sites (Categories I and II). Or the Council could rely on cost-effectiveness and fish and wildlife criteria to ensure that only low cost sites that will not endanger fish and wildlife will be developed.

Such a decision would not likely affect the Council's power planning effort, since it could still go forward with efforts to update supply curve

estimates and identify environmentally acceptable hydropower projects without going through the time-consuming and controversial process of formally ranking them.

The staff does not recommend this alternative, since it still would be necessary to designate protected areas, carry out the Hydro Assessment Study to get the information necessary to update the hydro data base and to develop supply curves. This issue can be addressed fully in the upcoming Power Plan amendment process.

4. Postpone approval of part or all of the study until a goals study decision has been made. Delaying all or part of the hydro assessment study has both pros and cons. The Council has called for a "goals" study (program Section 201) and a cumulative impact study (Section 1204(b)(2)). Neither of these studies has been initiated, so it is not possible to ensure that the hydroelectric assessment study will be consistent with them. In the case of the cumulative impact study, this does not appear to be a problem, since that study is currently being designed to evaluate specific project proposals and would complement the hydro assessment study.

The Council has not made a decision on the goals study. Collection of productivity information could be an ingredient of such a study. Because of this, the Council may wish to delay the anadromous fish portion of the hydro assessment study to ensure compatibility with the goals study. However, delaying all of the hydro assessment study until a decision is made on the goals study also seems counterproductive, since only the Columbia River Basin anadromous fish portion of the study potentially would overlap with a portion of the goals study. Moreover, the hydro assessment study has been designed so that it stands independently, whether or not the goals study proceeds, and can be adjusted to be compatible with a range of possible approaches to the goals study, if the Council so directs. For this reason the staff has not recommended that the Council delay going forward with this study. Additional protection against duplication or inconsistency could be provided by scheduling the Columbia River Basin part of the hydro assessment study later in the study year so that it can be coordinated with a goals study.

5. Approve a different study method. An alternative to the state-managed approach (except for anadromous fish and Indian cultural values) would be a regional approach. The tribes and some federal agencies have indicated that they prefer the regional approach for the entire study. However, the staff believes that, except for anadromous fish and Indian cultural values, the other resources that are proposed for study are for the most part under control of the states and therefore, it is appropriate that the states make recommendations to the Council. It should be noted that some resources are not controlled by the states. They may be controlled by tribes, federal, or local agencies. However, it is not the purpose of this study to have states screen the views of these other groups. The states will simply collect and pass on to the Council these other views.

Attachment

Attachment 1

PACIFIC NORTHWEST HYDRO ASSESSMENT STUDY

WORK PLAN

Prepared By

THE NORTHWEST POWER PLANNING COUNCIL
700 S.W. Taylor
Portland, Oregon 97205

August 1984

Note: This proposed work plan describes the general framework of the study. More detailed work statements (identifying all specific work products and deadlines, for example) will be prepared to aid contracting. The work statement will be consistent with the work plan.

PACIFIC NORTHWEST HYDRO ASSESSMENT STUDY

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I. INTRODUCTION

The Pacific Northwest Hydro Assessment Study will develop data from which the Northwest Power Planning Council will address new hydroelectric development in the region. The Council plans to determine how much cost-effective hydro is realistic within the region for the purpose of updating its power plan. It also plans to rank hydroelectric sites throughout the region on the basis of their effects on fish and wildlife values and to designate areas to be protected from future hydro development on the basis of fish and wildlife values and hydropower potential.

In its initial consideration of hydropower availability, the Council was presented with estimates ranging from 400 to 4,000 megawatts. This study will help provide a more factual basis for estimating hydro availability, but it will not answer all questions. This study does not review hydro sites with the same rigor as will be done in the licensing process. It does attempt to anticipate the results of the licensing process through use of relatively simple surrogate techniques. This work is done in a way that future work can build on it, if such need is identified.

The Hydro Assessment Study would provide the Council with information to aid in:

- o determination of the theoretical potential of hydro and its cost by characterization of both proposed and potential sites (work by the Corps of Engineers, Bonneville Power Administration and the Council is currently underway);
- o ranking of hydro sites and designation of areas which should be protected from development based on fish and wildlife concerns and a determination of how river values (fish, wildlife, recreation, cultural, natural features and institutions) will affect hydro development.

The Hydro Assessment Study will consider all rivers and streams at least as far upstream as to include all hydro sites which have been proposed or that have been identified by the Corps of Engineers as potential sites. Tributaries as will be

included to the extent needed to characterize their relative significance to river values.

The duration of the study will be less than 15 months and will cost an estimated $1.5 million (see Sections VIII and IX, respectively).

II. SITE RANKING AND PROTECTED AREAS

Purpose. The Council is required to develop a program to protect, mitigate and enhance fish and wildlife affected by hydropower facilities in the Columbia River Basin (Section 4(h) of the Northwest Power Act). New hydroelectric development has the potential to affect adversely fish and wildlife by impeding migration or causing loss of habitat or may be beneficial by improving flows or water temperatures. Consequently, new hydro will have a spectrum of impacts -- some will be less desirable than others.

The 1982 Columbia River Basin Fish and Wildlife Program commits the Council to designate steam reaches and wildlife habitat areas to be protected from further hydroelectric development (Section 1204(c)(2)). In its 1983 Northwest Conservation and Electric Power Plan, the Council committed itself to ranking hydro sites into three categories based on their likely impacts on fish and wildlife (Action Item 14.2). The purpose of this study is to help provide the data needed to fulfill these commitments.

The Council is required by the Regional Power Act to prepare a power plan which includes a forecast of power resources (Section 4(d) and (e)). In its 1983 Northwest Conservation and Electric Power Plan, the Council identified new hydroelectric power plants as the preferred source of new power next to conservation. Estimates of the amount of cost-effective power available in the Northwest ranged from 400 to 4,000 megawatts. The purpose of this study is to provide a reliable basis for future estimates of hydro availability.

Site ranking and protected area designations will be based in part on the existing and potential productivity of each stream reach containing anadromous fish, and their significance to tribal entities. Productivity is defined in terms of three factors: smolt production, migration use, and upstream geography which may affect downsteam anadromous fish areas through sedimentation. This study will quantify the smolt productivity of each stream reach. Migration will be accounted for by including upstream productivity in any estimate of smolt production for an individual stream reach. The productivity will be accumulated as one moves down a stream. Stream reaches upstream or anadromous fish areas which have the potential to affect adversely downstream use will be identified quantitatively.

For site ranking and protected area designations for resident fish and wildlife, the Council will rely on state estimates of the value of stream reaches as discussed below in Sections IV.

Concept. One way to rank hydro sites and to designate protected areas would be to design a hydro project for each stream reach, evaluate its impact on fish and wildlife as would be done in the licensing process, then rank and designate sites based on the degree of impact. Such an effort would be expensive. The Council has selected a less costly substitute. The Council will make its decisions based on an estimate of the fish and wildlife resource values for each stream reach. The impacts of hydro development are assumed to be uniform from site to site.

A hydro supply curve (a graph showing the amount of new hydro available as a function of cost) will be developed by recognizing the various constraints which will reduce the theoretical hydro potential of the region. Constraints include Council actions to protect, mitigate and enhance fish and wildlife in the region and actions by public, federal, state and local decisionmakers.

The theoretical hydro potential of the region and its cost currently is being assessed by the Corps of Engineers and the Bonneville Power Administration with

assistance from the Council through a contract with Ott Engineers. Council actions which will affect hydro will be determined as described in Section VI. The degree to which other decisionmakers may affect new hydro will be assessed as described in the following subsection. The Council staff will collect information from these sources and recommend to the Council an appropriate hydro supply curve.

The Council will not make value judgments on its own as to the significance of resources identified by state, federal and tribal decisionmakers or to the likelihood of those resources resulting in negative decisions on hydro projects. The Council will not arbitrate differences among decisionmakers. For purposes of its supply curve, the Council is only interested in learning where others will resist hydro development so that the Council has an accurate estimate of the amount of available cost-effective hydropower. Decisionmakers who may affect hydro development include licensing agencies (federal, state and local), those that may influence licensing agencies (public, tribes, and resource managers), and resource/land managers (federal and state).

The Council could obtain one level of understanding of decisionmakers' influence on new hydro by simply compiling existing decisions. The decisions, called institutional constraints, are usually generic determinations which restrict hydro development. Examples could include federal wilderness designations, state and federal wild and scenic river designations or local zoning ordinances. These constraints need to be identified, but further efforts are needed because the decisionmakers many times do not take a prospective view, but rather tend to make decisions on a case-by-case basis. Consequently, decisionmakers may impose further constraints at the time new hydro is actually proposed for consideration.

It is the Council's intent to anticipate the reaction of the decisionmakers to new hydro by asking them to categorize stream reaches in terms of their significance for river values. River values include resident fish, wildlife, recreation,

cultural values (e.g., historic and archaeologic) and natural features (e.g., endangered and threatened plants). The information will be collected from the decisionmakers by the four states, except that Indian cultural and archaeologic values will be assessed by the tribes.

III. ANADROMOUS FISH ASSESSMENT

This section identifies the method for quantifying productivity of stream reaches which may support anadromous fish. The study will be expected to:

1. Estimate the amount of existing productivity for each stream reach by:

    a. species,
    b. number of smolts, and
    c. wild or natural fish.

2. Estimate the amount of potential productivity for each stream reach by:

    a. identifying how much the existing levels identified in Step 1 could be increased;

    b. describing in general what actions are needed to achieve these higher levels.

3. Identify the potential location of hatchery production and releases and the number of smolts released. Both existing and potential releases should be identified.

The existing productivity is an observable fact. However, data may not be on hand. During the study process, decisions will be made as to what techniques should be used to estimate missing data and to collect such data within the constraints of the budget and schedule.

The potential productivity of each stream reach and each species will be calculated in number of smolts (migrants) that could be produced at full seeding. It will be based on estimated spawning and rearing area and average production values (per unit area) determined from existing information sources. This measure of maximum natural smolt production is designed to quantify each system's maximum carrying capacity or smolt production potential if limiting factors, other than those

inherent in calculation or average production values, were removed. Subsequently, those other limiting factors will be considered. In some cases it may be useful to consider adult use of stream reaches to characterize their importance.

Stream productivity will be estimated by the following steps:

Step 1. Review existing literature on salmon/steelhead smolt production per unit area. Identify the habitat characteristics and limiting factors in operation for each applicable study and develop a format for correlating habitat characterization and species with average production values. Habitat characterization should be generalized and based only on the most critical elements of productivity.

Step 2. Compare the above attributes from relevant productivity studies to habitat classification for each basin and species (Step 5), and, to the extent possible, determine the productivity value(s) that apply to each basin or subbasin and species.

Step 3. Review the literature and consult the involved fisheries entities and land management agencies to determine the most appropriate unit of measurement for quantification of spawning and rearing habitat. The unit of measurement should lend itself readily to the application of production factors previously identified.

Step 4. Survey the involved fisheries entities and determine the appropriate species for consideration in each river basin or appropriate subbasin.

Step 5. Survey all appropriate fisheries entities and land management agencies for existing habitat inventory data. Review the available data and determine the most appropriate method(s) for estimating and displaying the quantity and classification of spawning, rearing, and adult use area quality between and within river basins or subbasins. Implement the methodology determined above and/or use maps, aerial photographs, and flow records in conjunction with local fisheries personnel (where other more specific information is unavailable) to estimate the

size and classify the relative habitat quality of spawning and rearing areas for each basin and for each appropriate species.

The following are the only areas not to be considered in measuring spawning and rearing habitat: the areas upstream from Chief Joseph, Hells Canyon, Dworshak, Round Butte, Lookout Point, Detroit, Mossyrock, Merwin, Tieton, Bumping and McKay dams and the habitat currently inundated by operational hydroelectric dams. Areas above upstream passage blocks should be included, and optimum flows should be used in calculating the spawning and rearing capacity of overappropriated streams. Limiting factors are itemized and will be used elsewhere to reduce the maximum potential obtained in this section of the study. Other innate constraints to production potential (e.g., summer-winter flows stream geomorphology, etc.) should be identified and addressed for each basin or appropriate subbasin, and incorporated into the assessment of spawning and rearing areas.

Step 6. Develop a numerical estimate of maximum smolt production potential for each river reach and applicable species using the data generated on quantity and quality of spawning and rearing areas and smolt production per unit of area.

Step 7. Productivity estimates resulting from the above steps will provide a maximum migrant output number for each basin and stock. This number will be generated without consideration of outside factors that could limit maximum productivity. Consideration of these limiting factors which could prevent realization of potential productivity is essential and will be provided to the extent feasible.

For quantifiable limiting factors, such as dams, flows, natural barriers and spawning constraints, esitmates will be made of their total contribution to the reduction of production potential for each basin and stock. Estimates shall be made on the basis of existing information. For non-quantifiable limiting factors, such as

disease, genetics, competition, riparian habitat loss, pollution, etc., a method for determining their relative influence will be developed. Since there is insufficient information on direct fish loss resulting from these factors, the relative magnitude of the effect of each factor will be defined general terms of worst to least.

Step 8. Identify existing and potential hatchery production and release points.

Step 9. Identify stream reaches which are uniquely significant to tribal entities. The Council will contract with an appropriate entity or individual to request the tribes to present an independent assessment of how Indian cultural and archaeological values would be affected by hydro development. Historically, Indian values have been closely associated with rivers because they frequently lived adjacent to them. Their cultural and archaeological values will be affected uniquely by hydro development. Information about how these values may be affected could be sensitive, if religion-based. The Council contractor will work with the tribes of the Northwest to identify how Indian cultural and archaeological values may be affected by new hydro development. The results of this assessment would be held confidential by the tribes for use only by the Council and its staff.

IV. NON-ANADROMOUS FISH ASSESSMENT

The objective of this portion of the Hydropower Assessment Study is to identify the signficance of stream reaches for several river values. Comparative assessment is the major feature of the process. The result is not rivers ranked in numerical order; rather, it is a clustering of stream reaches into general groups according to their significance. To ensure objectivity all streams are evaluated without regard to special development proposals (i.e., the assessment is blind to proposed hydro development). The process does not require collection of field data. The emphasis is on the use of existing information, expert evaluation, and user and public input.

The method consists of the following steps:

1. Refine criteria to be used to categorize the importance of stream reaches for each river value. The following river values will be evaluated:

Resident Fish

-- cold water
-- warm water

Wildlife

-- migratory
-- resident birds
-- big game
-- furbearers
-- small mammals
-- endangered and threatened species (federal and state)

Natural Features

-- endangered and threatened plants
-- unique plant communities and other recognized natural areas
-- undeveloped segments
-- free-flowing segments
-- scenic corridors
-- sensitive riparian wetlands
-- gorges, waterfalls, rapids, miscellaneous geologic features
-- slope stability

Social/Cultural Features

-- archaeological sites
-- river related architectural sites
-- miscellaneous heritage sites
-- historic trails
-- current Indian cultural use sites
-- current public use sites

Recreation

-- white water boating
-- flat water boating
-- river camping
-- miscellaneous water-based recreation
-- sport fishing

Institutional Constraints

-- roads and transmission line
-- wild and scenic rivers
-- wilderness areas

-- research natural areas
-- national parks
-- unroaded areas
-- state and local statutory and administrative constraints

For each river value identified above the states will identify criteria by which data will be evaluated for significance. Both quantitative and qualitative criteria may be employed as appropriate. The terms highest significance, high significance, moderate signficance, limited significance and no significance will be used to denote relative value. An effort will be made to standardize criteria among the states. The Hydropower Assessment Steering Committee (HASC), an advisory committee to the Council, will comment on the criteria. Each state will consider these recommendations in adapting the study methodology to meet individual state needs. Consistency among the states will be facilitated throughout the process by the HASC and BPA.

Unless HASC develops recommended alternative criteria by November 15, 1984, the following criteria will be used:

Wildlife: "Application of Wildlife Values to Montana's Stream Classification System. (Copies available on request.)

Resident Fish: "Montana Department of Fish, Wildlife and Parks Procedure for Classifying Montana Streams," Spring 1980. (Copies available on request.)

Other Values: "Maine Rivers Study," May 1982.

2. Evaluate the significance of each stream reach for each river value. The final result of the category assessment will be the identification of all river areas which should be recognized for possessing a particular fisheries, wildlife, natural, recreational, or cultural value and an identification of the relative significance of each area. The assessment should include the identification of existing facilities, such as roads and transmission lines.

3. Document the results of the evaluation. Results will be displayed in tabular form and also recorded on base maps at an appropriate scale for each river

value. Where available and applicable, a scale of 1:24,000 will be used. The basis for the results will be recorded in narrative form for each river segment or segments. Maps of a scale suitable for public presentation also will be developed. Information regarding sensitive fish and wildlife, plants and archaeological sites will be displayed in accordance with state and tribal policy and conservation of these resources.

Information obtained for all river values will be combined. All significant values associated with a given stream will be identified and all tributaries which contribute to these values will be noted. A matrix format will be used as the mechanism for displaying this information. The matrix will identify the total number of values associated with each steam reach and will indicate the significance ratings.

4. Review Indian cultural and archaeological values. Indian values will have an important impact on new hydro development. Tribes will be a full partner in the anadromous fish assessment described in Section IV. Tribes will provide information in the non-anadromous fish assessment through the states (but not modified by the states) that will affect river values identified in steps 1, 2 and 3 above.

V. STUDY RECOMMENDATIONS AND PUBLIC INVOLVEMENT

Recommendations will be made to the Council by its staff for site ranking, protected areas and hydro supply curves. These recommendations will be made based on data collected from the anadromous fish assessment, Indian cultural and archaeological values assessment, non-anadromous fish assessment, and hydro supply and cost data from the Corps of Engineers, BPA and Ott Engineers.

Protected area designations will be based on habitat, productivity and migration considerations, as well as on the value of stream reaches to tribes. For

remaining areas, site ranking will be based on the same information in addition to data specific to a hydro project and judgments as to what criteria distinguish among Categories I, II and III sites as defined in the Council's Power Plan. The hydro supply curve will take into account protected area designations and site ranking decisions. It also will reflect the acceptability of access roads and transmission line corridors based primarily on wilderness/roadless areas, wildlife habitat and slope stability.

Upon receipt of recommendations from the staff, the Council will propose appropriate amendments to its Power Plan and Fish and Wildlife Program. These proposed amendments will be reviewed through the Council's usual public process, including formal public hearings in each of the four states. Hearings in each state will be held jointly with the states. During the hearings, interested persons, agencies and tribes also may make proposals for site ranking, protected areas and hydro supply curves.

The public will also have input in the development of the study data through attendance and participation at meetings of HASC and at the state level. These meetings will be announced through a coordinated state/Council effort.

Once a hydro supply curve, site ranking and protected area designations have been adopted, changes can be proposed, considered and acted upon, based on new information, in the context of the Council's process for amendments of its plan and program.

VI. ORGANIZATION

The Council's Hydropower Assessment Steering Committee (HASC) will review and make recommendations for the Hydropower Assessment Study. HASC will review periodically participant progress at key milestones. BPA will coordinate the four state-level assessments with HASC and will administer contracts with the participants.

The Indian cultural and archaeological values study will be performed by direct contract between the Council staff and an appropriately qualified contractor.

The anadromous fish assessment will be managed by the Council using an outside contractor. The coordinator will coordinate agreements, if possible, between the various agencies and tribes on technical matters (methods and techniques) and facilitate collection, either directly or by subcontract, of needed data. If BPA provides funds for this effort, it will retain its statutory responsibilities for contract administration in accordance with existing agreements between BPA and the Council.

The non-anadromous fish assessment will be conducted at the state level by a task force under the leadership of a study coordinator. A regional coordinator for this portion of the study will assist the state task force. The study is designed to produce consistent results by use of common evaluation criteria. The state task force will consist of state, federal and tribal authorities and will be comprised of technical experts with river resource expertise. The state task force should include cognizant state agencies, local jurisdictions to the extent it is possible and consistent with a local government jurisdiction over hydro within the state, National Marine Fisheries Service, U.S. Fish and Wildlife Service, Bureau of Land Management and the U.S. Forest Service.

Figure 1 shows the regionwide organization and Figure 2 shows the state organization. The roles and responsibilities of each group are defined below.

Figure 1:

ORGANIZATION CHART: REGIONAL LEVEL

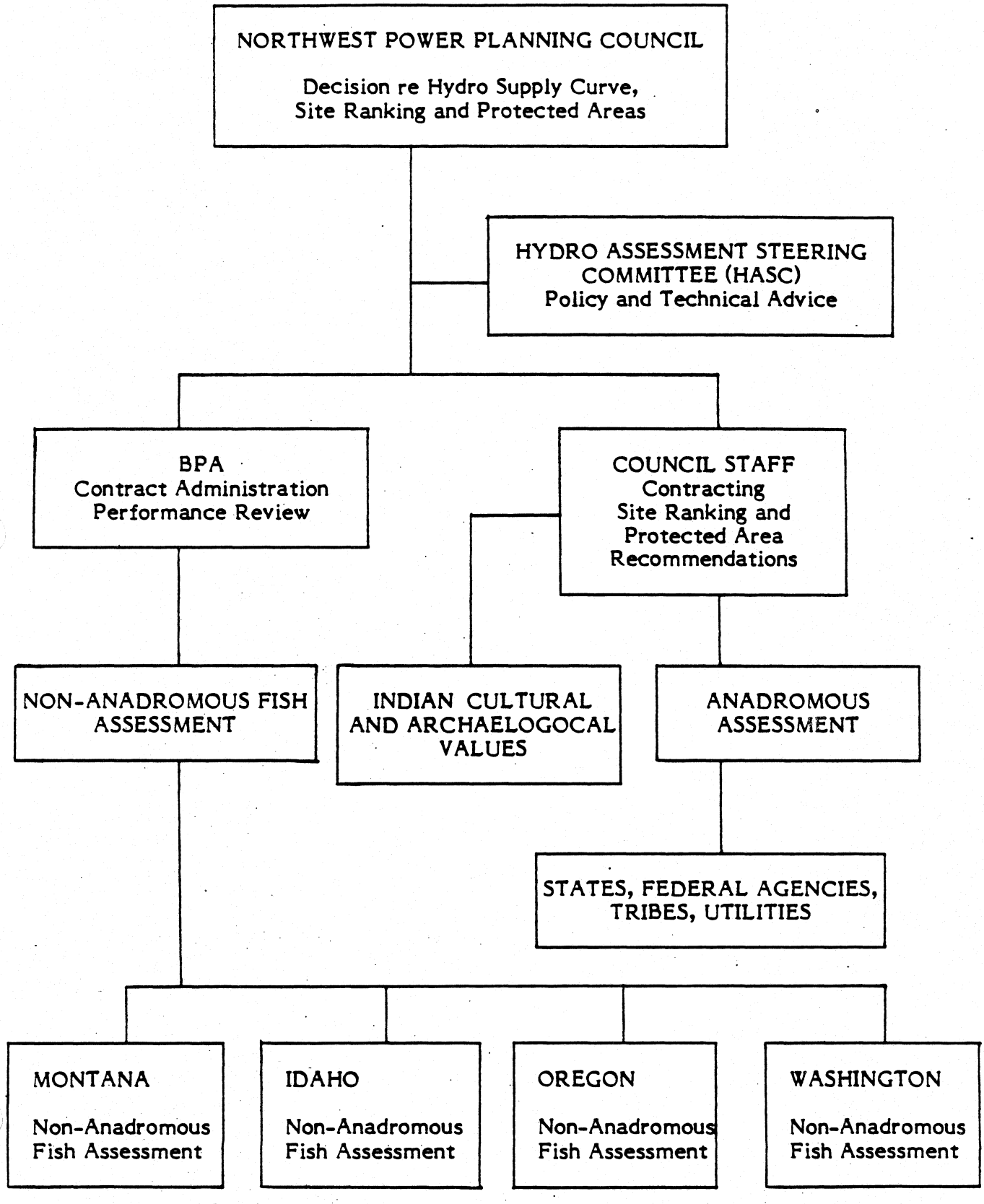
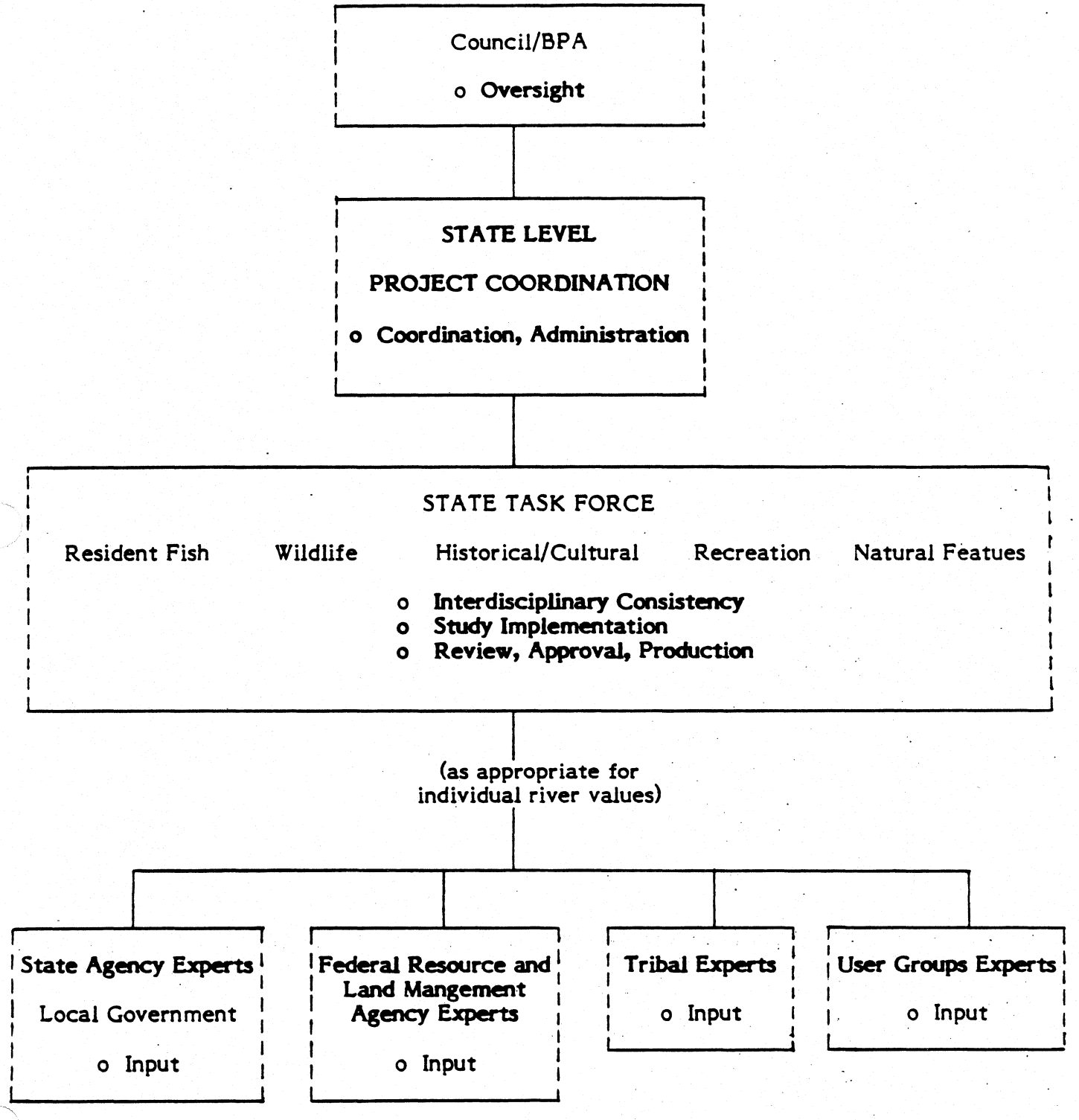


Figure 2

ORGANIZATION CHART: STATE LEVEL



State level study organization will be designated to meet individual circumstances.

1. Northwest Power Planning Council

   Determine final uses of study results.

2. Council staff

   a. Coordination of Hydropower Assessment Steering Committee activities.

   b. Manage anadromous fish assessment.

   c. Manage contract for Indian cultural and archaeological values.

   d. Propose and implement overall public information/involvement strategy.

   e. Recommend hydro supply curve, protected area and site ranking decisions to Council.

3. Hydropower Assessment Steering Committee (HASC)

   a. Recommend study direction, including recommendaton on study method and criteria.

   b. Review participant progress and products.

4. Bonneville Power Administration

   a. Administer contracts with state studies for non-anadromous fish assessment.

   b. Coordinate for HASC review consistent regionwide criteria for non-anadromous fish values.

   c. Develop data management system for all study products.

   d. Print all study documents and maps.

   e. Participate on HASC.

5. States (Oregon, Washington, Idaho and Montana)

   a. Perform non-anadromous fish assessment.

   b. Coordination of the study with HASC and BPA and federal resource/land management agencies, Indian tribes and local government.

   c. Participate on HASC.

   d. Participate in anadromous fish assessment.

6. Indian Tribes

   a. Perform assessment of Indian cultural and archaeological values.

   b. Participate in anadromous fish assessment.

   c. Participate in state non-anadromous fish assessment.

   d. Participate on HASC.

7. Federal Resource and Land Management Agencies (U.S. Fish and Wildlife, U.S. Forest Service, U.S. Bureau of Land Management, National Marine Fisheries Service, Corps of Engineers)

   a. Participate in anadromous fish assessment.

   b. Participate in state non-anadromous fish assessment.

   c. Participate on HASC.

8. Pacific Northwest Utilities Conference Committee/Resource Developers

   Participate on HASC.

VII. SCHEDULE

The schedule for the hydro assessment study is shown in Figure 3.

VIII. BUDGET

An estimated budget for the Hydro Assessment Study follows.

Figure 3

PACIFIC NORTHWEST RIVERS STUDY
SCHEDULE OF PRODUCTS

	TASK	RESPONSIBLE PARTIES	COMPLETION DATES
1.	Approve work plan	Council	August 29-30, 1984
2.	Identify rivers to be studied	Council Staff	September 30, 1984
3.	Designate state coordinators	State Governors	September 15, 1984
4.	Complete contracts	Council/BPA	September 30, 1984
5.	Select anadromous fish assessment coordinator	Council Staff	September 1984
6.	Convene state task force	State Coordinator	October 15, 1984
7.	Adopt criteria for river values	BPA/State Task Force	November 15, 1984
8.	Prepare evaluation format and base maps for state use	BPA	December 30, 1984
9.	Indian cultural and archaeologic assessment	Council/Tribes	November-April 1985
10.	Anadromous fish assessment	HASC/Coordinator/ Agencies/Tribes	October-June 1985
11.	Perform river resource assessments	State Task Force	January-October 1985
12.	Publish results	BPA	November 1985
13.	Computerize river assessment	BPA	November 1985
14.	Overlay hydropower sites	Council Staff	November 1985
15.	Recommend supply curves	Council Staff	
16.	Recommend protected area designations	Council Staff	
17.	Recommend site ranking	Council Staff	

Figure 4

BUDGET

CONTRACT	CONTRACTOR	SOURCE OF FUNDS	AMOUNT
Indian cultural and archaeological values	To be determined	Council	$ 40,000[1]
Anadromous fish assessment	To be determined. (Sub-contracts with appropriate entities as necessary to collect data)	Council, supplemented by BPA as needed	500,000
Non-anadromous fish assessment	States[2] (Oregon, Washington Idaho, and Montana)	BPA	700,000
	Tribes		130,000
	Federal agencies		130,000
			$1,500,000

[1]This figure is based on the estimated time of one individual to coordinate this effort among more than 40 tribes and prepare reports. It is recommended by the Chairman of HASC.

[2]Including local governments.

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August 1, 1984

ISSUE PAPER
HYDROELECTRIC ASSESSMENT STUDY

ISSUE: Should the Council approve the proposal for a hydroelectric assessment study described in Attachments 1 and 2 as the basis on which the Council will designate protected areas, rank hydroelectric sites (including an interim ranking) and develop a hydropower supply curve?

INTRODUCTION

This attached issue paper describes a proposal for a hydroelectric assessment study which would help the Northwest Power Planning Council accomplish three objectives under its Columbia River Basin Fish and Wildlife Program and Northwest Conservation and Electric Power Plan. First, the study would provide information to help the Council designate areas to be protected from hydroelectric development in the Columbia River Basin. Second, it would provide the Council with information to be used in the hydropower site ranking process described in the Power Plan. Third, it would provide the information on environmentally-sound hydroelectric sites which the Council needs to improve the "hydropower supply curve" it uses in its Power Plan to project the amount of hydropower likely to be available to the region in the future. In each case the Council would consider information from this study of environmental values along with information on hydropower potential provided by other studies before making its decisions on protected areas, site ranking, and hydropower supply.

The hydroelectric assessment study proposal is based on the work of the Council's Hydropower Assessment Steering Committee (HASC) and Rivers Assessment Task Force (RATF) with the assistance of the Council staff and the National Park Service. HASC is composed of 16 members representing states, federal agencies, developers, utilities, and Indian tribes and has been meeting twice monthly since October 1983 to work on this proposal. RATF is composed of 19 members representing local governments as well as the aforementioned groups and has been meeting since May. Both groups meet in public and already have heard extensive public comments on their work.

The study proposal is outlined and analyzed in the issue paper and described in detail in Attachments 1 and 2. The proposed budget and schedule for the proposed study also are included. Major alternatives to the proposal are described as well.

The Council will accept written comments on the issue paper through 5 p.m. Tuesday, August 14. Comments should be addressed to Peter Paquet, Manager,

Project Operations and Development, at 700 S. W. Taylor Street, Suite 200, Portland, Oregon 97205. Oral comments will be taken at the Council meeting on August 9 in Kalispell, Montana and at the HASC/RATF meeting at 9 a.m. on August 14 in Portland, Oregon. The Council staff will review the comments and recommend a Council decision on the study proposal at the Council's August 29-30 meeting in Portland.

BACKGROUND

It is important for the Council to develop an overall approach to assess the hydropower potential of the region and to ensure that its development will be consistent with the Council's responsibility to protect, mitigate and enhance the fish and wildlife resources of the Columbia River Basin.

Measure 1204(c)(1) of the Council's Fish and Wildlife Program calls on Bonneville, upon approval by the Council, to conduct a study which will provide the basis for designating certain streams and wildlife habitat in the Columbia River Basin to be protected from future hydroelectric development. Based on the results of that study, the Council, pursuant to Measure 1204(c)(2) of the program, will designate such protected areas. Action item 14.2 of the Council's Northwest Conservation and Electric Power Plan states that the Council will design a study to identify and rank potential hydropower sites throughout the region based on fish and wildlife concerns. Action item 14.3 calls on the Council to continue its efforts to refine the data base on existing and potential hydropower sites that are environmentally sound and cost effective. The HASC was established by the Council to advise the Council on the coordination of these actions.

In April and May of this year, the Council staff presented to the Council a draft prospectus for carrying out a Northwest rivers assessment study. As a result of these presentations, the Council authorized the formation of the Rivers Assessment Task Force (RATF) and directed it to help develop a work plan for a river assessment study that would meet the Council's needs for supply curve estimates, site ranking and protected area designation.

Over the last two months the RATF, in consultation with the HASC, has identified various steps and options likely to be necessary to meet the Council's needs as defined in the Fish and Wildlife Program and the Power Plan. This issue paper provides a synthesis of these steps and options.

BUDGET/ECONOMIC IMPACTS

The proposed maximum cost of this study is $1.2 million. Of that amount, $243,000 is expected to come from FY 1984 Council funds already for hydro assessment studies. The remainder would come from Bonneville funds that have been budgeted for a protected areas study and for supply curve estimates. A breakdown of expenditures is included in Attachment 1.

ANALYSIS

The policy issues that need Council action at this time to initiate the hydroelectric assessment studies are described below.

A. Protected Area Designation and Site Ranking.

For anadromous fish, the proposed study would characterize stream reaches on the basis of their productivity and their significance to tribal entities. The data for this characterization would be provided by the fish and wildlife agencies and tribes. HASC would help ensure consistency of the data. Once productivity has been established, the Council staff would review the data and prepare recommendations to the Council on alternative uses of that data to establish "break points" for designating protected areas and for ranking hydropower sites among the three categories specified in the Power Plan.

For resident fish and wildlife the process described below under "Hydro Supply Curve" would be used to provide the data which again would allow the Council staff to recommend alternative "break points" for protected areas and site ranking.

Alternatives to characterizing the value of rivers to anadromous fish based on productivity include:

1. Making the policy decision now that until past damage by the hydro system is corrected, no new hydro should be developed on streams with anadromous fish, either currently or potentially. The advantage of this approach is that it ensures that no means for protecting, mitigating, or enhancing the anadromous fisheries of the Columbia River Basin would be foreclosed by new hydrodevelopment. This kind of decision would preclude essentially any new hydroelectric development on the Columbia River and its tributaries for an indefinite period of time. It is conceivable that nothing ever could be developed if past damage by the hydro system cannot be corrected. Following this approach, no recognition would be given to specific project types, some of which may have no impact or positive impacts on fish and wildlife.

2. Adopting criteria for Categories I, II, and III, as proposed or as modified, then allowing fish and wildlife agencies and tribes to apply the criteria. This alternative would provide a rapid method for categorizing proposed projects. However, it would be difficult to develop criteria for Category II sites (sites which have significant impacts on fish and wildlife that can be mitigated) without having some sort of review process for evaluating individual projects.

3. Asking the fish and wildlife agencies to use their judgment as to the significance of each stream reach for anadromous fish. This alternative is analogous to the process used by the fish and wildlife agencies and tribes in making their original recommendations to the Council for protected areas in the Columbia Basin. It has the advantage of being rapid and inexpensive, but it could result in nonuniform recommendations which would not be based on common criteria.

B. Interim Report on Project Ranking.

The above action will not be completed for a year or more. In the interim, the Federal Energy Regulatory Commission (FERC) and developers will be making decisions on new hydro projects. Some of these decisions may foreclose further

Council action, particularly for anadromous and migratory resident fish where a project may have an impact beyond its immediate area. Therefore, it may be useful for the Council to make an interim statement on new hydro.

There is disagreement about how interim ranking should be accomplished. Originally the HASC tried to reach consensus on criteria which would further distinguish between sites which have insignificant impacts (Category I) and those that have significant impacts (Category III). Attachment 2 lists criteria based on proposals by HASC members. The difficulty with Attachment 2 is largely that Category III is imprecise as to what levels of habitat loss or downstream migrant loss is acceptable.

As an alternative, the Pacific Northwest Utilities Conference Committee (PNUCC) suggested that fish and wildlife agencies and tribes apply the criteria listed in Attachment 2 to identify only those sites which are acceptable for development (Category I). It was implied that in the interim no Council statement would be made about non-Category I sites. Fish and wildlife agencies and tribes believed that this approach would be inequitable because, while sites were open for development, no commitment was made to BPA to protect sensitive habitat.

Another alternative, contained in the proposed study, would apply only the criteria for Category I sites listed in Attachment 2 to identify Category I sites, i.e., those hydro projects which the Council believes can be developed without further study of their impacts on anadromous and migratory resident fish. The proposed criteria are conservative in that they probably overprotect the anadromous and migratory resident fish resources. It is anticipated that the study described above would identify additional Category I sites.

The Council staff believes that simply identifying Category I sites alone on an interim basis may be insufficient without a statement about other stream reaches which contain anadromous or migratory resident fish. It recommends that the Council should state that development of Category I sites will not adversely affect anadromous and migratory resident fish. Development at other sites should not proceed until completion of the above study to identify protected areas and each site. The staff also proposes that at the time the Council adopts an interim ranking, it should also request that FERC provide an extension of preliminary permit and license applications until the Council completes its broader study. In addition, the staff believes the Council should state that the interim ranking will expire one year after adoption whether or not the broader study is completed.

ALTERNATIVES

1. No interim ranking. This is attractive because power and fish interests cannot reach agreement, and the Council otherwise would be placing itself between these groups to solve a problem which will have to be addressed with once again in one year at the end of the Hydroelectric Assessment Study. The argument against the no action alternative is that the Council will have existed for nearly five years before providing clear guidance for new hydro development.

2. Identify developable sites only. This approach may demonstrate to developers that some new hydro can be built. However, fish and wildlife interests are given no equivalent assurances that fish and wildlife resources will be protected.

3. Adopt but not apply criteria. The Council could adopt the proposed criteria and let others use them as a means of choosing suitable projects. However, other than Category I, criteria themselves are controversial; thus, greater consensus is not achieved. Further, each group could apply the criteria differently which would result in no clearer direction to FERC.

4. Ranking by fish and wildlife agencies and tribes of all sites into Categories I through III. The difficulty with this approach is that criteria are not agreed upon sufficiently to avoid widely varying judgments. Without unequivocal criteria, it would be difficult for agencies and tribes to allow hydro development on anadromous and migratory resident fish streams.

C. Hydro Supply Curve.

A realistic estimate of hydropower development will be developed by identifying the electrical capability and cost of all protected hydro projects in the Northwest (to be supplied by work currently underway by the Corps of Engineers, the Bonneville Power Administration, and the Council), then reducing this estimate by an amount consistent with the Council's designation of protected areas and site ranking. The estimate will be reduced further by actions of federal land managers (Bureau of Land Management and U. S. Forest Service), licensing agencies (federal, state and local), resource managers (fish and wildlife, historic and archeology, recreation, etc.), and the public. The purpose of this portion of the Hydroelectric Assessment Study would be to evaluate the impact of the decisions of these entities on hydro availability. The Council would use this information to obtain a realistic estimate of hydropower; it would not substitute its judgment for that of the other decisionmakers on whether a resource could be developed.

The process for collecting the views of the decisionmakers has three elements: (1) The states would compile, but not screen, the views of all the institutional decisionmakers; (2) Decisionmakers would be asked to respond in a way that allows interstate comparisons; and (3) The public would be asked to participate in Council hearings held jointly with the decisionmakers.

Step 1 envisions a state-managed approach. Two exceptions are proposed — anadromous fish would be treated regionally. So would Indian cultural values. Because Indian cultural values are unique and sensitive, the staff believes they should be considered by direct arrangement with the Council.

Step 2 would ask each decisionmaker to identify the significance of each stream for several river values as is appropriate to the responsibility of each. River values to be considered would be institutional (e.g., Wild and Scenic Rivers), resident fish, wildlife, recreation, cultural (e.g., historic and archeological), and natural features. The net result of information from all decisionmakers would be one or more statements about the significance of each river value for each stream. From this data the Council can judge the likely impacts on hydro development.

Alternatives to this approach include:

1. Regional approach. An alternative to the state-managed approach (except for anadromous fish and Indian cultural values) would be a regional approach. The tribes and some federal agencies have indicated that they prefer this approach.

However, the staff believes that, except for anadromous fish and Indian cultural values, the other resources that are proposed for study are for the most part under control of the states, and therefore, the staff believes it is appropriate that the states make recommendations to the Council.

2. No action. This alternative appears to be unsatisfactory since the Council needs to address the role of new hydro, both in terms of fish and wildlife impacts and as a new energy resource.

3. Rely on the original recommendations of the fish and wildlife agencies and tribes for protected areas. The Council already rejected these recommendations based on the fact that they were incomplete and not based on a uniform approach.

4. Site-by-site approach. Following this alternative, the Council would undertake a detailed analysis of each proposed and potential hydro site identified in the Regional Data Base. This does not appear to be feasible due to the large number of sites (over 2,000) and the cost that would be involved.

D. Relationship to other Council studies.

The Council has called for a "goals" study (Program Section 201) and a cumulative impact study (Section 1204). Neither of these studies has been initiated, so it is not possible to ensure that the Hydroelectric Assessment Study is consistent. However, the Hydroelectric Assessment Study has been designed so that it stands independent of whether these other studies proceed and so that it can be adjusted to be compatible with a range of possible approaches to these other studies.

Attachment 1

PACIFIC NORTHWEST HYDRO ASSESSMENT STUDY

WORK PLAN

Prepared By

THE NORTHWEST POWER PLANNING COUNCIL
700 S.W. Taylor
Portland, Oregon 97205

August 1984

Note: This proposed work plan describes the general framework of the study. More detailed work statements (identifying all specific work products and deadlines, for example) will be prepared to aid contracting. The work statement will be consistent with the work plan.

PACIFIC NORTHWEST HYDRO ASSESSMENT STUDY

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I. INTRODUCTION

The Pacific Northwest Hydro Assessment Study will develop data from which the Northwest Power Planning Council will address new hydroelectric development in the region. The Council plans to determine how much cost-effective hydro is realistic within the region for the purpose of updating its power plan. It also plans to rank hydroelectric sites throughout the region on the basis of their effects on fish and wildlife values and to designate areas to be protected from future hydro development on the basis of fish and wildlife values and hydropower potential.

In its initial consideration of hydropower availability, the Council was presented with estimates ranging from 400 to 4,000 megawatts. This study will help provide a more factual basis for estimating hydro availability, but it will not answer all questions. This study does not review hydro sites with the same rigor as will be done in the licensing process. It does attempt to anticipate the results of the licensing process through use of relatively simple surrogate techniques. This work is done in a way that future work can build on it, if such need is identified.

The Hydro Assessment Study would provide the Council with information to aid in:

- o determination of the theoretical potential of hydro and its cost by characterization of both proposed and potential sites (work by the Corps of Engineers, Bonneville Power Administration and the Council is currently underway);
- o ranking of hydro sites and designation of areas which should be protected from development based on fish and wildlife concerns and a determination of how river values (fish, wildlife, recreation, cultural, natural features and institutions) will affect hydro development.

The Hydro Assessment Study will consider all rivers and streams at least as far upstream as to include all hydro sites which have been proposed or that have been identified by the Corps of Engineers as potential sites. Tributaries as will be

included to the extent needed to characterize their relative significance to river values.

The duration of the study will be less than 15 months and will cost an estimated $1.5 million (see Sections VIII and IX, respectively).

II. SITE RANKING AND PROTECTED AREAS

Purpose. The Council is required to develop a program to protect, mitigate and enhance fish and wildlife affected by hydropower facilities in the Columbia River Basin (Section 4(h) of the Northwest Power Act). New hydroelectric development has the potential to affect adversely fish and wildlife by impeding migration or causing loss of habitat or may be beneficial by improving flows or water temperatures. Consequently, new hydro will have a spectrum of impacts -- some will be less desirable than others.

The 1982 Columbia River Basin Fish and Wildlife Program commits the Council to designate steam reaches and wildlife habitat areas to be protected from further hydroelectric development (Section 1204(c)(2)). In its 1983 Northwest Conservation and Electric Power Plan, the Council committed itself to ranking hydro sites into three categories based on their likely impacts on fish and wildlife (Action Item 14.2). The purpose of this study is to help provide the data needed to fulfill these commitments.

The Council is required by the Regional Power Act to prepare a power plan which includes a forecast of power resources (Section 4(d) and (e)). In its 1983 Northwest Conservation and Electric Power Plan, the Council identified new hydroelectric power plants as the preferred source of new power next to conservation. Estimates of the amount of cost-effective power available in the Northwest ranged from 400 to 4,000 megawatts. The purpose of this study is to provide a reliable basis for future estimates of hydro availability.

Site ranking and protected area designations will be based in part on the existing and potential productivity of each stream reach containing anadromous fish, and their significance to tribal entities. Productivity is defined in terms of three factors: smolt production, migration use, and upstream geography which may affect downsteam anadromous fish areas through sedimentation. This study will quantify the smolt productivity of each stream reach. Migration will be accounted for by including upstream productivity in any estimate of smolt production for an individual stream reach. The productivity will be accumulated as one moves down a stream. Stream reaches upstream or anadromous fish areas which have the potential to affect adversely downstream use will be identified quantitatively.

For site ranking and protected area designations for resident fish and wildlife, the Council will rely on state estimates of the value of stream reaches as discussed below in Sections IV.

Concept. One way to rank hydro sites and to designate protected areas would be to design a hydro project for each stream reach, evaluate its impact on fish and wildlife as would be done in the licensing process, then rank and designate sites based on the degree of impact. Such an effort would be expensive. The Council has selected a less costly substitute. The Council will make its decisions based on an estimate of the fish and wildlife resource values for each stream reach. The impacts of hydro development are assumed to be uniform from site to site.

A hydro supply curve (a graph showing the amount of new hydro available as a function of cost) will be developed by recognizing the various constraints which will reduce the theoretical hydro potential of the region. Constraints include Council actions to protect, mitigate and enhance fish and wildlife in the region and actions by public, federal, state and local decisionmakers.

The theoretical hydro potential of the region and its cost currently is being assessed by the Corps of Engineers and the Bonneville Power Administration with

assistance from the Council through a contract with Ott Engineers. Council actions which will affect hydro will be determined as described in Section VI. The degree to which other decisionmakers may affect new hydro will be assessed as described in the following subsection. The Council staff will collect information from these sources and recommend to the Council an appropriate hydro supply curve.

The Council will not make value judgments on its own as to the significance of resources identified by state, federal and tribal decisionmakers or to the likelihood of those resources resulting in negative decisions on hydro projects. The Council will not arbitrate differences among decisionmakers. For purposes of its supply curve, the Council is only interested in learning where others will resist hydro development so that the Council has an accurate estimate of the amount of available cost-effective hydropower. Decisionmakers who may affect hydro development include licensing agencies (federal, state and local), those that may influence licensing agencies (public, tribes, and resource managers), and resource/land managers (federal and state).

The Council could obtain one level of understanding of decisionmakers' influence on new hydro by simply compiling existing decisions. The decisions, called institutional constraints, are usually generic determinations which restrict hydro development. Examples could include federal wilderness designations, state and federal wild and scenic river designations or local zoning ordinances. These constraints need to be identified, but further efforts are needed because the decisionmakers many times do not take a prospective view, but rather tend to make decisions on a case-by-case basis. Consequently, decisionmakers may impose further constraints at the time new hydro is actually proposed for consideration.

It is the Council's intent to anticipate the reaction of the decisionmakers to new hydro by asking them to categorize stream reaches in terms of their significance for river values. River values include resident fish, wildlife, recreation,

cultural values (e.g., historic and archaeologic) and natural features (e.g., endangered and threatened plants). The information will be collected from the decisionmakers by the four states, except that Indian cultural and archaeologic values will be assessed by the tribes.

III. ANADROMOUS FISH ASSESSMENT

This section identifies the method for quantifying productivity of stream reaches which may support anadromous fish. The study will be expected to:

1. Estimate the amount of existing productivity for each stream reach by:

   a. species,
   b. number of smolts, and
   c. wild or natural fish.

2. Estimate the amount of potential productivity for each stream reach by:

   a. identifying how much the existing levels identified in Step 1 could be increased;

   b. describing in general what actions are needed to achieve these higher levels.

3. Identify the potential location of hatchery production and releases and the number of smolts released. Both existing and potential releases should be identified.

The existing productivity is an observable fact. However, data may not be on hand. During the study process, decisions will be made as to what techniques should be used to estimate missing data and to collect such data within the constraints of the budget and schedule.

The potential productivity of each stream reach and each species will be calculated in number of smolts (migrants) that could be produced at full seeding. It will be based on estimated spawning and rearing area and average production values (per unit area) determined from existing information sources. This measure of maximum natural smolt production is designed to quantify each system's maximum carrying capacity or smolt production potential if limiting factors, other than those

inherent in calculation or average production values, were removed. Subsequently, those other limiting factors will be considered. In some cases it may be useful to consider adult use of stream reaches to characterize their importance.

Insert #A

Stream productivity will be estimated by the following steps:

Step 1. Review existing literature on salmon/steelhead smolt production per unit area. Identify the habitat characteristics and limiting factors in operation for each applicable study and develop a format for correlating habitat characterization and species with average production values. Habitat characterization should be generalized and based only on the most critical elements of productivity.

Step 2. Compare the above attributes from relevant productivity studies to habitat classification for each basin and species (Step 5), and, to the extent possible, determine the productivity value(s) that apply to each basin or subbasin and species.

Step 3. Review the literature and consult the involved fisheries entities and land management agencies to determine the most appropriate unit of measurement for quantification of spawning and rearing habitat. The unit of measurement should lend itself readily to the application of production factors previously identified.

Step 4. Survey the involved fisheries entities and determine the appropriate species for consideration in each river basin or appropriate subbasin.

Step 5. Survey all appropriate fisheries entities and land management agencies for existing habitat inventory data. Review the available data and determine the most appropriate method(s) for estimating and displaying the quantity and classification of spawning, rearing, and adult use area quality between and within river basins or subbasins. Implement the methodology determined above and/or use maps, aerial photographs, and flow records in conjunction with local fisheries personnel (where other more specific information is unavailable) to estimate the

size and classify the relative habitat quality of spawning and rearing areas for each basin and for each appropriate species.

The following are the only areas not to be considered in measuring spawning and rearing habitat: the areas upstream from Chief Joseph, Hells Canyon, Dworshak, Round Butte, Lookout Point, Detroit, Mossyrock, Merwin, Tieton, Bumping and McKay dams and the habitat currently inundated by operational hydroelectric dams. Areas above upstream passage blocks should be included, and optimum flows should be used in calculating the spawning and rearing capacity of overappropriated streams. Limiting factors are itemized and will be used elsewhere to reduce the maximum potential obtained in this section of the study. Other innate constraints to production potential (e.g., summer-winter flows stream geomorphology, etc.) should be identified and addressed for each basin or appropriate subbasin, and incorporated into the assessment of spawning and rearing areas.

Step 6. Develop a numerical estimate of maximum smolt production potential for each river reach and applicable species using the data generated on quantity and quality of spawning and rearing areas and smolt production per unit of area.

Step 7. Productivity estimates resulting from the above steps will provide a maximum migrant output number for each basin and stock. This number will be generated without consideration of outside factors that could limit maximum productivity. Consideration of these limiting factors which could prevent realization of potential productivity is essential and will be provided to the extent feasible.

For quantifiable limiting factors, such as dams, flows, natural barriers and spawning constraints, esitmates will be made of their total contribution to the reduction of production potential for each basin and stock. Estimates shall be made on the basis of existing information. For non-quantifiable limiting factors, such as

disease, genetics, competition, riparian habitat loss, pollution, etc., a method for determining their relative influence will be developed. Since there is insufficient information on direct fish loss resulting from these factors, the relative magnitude of the effect of each factor will be defined general terms of worst to least.

Step 8. Identify existing and potential hatchery production and release points.

Step 9. Identify stream reaches which are uniquely significant to tribal entities. The Council will contract with an appropriate entity or individual to request the tribes to present an independent assessment of how Indian cultural and archaeological values would be affected by hydro development. Historically, Indian values have been closely associated with rivers because they frequently lived adjacent to them. Their cultural and archaeological values will be affected uniquely by hydro development. Information about how these values may be affected could be sensitive, if religion-based. The Council contractor will work with the tribes of the Northwest to identify how Indian cultural and archaeological values may be affected by new hydro development. The results of this assessment would be held confidential by the tribes for use only by the Council and its staff.

IV. NON-ANADROMOUS FISH ASSESSMENT

The objective of this portion of the Hydropower Assessment Study is to identify the signficance of stream reaches for several river values. Comparative assessment is the major feature of the process. The result is not rivers ranked in numerical order; rather, it is a clustering of stream reaches into general groups according to their significance. To ensure objectivity all streams are evaluated without regard to special development proposals (i.e., the assessment is blind to proposed hydro development). The process does not require collection of field data. The emphasis is on the use of existing information, expert evaluation, and user and public input.

The method consists of the following steps:

1. Refine criteria to be used to categorize the importance of stream reaches for each river value. The following river values will be evaluated:

Resident Fish

-- cold water
-- warm water

Wildlife

-- migratory
-- resident birds
-- big game
-- furbearers
-- small mammals
-- endangered and threatened species (federal and state)

Natural Features

-- endangered and threatened plants
-- unique plant communities and other recognized natural areas
-- undeveloped segments
-- free-flowing segments
-- scenic corridors
-- sensitive riparian wetlands
-- gorges, waterfalls, rapids, miscellaneous geologic features
-- slope stability

Social/Cultural Features

-- archaeological sites
-- river related architectural sites
-- miscellaneous heritage sites
-- historic trails
-- current Indian cultural use sites
-- current public use sites

Recreation

-- white water boating
-- flat water boating
-- river camping
-- miscellaneous water-based recreation
-- sport fishing

Institutional Constraints

-- roads and transmission line
-- wild and scenic rivers
-- wilderness areas

-- research natural areas
-- national parks
-- unroaded areas
-- state and local statutory and administrative constraints

For each river value identified above the states will identify criteria by which data will be evaluated for significance. Both quantitative and qualitative criteria may be employed as appropriate. The terms highest significance, high significance, moderate signficance, limited significance and no significance will be used to denote relative value. An effort will be made to standardize criteria among the states. The Hydropower Assessment Steering Committee (HASC), an advisory committee to the Council, will comment on the criteria. Each state will consider these recommendations in adapting the study methodology to meet individual state needs. Consistency among the states will be facilitated throughout the process by the HASC and BPA.

Unless HASC develops recommended alternative criteria by November 15, 1984, the following criteria will be used:

Wildlife: "Application of Wildlife Values to Montana's Stream Classification System. (Copies available on request.)

Resident Fish: "Montana Department of Fish, Wildlife and Parks Procedure for Classifying Montana Streams," Spring 1980. (Copies available on request.)

Other Values: "Maine Rivers Study," May 1982.

2. Evaluate the significance of each stream reach for each river value. The final result of the category assessment will be the identification of all river areas which should be recognized for possessing a particular fisheries, wildlife, natural, recreational, or cultural value and an identification of the relative significance of each area. The assessment should include the identification of existing facilities, such as roads and transmission lines.

3. Document the results of the evaluation. Results will be displayed in tabular form and also recorded on base maps at an appropriate scale for each river

value. Where available and applicable, a scale of 1:24,000 will be used. The basis for the results will be recorded in narrative form for each river segment or segments. Maps of a scale suitable for public presentation also will be developed. Information regarding sensitive fish and wildlife, plants and archaeological sites will be displayed in accordance with state and tribal policy and conservation of these resources.

Information obtained for all river values will be combined. All significant values associated with a given stream will be identified and all tributaries which contribute to these values will be noted. A matrix format will be used as the mechanism for displaying this information. The matrix will identify the total number of values associated with each steam reach and will indicate the significance ratings.

4. Review Indian cultural and archaeological values. Indian values will have an important impact on new hydro development. Tribes will be a full partner in the anadromous fish assessment described in Section IV. Tribes will provide information in the non-anadromous fish assessment through the states (but not modified by the states) that will affect river values identified in steps 1, 2 and 3 above.

V. STUDY RECOMMENDATIONS AND PUBLIC INVOLVEMENT

Recommendations will be made to the Council by its staff for site ranking, protected areas and hydro supply curves. These recommendations will be made based on data collected from the anadromous fish assessment, Indian cultural and archaeological values assessment, non-anadromous fish assessment, and hydro supply and cost data from the Corps of Engineers, BPA and Ott Engineers.

Protected area designations will be based on habitat, productivity and migration considerations, as well as on the value of stream reaches to tribes. For

remaining areas, site ranking will be based on the same information in addition to data specific to a hydro project and judgments as to what criteria distinguish among Categories I, II and III sites as defined in the Council's Power Plan. The hydro supply curve will take into account protected area designations and site ranking decisions. It also will reflect the acceptability of access roads and transmission line corridors based primarily on wilderness/roadless areas, wildlife habitat and slope stability.

Upon receipt of recommendations from the staff, the Council will propose appropriate amendments to its Power Plan and Fish and Wildlife Program. These proposed amendments will be reviewed through the Council's usual public process, including formal public hearings in each of the four states. Hearings in each state will be held jointly with the states. During the hearings, interested persons, agencies and tribes also may make proposals for site ranking, protected areas and hydro supply curves.

The public will also have input in the development of the study data through attendance and participation at meetings of HASC and at the state level. These meetings will be announced through a coordinated state/Council effort.

Once a hydro supply curve, site ranking and protected area designations have been adopted, changes can be proposed, considered and acted upon, based on new information, in the context of the Council's process for amendments of its plan and program.

VI. ORGANIZATION

The Council's Hydropower Assessment Steering Committee (HASC) will review and make recommendations for the Hydropower Assessment Study. HASC will review periodically participant progress at key milestones. BPA will coordinate the four state-level assessments with HASC and will administer contracts with the participants.

The Indian cultural and archaeological values study will be performed by direct contract between the Council staff and an appropriately qualified contractor.

The anadromous fish assessment will be managed by the Council using an outside contractor. The coordinator will coordinate agreements, if possible, between the various agencies and tribes on technical matters (methods and techniques) and facilitate collection, either directly or by subcontract, of needed data. If BPA provides funds for this effort, it will retain its statutory responsibilities for contract administration in accordance with existing agreements between BPA and the Council.

The non-anadromous fish assessment will be conducted at the state level by a task force under the leadership of a study coordinator. A regional coordinator for this portion of the study will assist the state task force. The study is designed to produce consistent results by use of common evaluation criteria. The state task force will consist of state, federal and tribal authorities and will be comprised of technical experts with river resource expertise. The state task force should include cognizant state agencies, local jurisdictions to the extent it is possible and consistent with a local government jurisdiction over hydro within the state, National Marine Fisheries Service, U.S. Fish and Wildlife Service, Bureau of Land Management and the U.S. Forest Service.

Figure 1 shows the regionwide organization and Figure 2 shows the state organization. The roles and responsibilities of each group are defined below.

Figure 1:

ORGANIZATION CHART: REGIONAL LEVEL

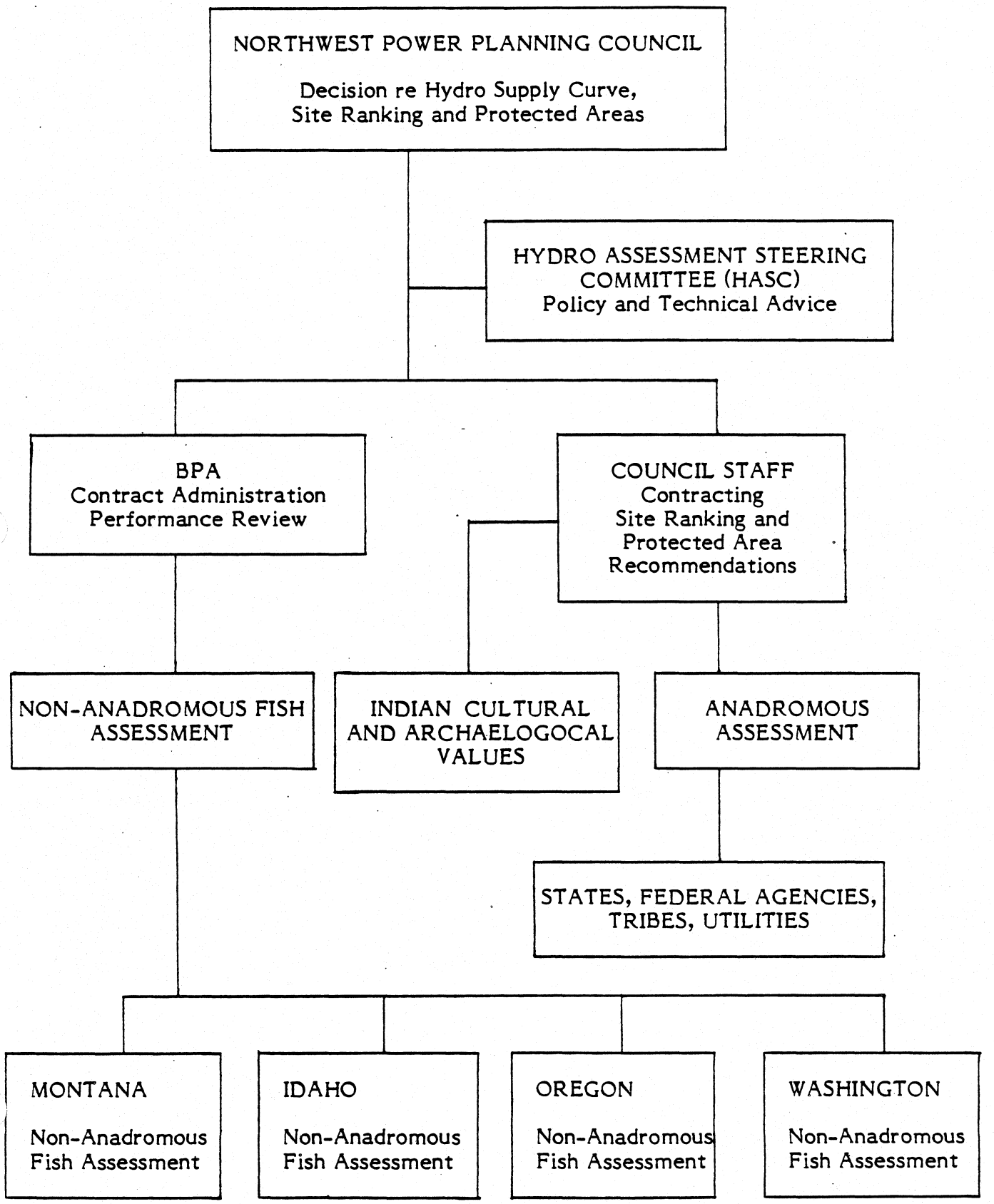
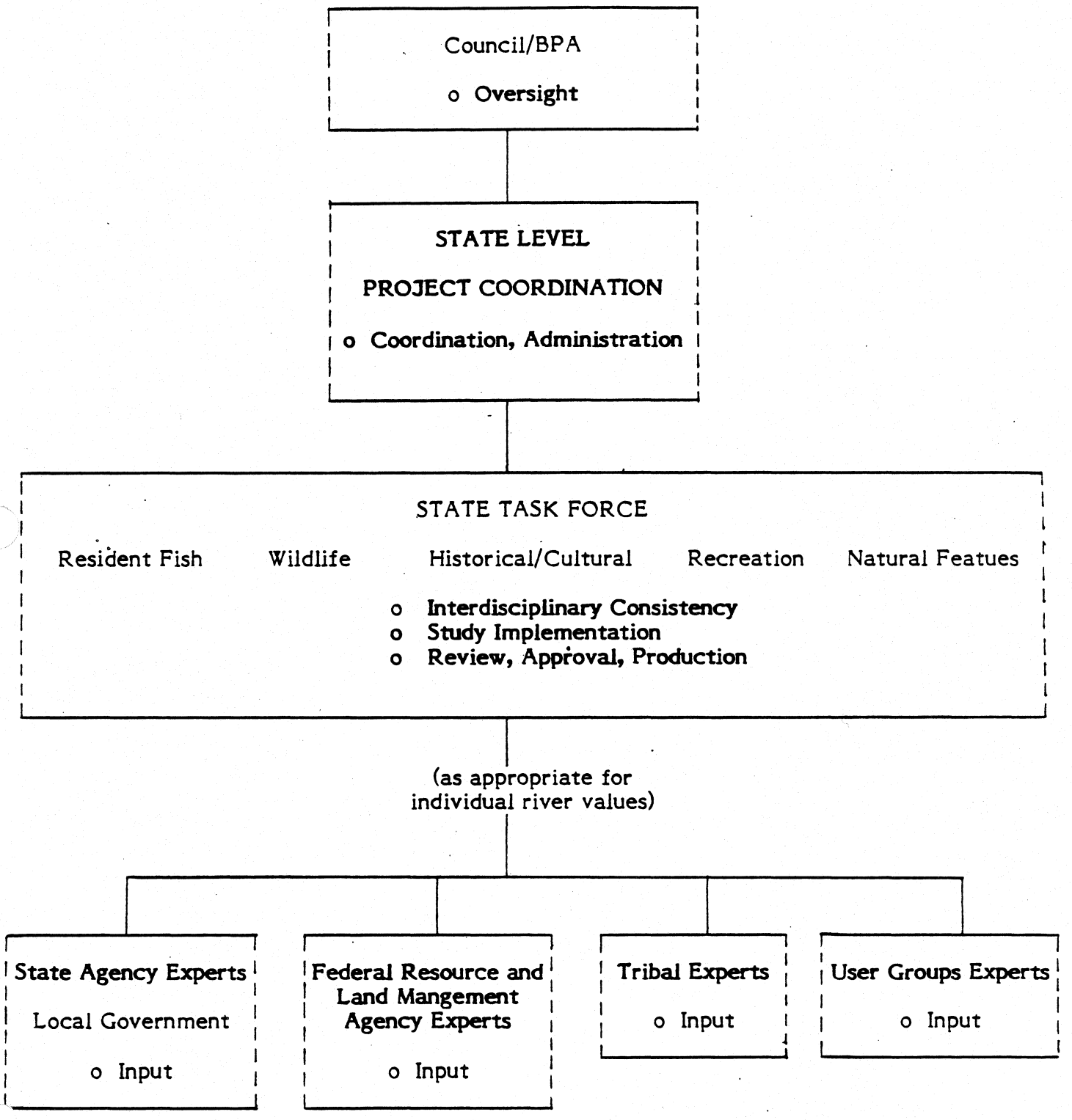


Figure 2

ORGANIZATION CHART: STATE LEVEL



State level study organization will be designated to meet individual circumstances.

1. Northwest Power Planning Council

   Determine final uses of study results.

2. Council staff

   a. Coordination of Hydropower Assessment Steering Committee activities.

   b. Manage anadromous fish assessment.

   c. Manage contract for Indian cultural and archaeological values.

   d. Propose and implement overall public information/involvement strategy.

   e. Recommend hydro supply curve, protected area and site ranking decisions to Council.

3. Hydropower Assessment Steering Committee (HASC)

   a. Recommend study direction, including recommendaton on study method and criteria.

   b. Review participant progress and products.

4. Bonneville Power Administration

   a. Administer contracts with state studies for non-anadromous fish assessment.

   b. Coordinate for HASC review consistent regionwide criteria for non-anadromous fish values.

   c. Develop data management system for all study products.

   d. Print all study documents and maps.

   e. Participate on HASC.

5. States (Oregon, Washington, Idaho and Montana)

   a. Perform non-anadromous fish assessment.

   b. Coordination of the study with HASC and BPA and federal resource/land management agencies, Indian tribes and local government.

   c. Participate on HASC.

   d. Participate in anadromous fish assessment.

6. Indian Tribes

   a. Perform assessment of Indian cultural and archaeological values.

   b. Participate in anadromous fish assessment.

   c. Participate in state non-anadromous fish assessment.

   d. Participate on HASC.

7. Federal Resource and Land Management Agencies (U.S. Fish and Wildlife, U.S. Forest Service, U.S. Bureau of Land Management, National Marine Fisheries Service, Corps of Engineers)

   a. Participate in anadromous fish assessment.

   b. Participate in state non-anadromous fish assessment.

   c. Participate on HASC.

8. Pacific Northwest Utilities Conference Committee/Resource Developers

   Participate on HASC.

VII. SCHEDULE

The schedule for the hydro assessment study is shown in Figure 3.

VIII. BUDGET

An estimated budget for the Hydro Assessment Study follows.

Figure 3

PACIFIC NORTHWEST RIVERS STUDY
SCHEDULE OF PRODUCTS

	TASK	RESPONSIBLE PARTIES	COMPLETION DATES
1.	Approve work plan	Council	August 29-30, 1984
2.	Identify rivers to be studied	Council Staff	September 30, 1984
3.	Designate state coordinators	State Governors	September 15, 1984
4.	Complete contracts	Council/BPA	September 30, 1984
5.	Select anadromous fish assessment coordinator	Council Staff	September 1984
6.	Convene state task force	State Coordinator	October 15, 1984
7.	Adopt criteria for river values	BPA/State Task Force	November 15, 1984
8.	Prepare evaluation format and base maps for state use	BPA	December 30, 1984
9.	Indian cultural and archaeologic assessment	Council/Tribes	November-April 1985
10.	Anadromous fish assessment	HASC/Coordinator/ Agencies/Tribes	October-June 1985
11.	Perform river resource assessments	State Task Force	January-October 1985
12.	Publish results	BPA	November 1985
13.	Computerize river assessment	BPA	November 1985
14.	Overlay hydropower sites	Council Staff	November 1985
15.	Recommend supply curves	Council Staff	
16.	Recommend protected area designations	Council Staff	
17.	Recommend site ranking	Council Staff	

Figure 4

BUDGET

CONTRACT	CONTRACTOR	SOURCE OF FUNDS	AMOUNT
Indian cultural and archaeological values	To be determined	Council	$ 40,000[1]
Anadromous fish assessment	To be determined. (Sub-contracts with appropriate entities as necessary to collect data)	Council, supplemented by BPA as needed	500,000
Non-anadromous fish assessment	States[2] (Oregon, Washington Idaho, and Montana)	BPA	700,000
	Tribes		130,000
	Federal agencies		130,000
			$1,500,000

[1]This figure is based on the estimated time of one individual to coordinate this effort among more than 40 tribes and prepare reports. It is recommended by the Chairman of HASC.

[2]Including local governments.

TAB 5

Bonneville Briefing Paper Outlining

Hydro Assessment Process (1987)

BRIEFING PAPER

PACIFIC NORTHWEST RIVERS STUDY: PRODUCTS AND USES

The Pacific Northwest Rivers Study began in 1984 as a cooperative effort by BPA, the Council, the four Northwest states, Indian tribes and federal land management agencies to inventory and assess under contract the significance of the region's rivers. (Attachment 1) Projected uses included the Council's Protected Areas Program, Subbasin Planning, and regional hydropower supply curves. The effort has resulted in both a data base and a network of over 2,000 regional experts which can be tapped for water resource information. The Office of Power Marketing (PM) can ensure the maintenance of the existing data sets and information networks for use in fish and wildlife endeavors. The continued promotion of a consistent regional data structure will prove invaluable to future BPA marketing programs, including fish and wildlife activities, transmission wheeling analyses, marketability determinations, environmental activities, etc. The three related data sets are described below.

1. Rivers Study participants identified seven categories of information as indicators of the environmental or ecological significance of rivers. Data collected to date include:

a) Anadromous Fish. This Council sponsored portion of the study collected presence/absence data on eight anadromous species. BPA propose to refine this data set by using the network established in the Rivers Study to verify the accuracy of data in the system, identify natural and man-made blockages, and to assess the significance of streams for the production of anadromous fish (as was done in the other resource categories.)

b) Resident Fish includes game and nongame species. Data was collected on habitat, species, and public use.

c) Wildlife refers to game and nongame birds and animals that inhabit river and stream corridors. Habitat types, species composition and public use data is available.

d) Natural Features refers to river-related endangered or threatened plants, unique plant communities, and geologic and hydrologic features. Data includes scarcity, scientific value, recreational use and vulnerability.

e) Cultural Features include archeological, architectural, and other historic sites located within river corridors. Criteria are those used for the National Register of Historic Places.

f) Recreation emphasized boating and active water activities. Data was collected primarily by direct input and review from user groups and federal land managers.

g) Institutional Constraints includes laws, policies, etc., that prohibit, limit, or otherwise impose conditions on river-related development. Federal, State, local and Tribal constraints are identified.

The data collected was structured into an assessment process resulting in a determination by the experts of the relative significance of each river segment for each resource category. This "final value" can be viewed as the tip of a data pyramid, with successive levels of more detailed supporting data underneath. The Rivers Study Program in PM will link more detailed data sets compiled by state, federal and Tribal experts to the bottom of the pyramid (e.g., creel census, redd counts, stream gradient, etc.). All data has been collected consistent with the regional data structure using the Environmental Protection Agency's (EPA) River Reach numbers (see GIS below). This system is currently used in all BPA and Council natural resource data sets including PJ's Project Management Information System . Regional organization of data for natural fish production and stream habitat condition will be used for planning and implementation of the Council's Fish and Wildlife Program.

2. The Pacific Northwest Hydropower Data Base and Analysis System includes detailed physical, hydrologic, and cost information on over 4,000 identified hydro sites in the region, as well as hydrology and cost estimating algorithms. A cooperative project with the Council and the Corps of Engineers, BPA currently compiles data using EDS contract staff, while the Corps maintains the computer data base for regional users (currently over 20 separate groups). BPA and the Corps have agreed in principle to enter into an MOU for long-term data base maintenance in 1987.

3. BPA's Division of Land Resources' Geographic Information System (GIS) displays and analyzes all data collected in the study by using a common river identifier - the EPA River Reach number. Currently available for all streams at 1:250,000 scale, the reach file and its associated graphics file (river traces) is being improved to the 1:100,000 scale this year by the U.S. Geological Survey (USGS) in cooperation with the EPA. When complete, this will enable BPA to display, map and analyze all river-related projects activities or studies. In FY 1988 the Environmental Coordinator's Office (PG) intends to enhance the system with lake and reservoir information to assist in intertie planning and system scheduling.

PRODUCTS

Each of the four states will complete in FY 1987 a set of publications documenting the study process (Assessment Guidelines), summarize major results (Final Reports), and assist data base users (Rivers Study Data Base User's Manuals). Each state has completed a state Rivers Study Data Base on personal computers which is being used for Protected Areas, supply curves, federal Wild and Scenic Rivers determinations, State Scenic Rivers Programs, and over 40 other uses. Representative GIS map products are also available for each state.

The USGS has completed the new 1:100,000-scale digital hydrography for the region and is linking these new river traces to updated EPA River Reach numbers. BPA is currently using the EPA's 1:250,000-scale data base. The National Park Service (NPS) is coordinating an analysis of the four State recreation data bases and attempting to ensure their longevity through a cooperative effort between state recreation agencies, the NPS (under authorities granted in the National Wild and Scenic Rivers Act) and recreation user groups. NPS (in cooperation with the Washington State Parks and Recreation Commission) will complete a riverside recreation survey, a flatwater boating survey, and a final report on Washington's outstanding rivers this fiscal year.

Drew Parkin coordinates the efforts of study participants to ensure compatible, consistent and useful products. Mr. Parkin will complete a regional summary report on the Rivers Study this fiscal year indicating accomplishments and suggesting possible refinements to the system, specifically in the fish and wildlife area. He will assist in the preparation of a four-color Backgrounder on the Rivers Study for public distribution (conceptual approval secured from Media Relations in May of 1987). In Fiscal Year 1988 Mr. Parkin will continue to coordinate systems development, specifically for graphic presentation and analysis of resource data, will frame the Lakes Study, and will help to apply of natural resource data sets to BPA needs.

TPansky/RMoulton:ld:3969 6/18/87 (WP-PRS-5040M)

ATTACHMENT I

CONTRACTS FOR NATURAL RESOURCE
DATA BASES

I. CONTRACTS IN PLACE - FY 87

Contractor	Amount	Purpose	Sponsoring BPA units
Rivers Study			
Oregon-ODOE	55,500	Complete Final Reports; Maintain data base; provide data updates to BPA.	PR, PJ
Washington-WSEO	50,625	Complete Final Reports; Maintain data base; provide data updates to BPA.	PR, PJ
Idaho-IDFG	34,600	Complete Final Reports; Maintain data base; provide data updates to BPA.	PR, PJ
Montana-DFWP	59,258	Complete Final Reports; Maintain data base; provide data updates to BPA.	PR, PJ
Oliver Walker	17,073	Prepare data base menus for supply curves, test algorithm and training.	PR
Drew Parkin	63,072	Complete Rivers Study Final Report; develop data management system; coordinate project participants; develop regional data analysis techniques.	PR
National Park Service; Pacific Northwest Region	28,800	Coordinate & assist in historical, recreational, and cultural evaluations of NW rivers.	PR
Hydropower Site Data Base			
EDS	93,000	Process hydrosite information obtained from Corps of Engineers and FERC cooperatively with the Corps.	PR, SW
Ott Water Engineers	16,581	Complete training of EDS staff; prepare data base users manual; complete supply curve algorithm.	PR
Geographic Information Systems			
U.S. Geological Survey	137,720	Complete 1:100,000-scale digital hydrography for Pacific N.W.	EVRE, PR

Idaho-IDFG	83,300	Refine data management system; provide .5 FTE; acquire essential software; develop data linkages to BPA/Council; provide data periodically.	PR, EVRE
Washington-WSEO	64,050	Refine data management system; provide .5 FTE; acquire essential software; develop data linkages to BPA/Council; provide data periodically.	PR, EVRE
Oregon-ODOE	31,113	Refine data management system; provide .5 FTE; acquire essential software; develop data linkages to BPA/Council; provide data periodically.	PR, EVRE
Montana-DFWP	39,270	Refine data management system; provide .5 FTE; acquire essential software; develop data linkages to BPA/Council; provide data periodically.	PR, EVRE
Info Tec Data Products	23,363	Develop menus for BPA GIS applications; prepare documentation and provide advice.	PGC, PR

II. CONTRACTS PROPOSED - FY 1988

Contractor	Amount	Purpose	Beneficiary
Rivers Study			
Oregon-ODOE	30,000	Coordinate input within states, including federal & Tribal; maintain data base; provide data updates primarily F&W; develop standardize F&WL data structure; develop lakes study plan; disseminate data; employ .25 FTE.	PJ, PR
Washington-WSEO	30,000	Coordinate input within states, including federal & Tribal; maintain data base; provide data updates primarily F&W; develop standardize F&WL data structure; develop lakes study plan; disseminate data; employ .25 FTE.	PJ, PR

Idaho-IDFG	30,000	Coordinate input within states, including federal & Tribal; maintain data base; provide data updates primarily F&W; develop standardize F&WL data structure; develop lakes study plan; disseminate data; employ .25 FTE.	PJ, PR
Montana-DFWP	30,000	Coordinate input within states, including federal & Tribal; maintain data base; provide data updates primarily F&W; develop standardize F&WL data structure; develop lakes study plan; disseminate data; employ .25 FTE.	PJ, PR
OR, WA, ID	75,000	Anadromous Fish Assessment Study for each state in Study format.	PJ, PG, PR

Hydropower Site Data Base

EDS	Funded in Fy 87; 20,000 to be expended in FY 88	Process Site information until Corps assumes function.	PR

Geographic Information Systems

Oregon-ODOE	30,000	Refine River Reach files; integrate anadromous fish data to data base; standardize Fish and Wildlife info.; provide .25 FTE; provide Protected Areas data to BPA/Council.	PJ
Washington-WSEO	30,000	Refine River Reach files; integrate anadromous fish data to data base; standardize Fish and Wildlife info.; provide .25 FTE; provide Protected Areas data to BPA/Council.	PJ
Idaho-IDFG	30,000	Refine River Reach files; integrate anadromous fish data to data base; standardize Fish and Wildlife info.; provide .25 FTE; provide Protected Areas data to BPA/Council.	PJ

Montana-DFWP	30,000	Refine River Reach files; integrate anadromous fish data to data base; standardize Fish and Wildlife info.; provide .25 FTE; provide Protected Areas data to BPA/Council.	PJ
Drew Parkin	60,000	Coordinate data preparation for Protected Areas evaluation; coordinate state data systems development, data consistency and analytic techniques.	PJ
U.S. Geological Survey	50,000	Prepare River Reach books; improve regional reach data base.	PJ, EVRE
Tribes	60,000	Develop data links to Council and BPA resource data bases.	PJ, PG, PR, EVRE

III. OUT YEAR CONTRACTS - FY 89-91

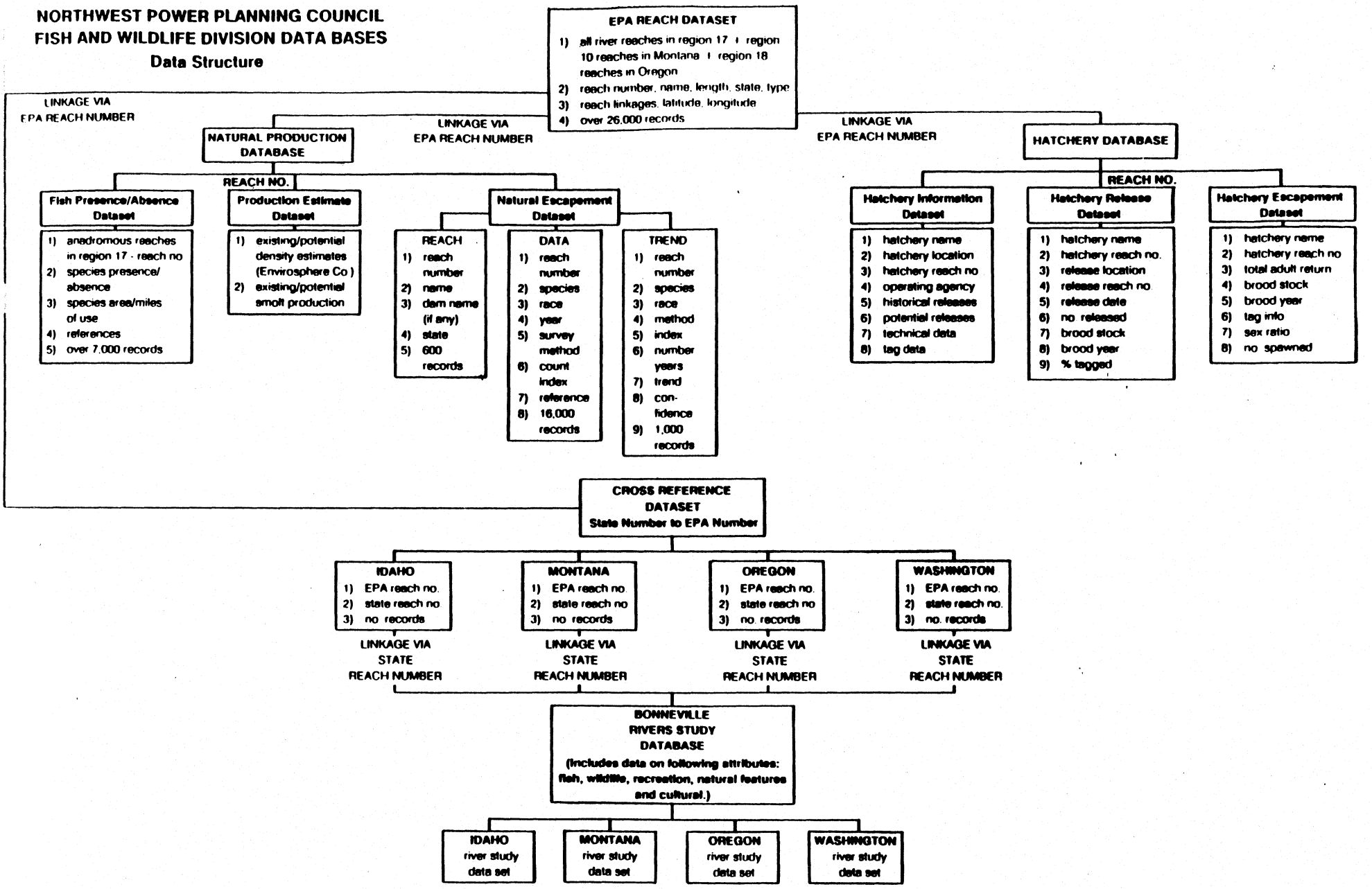
States (4)	$30-50,000 per state per year for data base maintenance (.5 FTE) and data updates for systems planning (Council), anadromous fish goals, natural resources data bases.
Corps MOU Funding	$25-40,000 per year for Hydro site data base
Tribes	$10-20,000 per year for data base maintenance
U.S. Geological Survey	$25,000 per year for GIS data base additions (e.g., contours, wetlands, surface water modeling, etc.)

RMoulton:ld:3973 6/18/87 (WP-PRS-5043M)

TAB 6

Hydro Assessment Data Base

NORTHWEST POWER PLANNING COUNCIL
FISH AND WILDLIFE DIVISION DATA BASES
Data Structure



Attachment 1.

March 20, 1986

FISH AND WILDLIFE DATA BASE DEVELOPMENT

A. Content. There are several data files resident on the Council's VAX780 that presently comprise the Fish and Wildlife data base.

1. EPA River Reach (23,468 records). This data file is the master EPA river reach file for all river reaches present on the EPA file for Oregon, Washington, Idaho, and Montana. Currently it is being updated to include additional reaches for which we have data that were not included in the original system. A partial listing of attributes includes stream name, EPA number, upstream and downstream linkages, latitude/longitude locaters, and stream mileages.

2. Escapement (15,000 records). This data file was obtained via an intergovernmental agreement with the U. S. Fish and Wildlife Service's National Fishery Research Center in Seattle. At present, this file contains data primarily from the Puget Sound region but ultimately will include data from the entire Columbia River Basin when data collected this year is entered.

3. Area (8,693 records).

A. In Basin - this data set contains 3,958 records: 3,365 from the original EPA file and 593 added by the Council. This data set is now complete for areas in the Columbia River Basin below blockages and includes reach-by-reach data on salmon and steelhead distribution and habitat area estimates.

B. Out Basin - This data set contains 4,735 records: 2,534 from the EPA file and 2,201 added. This data set includes reach-by-reach distribution data for salmon and steelhead plus habitat area estimates for coastal Oregon, coastal Washington, and Puget Sound. The Oregon portion is complete with entry for Washington nearing completion.

4. State River Reach (17,143 records to date). This data file consists of one data set for each state containing the stream reaches presently numbered by that state with its unique stream reach numbering code.

A. Oregon - 14,100 records (DWR codes)

B. Washington - 1,414 records (WRIA codes)

C. Idaho - 1,629 records (IDFG codes)

D. Montana - codes not yet received

5. Cross-Reference (16,175 records). This is a work file linking each stream reach's EPA code number with its state code number. The cross-reference is 90% complete in Oregon, 95% complete in Idaho, 50% complete in Washington, and has not yet begun for Montana.

A. Oregon - 4,044 records

B. Washington - 2,683 records

C. Idaho - 4,184 records

D. Montana - 5,264 records

6. Rivers Study. This data file will include data collected by BPA on Rivers Study (nonanadromous) values. The Oregon data set is being entered by the Council under a BPA purchase order. The remaining data will be entered by each state and transferred to the Council upon completion.

A. Oregon - The fish and wildlife data entry is approximately 80% complete. The historical features data set has been received and loaded onto the Council's computer.

B. Washington - No data has been received from Washington.

C. Idaho - The fisheries data set has been received and loaded onto the VAX. Wildlife and other categories are arriving soon.

D. Montana - The natural features data set has been received and loaded.

7. Dam Count (45,000 records). This data file includes daily dam counts by species for all the mainstem Corps dams from 1961 through 1985. The contents of this file will be merged into the Escapement data set.

8. Density Estimates (3,867 records). This data file is a product of the productivity analysis contract and includes existing and potential density factors and smolt estimates for 3,867 stream reaches in the Columbia River Basin.

9. ANADFISH. This data file will merge the Escapement data file, the Area data file, and other data collected from agency and tribal sources. Additional data entry will include catch, hatchery, habitat, productivity, and other attributes.

B. Schedule. The development status of each data file for the next six months is projected to be:

June 1, 1986:

1. EPA River Reach - Update continues for the addition and linkage of new reaches.

2. Escapement - Additional data entry for basin and merging with the dam count data set.

3. Area - Data entry complete for areas below barriers; refinement of width data, addition of specific habitat use (spawning vs. rearing, etc.), and the inclusion of data for areas above barriers dependent upon resources and help available.

4. State River Reach - Complete.

5. Cross-Reference - Oregon, Idaho, and Washington will be complete with work beginning on Montana.

6. Rivers Study - Data collection and compilation should be complete with major emphasis on data preparation for BPA and data outputs for interested parties.

7. ANADFISH - Data entry for data collected from agencies and tribes continuing; emphasis on escapement and hatchery data.

August 1, 1986:

1. EPA River Reach - Minor corrections and updates.

2. Escapement - Data entry continuing.

3. Area - Unchanged from June 1.

4. State River Reach - Complete.

5. Cross-Reference - Complete for all four states.

6. Rivers Study - Continued data preparation and output.

7. ANADFISH - Data entry continuing with hatchery and escapement entry nearing completion.

October 1, 1986:

1. EPA River Reach - Updates completed.

2. Escapement - Data entry complete for information collected in 1985.

3. Area - Unchanged.

4. State River Reach - Complete.

5. Cross-Reference - Complete.

6. Rivers Study - Complete.

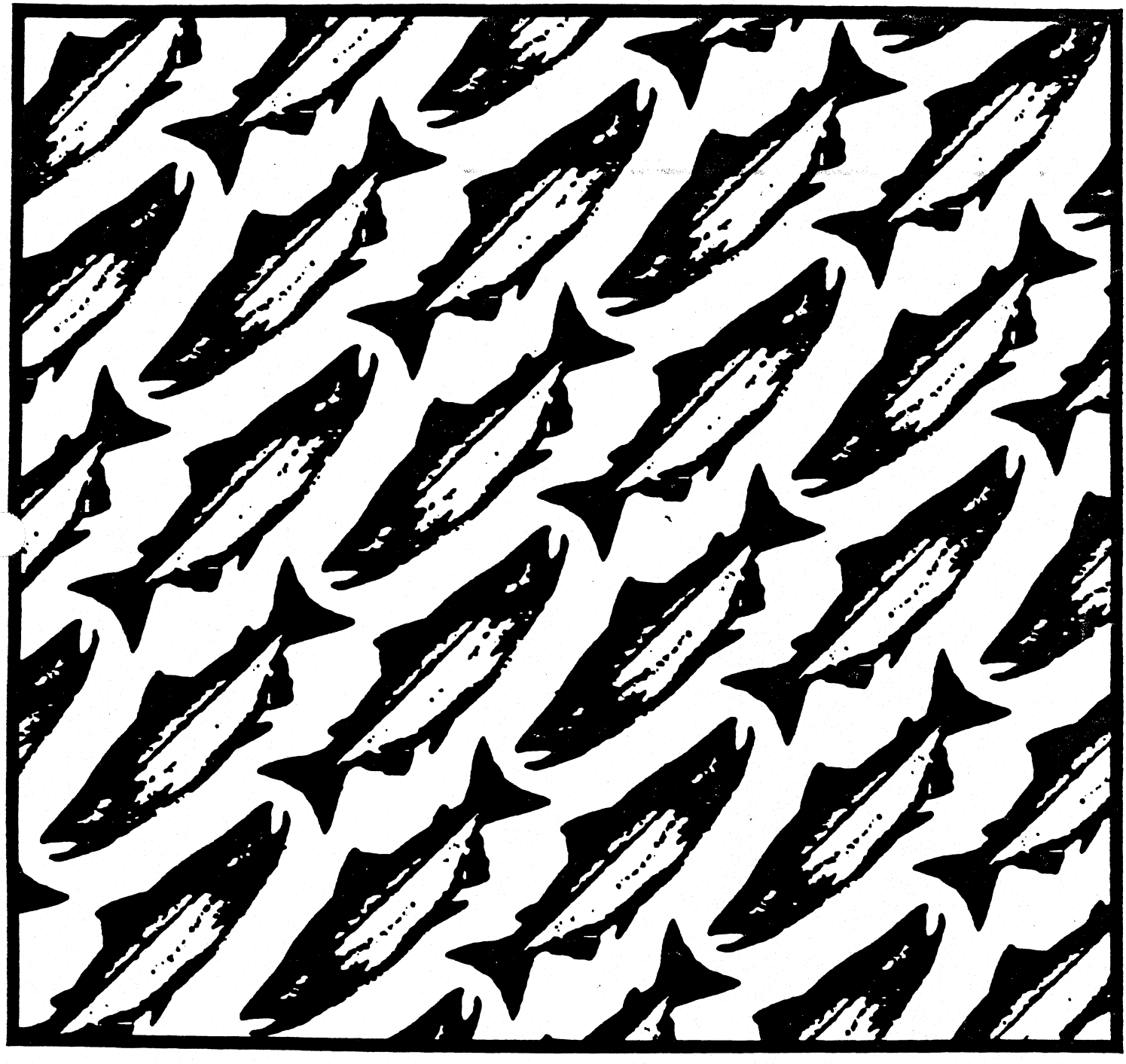
7. ANADFISH - Data entry for information collected in 1985 essentially complete.

TAB 7

1987 Issue Paper

Staff Issue Paper

PROTECTED AREAS DESIGNATION



October 8, 1987

NORTHWEST POWER PLANNING COUNCIL

ISSUE PAPER

PROTECTED AREAS DESIGNATION

The purpose of this issue paper is to describe the results of a three-year Hydro Assessment Study and to propose a course of action which, if approved by the Council, would lead to rulemaking on the subject of protected areas. If protected areas are included in the Fish and Wildlife Program and the Power Plan through amendment proceedings, they would provide the following benefits:

1. They would help ensure that substantial ratepayer investments in fish and wildlife rehabilitation in the Columbia River Basin would not be undermined.

2. They would provide clearer signals to potential developers on the importance of fish and wildlife resources in given portions of the Basin and the region and would help developers focus their attention on less sensitive areas for development.

3. They would provide useful information to the Federal Energy Regulatory Commission so that its hydropower decisions can reflect the region's interest in quality resource development and environmental protection.

In deciding whether to enter rulemaking, it is important to consider the background of the Hydro Assessment Study, and the legal, biological and institutional reasons that led to the initiation of these studies. These topics are discussed in detail in the body of this document.

Based on the results of the Hydro Assessment Study and recommendations from the four Northwest States, the staff recommendation proposes the following guidelines for protected areas:

1. Protect all areas currently used by anadromous (ocean-migrating) fish or potentially usable by anadromous fish in the Columbia River Basin.

2. Protect all areas currently used by anadromous fish outside the Columbia River Basin.

3. Protect high quality resident fish and wildlife areas both inside and outside the Columbia River Basin.

4. Provide for reevaluation of protected areas after system planning is completed. (The Council is about to embark on an analysis of 31 subbasins in the Columbia River Basin to determine their potential contributions to the goal of doubling salmon and steelhead runs. When these subbasin plans are completed, they will be integrated into a single basinwide or "system" plan.)

The Council would like comments on the following issues raised in this paper:

1. Should the Council enter rulemaking for purposes of designating protected areas?

2. Should protected areas be designated both in and out of the Columbia River Basin?

3. Should protected areas be expanded to include specifically non-fish and wildlife values?

4. Are there other considerations which should be taken into account by the Council?

The Council is also seeking comment on the accuracy of its data base. To help commentors, either hard copy or computer diskette copies of the data will be made available upon request.

The schedule for presentation and comment on the issue paper is as follows:

October 15	Staff presentation of issue paper to the Council in Helena
November 12-13	Public comment on issue paper at the Council meeting in Tacoma
December 9-10	Public comment on issue paper at the Council meeting in Portland
January 8, 1988	Deadline for written comments
February 1988	Council action

Consultations will be scheduled with interested parties during October, November and December.

For further information, copies of reports or data contact Ms. Janie Pearcy, Northwest Power Planning Council, 850 S.W. Broadway, Suite 1100, Portland, Oregon 97205, 503-222-5161; 1-800-452-2324 (Oregon toll-free number); or 1-800-222-3355 (regional toll-free number).

I. INTRODUCTION AND BACKGROUND.

A. Protected Areas and Site Ranking.

The fish and wildlife resources of the Columbia River Basin have been adversely affected by past hydroelectric development, and it is possible they could be harmed even more by future development. The Council estimates that approximately 35% of anadromous fish habitat has been lost, due in part to hydroelectric development. (See program section 203(b)(1).) Yet more hydropower development will occur. The Corps of Engineers and the Bureau of Reclamation continue to study the need for additional federal hydroelectric projects and to plan for new development. The records of the Federal Energy Regulatory Commission (FERC), which licenses nonfederal hydroelectric development, suggests that most new hydroelectric development in the Columbia River Basin and in the Pacific Northwest will be accomplished by private or nonfederal public entities. FERC has at least 350[1] applications pending for hydroelectric development in Idaho, Oregon, Montana and Washington. Many of those applications and permits are for projects within the Columbia River Basin. A number of these are proposed for tributary drainage basins which contain important anadromous fish habitat, such as the Salmon River Basin in Idaho.

In 1981, the region's fish and wildlife agencies and Indian tribes called for the Council to influence federal development and licensing of new hydroelectric development in the Columbia River Basin. They proposed procedural and substantive standards to ensure that no new hydroelectric development took place without considering cumulative effects and adequate mitigation of any adverse effects on fish and wildlife. A significant number of recommendations also requested that certain unaltered streams and priority wildlife habitats be protected from all future hydroelectric development as mitigation for the extensive fish and wildlife losses caused by hydroelectric development in the past.

In 1982, when the Council adopted its first fish and wildlife program, the Council agreed with the concept of protecting some streams and wildlife habitats from future hydroelectric development. The Council initiated studies to ensure that recommendations for protective classification would have the benefit of a standard set of criteria and that the criteria would apply systemwide. The program

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1 This figure includes pending preliminary permits, granted preliminary permits, pending licenses and pending exemptions. It does not include projects that have been granted licenses or exemptions.

called on Bonneville to conduct an 18-month study of alternatives for designating certain streams and wildlife habitat in the Columbia River Basin to be protected from future hydroelectric development. The Council said that, based on the results of that study and the requirements of the Northwest Power Act, it would designate stream reaches and wildlife habitat areas to be protected from further hydroelectric development.

In developing the Northwest Conservation and Electric Power Plan in 1983, the Council also recognized the need to have a more reliable estimate of the amount of developable hydropower in the region. Accordingly, the Council called for a regionwide study to rank potential hydropower sites based on fish and wildlife concerns. In doing so, the Council stated that the site-ranking study should be coordinated with the protected areas study under the Council's Fish and Wildlife Program. The site-ranking process was to result in three categories of sites:[2] 1) those with insignificant adverse impacts on fish and wildlife, 2) those where adverse impacts could be mitigated, and 3) those where adverse impacts could not be mitigated. In addition, the Council said that it would continue its effort to refine the Corps' of Engineers data base on existing and potential hydropower sites that are environmentally sound and cost-effective. These site ranking provisions are not mentioned specifically in the 1986 power plan, but the plan commits the Council to reevaluate the region's hydropower potential.

In August 1984, the Council formally initiated the studies called for in the program and the plan by adopting the Pacific Northwest Hydro Assessment Study Work Plan.

B. The Pacific Northwest Hydro Assessment Study

Because the protected areas and site ranking studies are closely related, the Council established the Hydropower Assessment Steering Committee (HASC)[3] in October 1983 to help coordinate these actions.

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2 The 1983 Power Plan stated that the term "sites" was to be used in a broad sense and was meant to cover both specific sites and stream reaches.

3 The Hydropower Assessment Steering Committee was composed of members representing state and federal fish and wildlife agencies, energy agencies, Bonneville, the Corps, federal land management agencies, the Bureau of Reclamation, small hydro developers and the Pacific Northwest Utilities Conference Committee. The committee provided advice to the Council but did not function as a voting body. Individual members may disagree with the recommendations and conclusions of this document.

On August 29, 1984 the Council adopted the Pacific Northwest Hydro Assessment Study Work Plan, which was based on the work of the Council's HASC. The Hydro Assessment Study Work Plan was aimed at providing information to help the Council to designate protected areas and rank sites. The Hydro Assessment Study was divided into three major components: the anadromous fish study, the rivers assessment study, and the hydro site data base.[4]

1. Anadromous Fish Productivity Study.

For anadromous fish, the Council has characterized stream reaches throughout the region based on whether they contain anadromous fish, their importance as migratory routes and their potential habitat value. The data for this characterization were provided by the fish and wildlife and land management agencies, tribes, and utilities.

2. The Rivers Assessment Study.

For nonanadromous fish values (resident fish and wildlife and cultural, aesthetic or other river values), a Pacific Northwest River Assessment Study was coordinated and funded by the Bonneville Power Administration. This study was conducted with the participation of states, federal agencies, and tribes. The study identified the significance of each stream based on an assessment of "river values:" special protections, such as wild and scenic rivers status, resident fish use, wildlife use, recreational use; cultural values, such as historical or archaeological significance; and natural features.[5]

3. The Hydro Site Data Base.

In the past the Council has received estimates of environmentally-acceptable hydropower ranging from 400 to 4,000 megawatts. These estimates were based on inadequate resource information. In an effort to refine further its data base on environmentally sound and cost-effective hydropower sites, the Council determined that the data base should include constraints beyond fish and wildlife values. These

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4 All the information generated is computerized and can be cross-referenced through the use of a river reach coding system common to all three data bases.

5 This information has been combined with a data base being developed by the Corps of Engineers and Bonneville to help the Council staff to make recommendations on protected areas and site ranking. The hydro site data base contains site-specific information on costs, capacity, output, location, and other characteristics of existing and proposed hydroelectric projects in the Pacific Northwest.

could reduce the amount of dependable hydropower in the Council's resource estimates.

The Council is attempting to obtain a realistic estimate of hydropower capability in the region by: 1) identifying the electrical capability of all projected hydropower projects in the Northwest; 2) reducing the estimate in accordance with the Council's designation of protected areas and site ranking; and 3) reducing the estimate further based on the river values assigned in the River Assessment Study.

All data have been collected for both the Anadromous Fish Productivity and Rivers Assessment studies. The anadromous fish data base has been reviewed by the fish, wildlife, and land management agencies, tribes, and the general public. The rivers assessment data have been reviewed at the state level by the agencies and tribes and has been subjected to public scrutiny through a series of public meetings conducted in each state. The Hydro Assessment Study Work Plan contemplated that the states would submit to the Council proposals for protected areas based on the data collected in the three studies. The states (Idaho, Montana, Oregon and Washington) now have done so. The state proposals contain the results of the studies described above, and their criteria and recommendations for protected areas.

In the course of the Hydro Assessment studies, it became apparent that the distinction between "protected areas" and site ranking" was confusing and, accordingly, the site ranking terminology was dropped. The staff's proposal is to designate protected areas throughout the region, while recognizing that such designations have different legal consequences within the Columbia River Basin than in the region outside the Basin. (See Attachment 1)

C. LEGAL CONSIDERATIONS

Attachment 1 discusses the Council's legal authority to designate protected areas in the region and in the Columbia River Basin. The attachment also discusses the legal significance of protected area designation.

Briefly, the Council may designate protected areas after considering fish and wildlife, environmental, and power system impacts. Such designations would not be enforced directly by the Council but would be implemented by various federal agencies in accordance with their obligations under the Northwest Power Act and other laws.

D. BIOLOGICAL AND INSTITUTIONAL CONTEXT

In choosing to pursue the Hydro Assessment Study, the Council recognized the historical losses to fish and wildlife, particularly salmon and steelhead, due to the construction and operation of the

existing hydroelectric system. This recognition of the losses to fish and wildlife was consistent with the the views of Congress in passing the Northwest Power Act. However, at the time the Council adopted the Hydro Assessment Study Plan, no estimate had been made of the extent of the losses due to the hydrosystem. As part of the basis for establishing a goal for the Fish and Wildlife Program, the Council initiated a study to determine the extent of the hydro-related losses. As a result of that study, the Council concluded in its 1987 Columbia River Basin Fish and Wildlife Program that the estimated decline in run size due to hydropower development and operation ranges from 5 million to 11 million adult salmon and steelhead. This compares with a total decline from all causes of about 7 million to 14 million adult fish. In contrast, the average annual run size is presently about 2.5 million adult fish. In addition, the Council concluded that salmon and steelhead habitat in the entire Columbia River Basin has decreased from about 14,700 river miles before 1850 to about 10,100 river miles in 1976, a loss of about 30 percent.

In light of the losses to salmon and steelhead in the Columbia River Basin and the contribution of the hydropower system to those losses, the Council has set doubling the runs as an interim goal. Doubling means increasing the current run size of about 2.5 million adult fish to one of about 5 million adult fish. Achieving this goal will require a mix of wild, natural and hatchery production. Protecting valuable fish habitat from hydropower development should preserve an appropriate environment for wild and naturally spawning fish. Accordingly, protected area designations could play an important part in the Council's basinwide strategy to double existing anadromous fish runs.

The Northwest Power Act directed that "the program, to the greatest extent possible, shall be designed to deal with that river and its tributaries as a system." 16 U.S.C. 839b(h)(1)(A). The Council has determined that development of new hydro facilities within the basin must be consistent with this systemwide approach and with the system planning process being initiated under section 200 of the program. The system planning process will develop a plan for doubling existing anadromous fish runs within the framework of a number of policies. See program section 204. In the system planning process, the 31 subbasins comprising the Columbia River Basin will be intensively studied to identify methods for increasing production in each of the subbasins. The subbasin measures will be integrated into a system plan, in which production, harvest, mainstem passage, and system policies are balanced. The Council expects that the system planning process will be completed in approximately two and one-half years.

Two of the Council's system policies are particularly relevant to the protected areas process. First, the Council believes that increased production must come from a variety of production methods,

including wild and natural production. See program section 204(d). In order to ensure that wild and natural production options are fully available for increased production, valuable habitat should be protected. Without such protection, efforts to rebuild fish runs may be forced away from wild and natural production, closing options that could help rebuild self-sustaining runs. Second, the Council believes that genetic risks in enhancing production must be assessed so a high degree of genetic diversity may be maintained. See program section 204(b). Maintaining habitat for wild and naturally spawning fish will help the Basin to maintain genetic diversity.

II. THE STAFF PROPOSAL

As stated in the background section, the original intent of the Hydro Assessment Study was to provide a uniform method to collect data and establish criteria to designate protected areas, carry out site ranking and provide a better estimate of the available environmentally acceptable hydropower in the region. To a great degree, these goals were accomplished. However, during the course of the study it became clear that the site categorization envisioned as part of the site ranking process needed to be modified.

The major problem was the development of the list of Category II sites (sites that posed threats to fish and wildlife but where those threats could be mitigated). Because the study looked at fish and wildlife values on a river reach basis and not on a project basis, it was impossible to evaluate mitigation techniques on a project-specific basis. To do so would have required detailed engineering plans for all projects in the region. Because this type of information was unavailable for the vast majority of projects proposed for the region, no attempt was made to evaluate individual projects. Instead, the study was done on a site-blind basis in which river reaches were evaluated solely on their value as fish and wildlife habitat. It was only after the fish and wildlife values were identified that the hydro sites were linked to the corresponding river reaches.

Because of this study limitation, the staff is proposing the use of only two categories of sites: 1) sites which fall into high value fish and wildlife areas and therefore should be designated as unsuitable for development and 2) sites which do not fall into the high resource value areas and therefore are potentially developable. Given that these designations would be made using the same criteria as are used within the Columbia River Basin, the first category of sites would be equivalent to protected areas within the Basin, but with different legal implications (see Attachment 1).

Based on the foregoing and the recommendations received from the states the Council staff recommends that the Council enter rulemaking

to amend the program and the plan to designate protected areas according to the following guidelines:

1. Designate for protection all areas currently used by anadromous fish or potentially usable by anadromous fish in the Columbia River Basin.

In choosing to undertake system planning, the Council recognized that doubling salmon and steelhead runs may be very difficult but appear to be possible. In order to succeed, the Council cannot afford to foreclose any opportunity to maintain or increase the existing run size. The development of hydropower projects in areas currently supporting anadromous fish, or in areas that have reasonable potential for supporting anadromous fish in the future, could undermine the Council's and regional ratepayers' efforts to double the runs.

The proposal to designate anadromous fish habitat inside the Columbia River Basin is intended to protect all currently available anadromous fish habitat as well as habitat that is potentially available for anadromous fish use. The potentially available habitat has been identified as habitat that historically contained anadromous fish and could be used by these fish in the future. Also included as potentially available habitat were areas identified in the Fish and Wildlife Program as habitat restoration sites. Areas above impassable migratory barriers were excluded from the analysis, as were areas within federally designated wilderness areas. If this proposed guideline were adopted, approximately 25 percent of the total river miles within the basin would be designated as protected areas. Based on the number of projects analyzed the amount of energy affected is estimated at 140 average megawatts (See Attachment 2).

2. Designate for protection all areas currently used by anadromous fish outside the Columbia River Basin.

As explained above, designating anadromous fish areas outside the Columbia River Basin derives from the site-ranking process described in the 1983 Power Plan. The proposal to designate river reaches containing anadromous fish as unsuitable for development is analogous to what were termed Category III sites in the Power Plan (e.g. river reaches which would cause unmitigatable damage to fish and wildlife resources).

The staff recommendation is consistent with the recommendations of the states of Oregon and Washington fish and wildlife agencies, the two states where anadromous fish occur outside of the Columbia River

Basin.[6] In Oregon's case the recommendation is also consistent with state law, which prohibits the development of hydroelectric projects in areas containing anadromous fish. (See ORS 469.371(1)(a), 537.017(1)(a), and 468.734(1)(b)(C).) In the case of the other states, the staff proposal is consistent with the recommendations of the relevant state fish and wildlife agencies.

The major difference between the staff-recommended approach for areas inside the Columbia River Basin and those outside the basin is that there would be no protection for potential anadromous fish habitat outside the basin. The reason for this difference is that outside of the basin, the Council has no program to enhance existing fish runs. Nonetheless, the Council recognizes the importance of maintaining existing runs outside the basin. Additionally, it should be noted that declines in runs of salmon and steelhead outside of the basin could lead to increased harvest pressures on Columbia River Stocks.

If implemented, this guideline would cover approximately 27 percent of the total river miles outside of the basin. The amount of energy affected is estimated to be 306 average megawatts (See Attachment 2).

3. Designate high quality resident fish and wildlife areas both inside and outside the Columbia River Basin.

Both the Power Plan and the Fish and Wildlife Program determined that site ranking and protected areas designations should reflect all fish and wildlife values, not just anadromous fish values.

The staff proposes that the Council designate those river reaches that have been identified by the states as containing species of special concern (e.g. rare, threatened, or endangered species, or species with high recreational value) or habitats necessary to support such species. The proposal is based on the recommendations of the states. It should be noted that under their recommendation only a small subset of the river reaches that were designated as class I sites in the Hydro Assessment Study (the highest ranked sites in terms of their fish and wildlife values) are proposed for protected designation. If the Council chose to adopt this proposal, an additional 17 percent of the river miles within the Columbia River Basin and 3 percent of the miles outside the basin would be classified as protected.

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6 The Washington Department of Energy office recommended that the Council delay designating protected areas outside the Columbia River Basin until the state completes its internal evaluation of those areas.

The equivalent energy figures are estimated at 308 and 60 average megawatts, respectively (See Attachment 2).

4. Provide for reevaluation of protected areas after system planning is completed.

As stated above, one reason for designating protected areas is to ensure that options for increased production are not foreclosed. Once the previously discussed system planning process is completed, however, it likely will be necessary to reevaluate protected areas within the Columbia River Basin. In order to facilitate this effort, data being collected through the system planning process will be cross referenced to the fish and wildlife data base developed during the hydro assessment process.

III. Analysis

1. Hydropower Impacts.

The Council directed that the Hydro Assessment Study should, examine the impacts of the protected areas proposals on hydroelectric power potential. In carrying out this instruction, the staff examined the impacts of the proposals on projects for which an application for a preliminary permit, license or exemption is pending. The results of the analysis are shown in Attachment 2. A total of 387 active projects was analyzed: 193 of the projects are within the Columbia River Basin, 194 outside. If the Council followed the staff proposal, 241 of the projects (62%) would be affected by a protected area designation. Of the 241 affected projects, 123 are within the basin and 118 outside. Within the basin this would represent 60 megawatts of capacity or 448 average megawatts of energy. Outside of the basin the equivalent figures are 682 megawatts and 366 average megawatts of energy.

On the other hand, the staff proposal would leave 146 projects (38%) unaffected by protected area designations. These projects represent 1780 megawatts of capacity or 917 average megawatts of energy. Of the total 1780 megawatts, 1546 megawatts (representing 795 average megawatts) are within the Columbia River Basin, and 234 megawatts (representing 122 average megawatts) are outside the basin.

2. Benefits of staff proposal.

- o Preserves production options needed to achieve interim doubling goal. The Council has recognized that doubling the runs will require a mix of production methods, including wild and natural production. Preserving habitat for wild and

natural production will help preserve the Council's options in reaching the doubling goal.

- o Respects the Council's interest in conserving genetic resources. The Council's policy of evaluating carefully the genetic consequences of its actions will require the development of new methods of genetic risk assessment. Pending development of new methods, designating protected areas tends to conserve genetic resources until trade-offs are identified in system planning and choices are made.

- o Is compatible with the existing power system. Designating protected areas throughout the region should encourage geographically-balanced hydropower development, and minimize potential incompatibilities. Moreover, if the Council limits its decision on protected areas to within the Columbia Basin it will likely serve to shift most new development to areas outside of the Basin. This shift could cause a decline in the fish and wildlife resources which could result in increased harvest pressure on Columbia River resources.

- o Allows ample room for future hydropower development. Approximately 917 average megawatts of proposed new energy would not be affected if the staff proposal were adopted. This is equivalent to the 920 megawatts of new hydroelectric capacity the Council identified in its 1983 Power Plan.[7] However, it should be noted that all of the potential hydropower may not be cost-effective, and therefore, the 917 average megawatts represents an upper limit for new development.

Moreover, the information provided by the designation of protected areas would assist hydropower developers in focusing on areas of least environmental concern and resource conflict. The proposal should enable the region to preserve its adequate, reliable and economical power supply.

3. Disadvantages of Staff Proposal

The major disadvantage to the staff proposal is that it could affect several potential hydro projects where developers have already invested sums of money. If the Council follows the staff proposal these investments may be adversely impacted.

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7 In its 1986 Power Plan the Council reduced the amount of hydro capacity in its resource portfolio to 250 megawatts because of environmental concerns. The Council stated that it would reevaluate this figure based on the results of the Hydro Assessment Study.

IV. ALTERNATIVES

o Limit actions to Columbia River Basin.

The Council could choose to designate protected areas only within the Columbia River Basin. The protected areas concept was originally part of the Fish and Wildlife Program, applicable only to the Columbia River and its tributaries. However, as explained above, the staff believes that if the Council limits its action to the Columbia River Basin, development pressure could be shifted outside the basin. For this reason the staff does not recommend this alternative.

o Delay action until system planning is finished.

It could be argued that the Council should wait until the results of the system planning process are available before it designates protected areas. With the results of system planning in hand, the Council would have more certain knowledge of the specific areas within subbasins that will be needed to achieve the doubling goal. Having that information, the Council could judge more precisely those areas needed to reach the goal. However, as stated above, until the subbasin plans are completed, there is a great deal of uncertainty as to the habitat available for increased production and whether or not that habitat will be sufficient to allow achievement of the doubling goal. Without protection, habitat that might be necessary to meet the goal could be lost.

In addition, system planning only applies to the salmon and steelhead stocks of the Columbia River Basin. Delaying protected areas until it is finished would not provide any protection to resident fish and wildlife within the basin, and would leave the rest of the region unprotected for no apparent reason. For these reasons, the staff does not recommend this alternative.

o Protect only areas currently used by anadromous fish.

The Council could choose to apply the protected areas concept only to areas currently containing anadromous fish. It could be argued that this would be consistent with the Act, since the Act puts special emphasis on anadromous fish. This alternative would reduce by approximately one half the hydropower capacity that would be affected by protected areas.

However, this alternative ignores the possible effects of hydropower development on resident fish and wildlife, an area in which the Council's program anticipates large expenditures of ratepayer funds. In addition, although the Act directs the Council to give special

consideration to anadromous fish, rehabilitating resident fish and wildlife is clearly within the Council's obligation. The Council recognized this in both the Power Plan and Fish and Wildlife Program at the time it adopted the protected areas and site ranking measures and in approving the Hydro Assessment Workplan.

- o Use criteria requiring the presence of anadromous fish plus resident fish and wildlife for designation of protected areas.

The criteria proposed by the staff call for protection of either anadromous fish or resident fish, and wildlife. The Council could consider criteria in which only areas that contain anadromous fish plus important species of resident fish and wildlife would be considered for protection. Potential anadromous fish habitat in the Columbia River Basin would be excluded. This would result in a significant reduction in the amount of new hydropower that would be affected by designating protected areas. For example, on a regionwide basis this alternative would reduce the percentage of stream miles affected by protected areas from 26 percent to 4 percent. An additional 1307 megawatts and 701 average megawatts should be left open under this alternative.

However, for all of the reasons discussed above, this alternative would not provide significant protection to fish and wildlife resources and could lead to significant loss of habitat which may be necessary to meet the Council's goal of doubling salmon and steelhead runs in the Columbia River Basin.

- o Broaden protection for resident fish and wildlife.

As stated in the proposal section of this document, the criteria recommended for resident fish and wildlife do not represent all areas that states have designated as their high value sites. Instead, the states recommended a subset of those sites representing only the highest value sites. In part, these recommendations were based on the recognition by the fish and wildlife agencies that it is often easier to mitigate for damages to resident fish and wildlife than for anadromous fish. Indeed, in some cases hydroelectric development can be beneficial to some resident species. Because the staff proposal is based on the recommendations of the states and their respective fish and wildlife agencies and because significant resident fish and wildlife habitat will be protected through the anadromous criteria, the staff does not recommend this alternative.

- o Broaden criteria to include non-fish and wildlife values.

As discussed in the body of this document, during the course of the Hydro Assessment Study data was collected on a number of non-fish

and wildlife values. These included recreational values, cultural values and natural features values. The Council collected this information to help increase the accuracy of hydropower forecasts (see pp. 4-6), but stated in both the Power Plan and Fish and Wildlife Program that protected areas would be based only on fish and wildlife values. During the past several years some have argued that the Council should make use of these other values in designating protected areas.

The staff does not recommend this course of action since preliminary analysis of the data indicates that more than 80 percent of the recreational and cultural areas, and 70 percent of the natural features identified as high value sites would be included in the protected areas if the Council followed the staff proposal. The inclusion of all high value non-fish and wildlife values would cause an additional 639 average megawatts of energy to be impacted.

o No action.

The Council could decide that taking action on protected areas is unnecessary. Some might argue that this would be appropriate given the existence of state and federal hydroelectric power licensing processes. The major advantage to this action is that it could help some developers avoid impaired investments in proposed projects that fall within protected areas. However, by taking this course of action the Council would lose an important means of ensuring the protection of ratepayer investments in fish and wildlife rehabilitation and would miss an opportunity to provide systematic basinwide information to the Federal Energy Regulatory Commission for use in its hydroelectric licensing process. This would reduce chances that licensing decisions would be consistent with the Council's Plan and Program. For this reason the staff does not recommend this course of action.

Attachment 1. Legal Considerations Underlying Protected Area and Site Ranking Designations.

1. Protected area designations within the Columbia River Basin.

The Northwest Power Act directs the Council to develop a "program to protect, mitigate, and enhance fish and wildlife, including related spawning grounds and habitat, on the Columbia River and its tributaries."[1] Congress did not give the Council a specific definition of "protect, mitigate, and enhance," but left the Council flexibility to devise "effective and imaginative measures that are also reasonable and will not result in unreasonable power shortages or loss of power revenue."[2] If the Council finds that designating protected areas will help fish and wildlife, their spawning grounds or habitat, and will not cause unreasonable power shortages or lost power revenues, protected area designations would be within the Council's mandate.

Protected area designations are not zoning classifications that in themselves prevent or permit hydropower development. Rather, protected area designations establish standards to be applied by certain federal agencies consistent with their obligations under the Northwest Power Act and other laws.

Certain federal agencies in the Columbia River Basin have responsibilities under the Northwest Power Act and the Columbia River Basin Fish and Wildlife Program that would come into play in several ways if the Council designates protected areas.

First, the Bonneville Power Administration would be obliged to act consistently with the protected area designations generally;[3] and specifically, Bonneville acquisitions of power resources would have to be consistent with protected area designations.[4] This obligation would apply to any relevant power system planning, operations or regulation.[5]

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1 16 U.S.C. 839b(h)(1)(A) (emphasis added).

2 H.R. Rep. 96-976, Part I, 96th Cong. 2d Sess. (Commerce Committee Report) p. 57 (1980).

3 Bonneville must use its fund and other authorities consistent with the protected area designations. See 16 U.S.C. 839b(h)(10)(A).

4 See 16 U.S.C. 839d.

5 See Columbia River Basin Fish and Wildlife Program, sections 1203(a)(1), 1203(a)(3).

Second, Bonneville, the Federal Energy Regulatory Commission, the U.S Army Corps of Engineers, the U.S. Bureau of Reclamation, and other federal agencies that manage, operate, or regulate hydroelectric facilities in the Basin would have to take the protected area designations into account "to the fullest extent practicable."[6] In the program the Council has indicated its expectation that these agencies would provide plans indicating that they will implement the protected area designations in permit, license or exemption or other relevant proceedings, or provide explanations and supporting information why it will not be physically, legally or otherwise possible to implement the designations. These plans should include a description of possible allowances available to permit implementation.[7] In the case of the Federal Energy Regulatory Commission, these obligations would be buttressed by the Electric Consumers Protection Act, discussed below.

2. Protected area designations outside the Columbia River Basin.

Under the Northwest Power Act, the Council's Power Plan, which covers the entire Pacific Northwest region,[8] must include a:

> [G]eneral scheme for implementing conservation measures and developing resources pursuant to section 6 of this Act to reduce or meet the Administrator's obligations with due consideration by the Council for (A) environmental quality, (B) compatibility with the existing regional power system, (C) protection, mitigation and enhancement of fish and wildlife and related spawning grounds and habitat, including sufficient quantity and quality of flows for successful migration, survival and propagation of anadromous fish, and (D) other criteria which may be set forth in the plan.[9]

Designating protected areas could preserve environmental quality, and protect, mitigate and enhance fish and wildlife, their spawning

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6 See 16 U.S.C. 839b(h)(11)(A)(ii).

7 See Columbia River Basin Fish and Wildlife Program Section 1203(a)(4) (1987).

8 The region consists of the States of Oregon, Washington and Idaho, the portion of Montana that is west of the continental divide, and those parts of Wyoming, Utah, and Nevada that are within the Columbia River Basin. See 16 U.S.C. 839a(14). The Oregon coast and Puget Sound in Washington, for example, are within the region but not within the Columbia River Basin.

9 16 U.S.C. 839b(e)(2).

grounds and habitat. Moreover, if protected areas were designated only inside the Columbia River Basin, development might simply be pushed out of the Basin and into the rest of the region. In this sense, designating protected areas regionwide could mitigate potential incompatibilities with the existing regional power system resulting from unbalanced system development.

Outside the Columbia River Basin, protected areas designations would have two kinds of legal consequences. First, as with areas inside the Columbia River Basin, Bonneville's acquisition of power resources would have to be consistent with the protected area designations.[10]

Second, the provisions of the Electric Consumers Protection Act of 1986 apply to Federal Energy Regulatory Commission proceedings for sites outside the Columbia River Basin. The Electric Consumers Protection Act requires the Commission to give "equal consideration" to energy conservation, fish and wildlife (including their spawning grounds and habitat), recreation, and other aspects of environmental quality in licensing determinations.[11] In carrying out this responsibility, the Commission must ensure that hydropower projects are:

> [B]est adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water-power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes....[12]

The Commission has found that the Council's Fish and Wildlife Program and Power Plan are "comprehensive plans" for purposes of this section.[13] Accordingly, in determining whether to issue hydroelectric project licenses, the Council expects that the Commission will carefully consider the extent to which proposed projects are consistent with protected area designations throughout the Basin.

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10 See 16 U.S.C. 839d.

11 See 16 U.S.C. 797(e).

12 16 U.S.C. 803(a)(1) (emphasis added).

13 See Utah Power & Light Co., Proj. No. 2381-001, Order Issuing New License at 5, ___ FERC ___ (Aug. 3, 1987).

3. State protection.

The Council's protected areas process is in some ways a starting point. The states, too, are considering designating areas to be protected from hydroelectric development. Under the Electric Consumers Protection Act of 1986, discussed above, states have the ability to propose restricting small hydropower development in areas with "unique natural, recreational, cultural, or scenic attributes."[14] Such designations could be made either within the Columbia River Basin and beyond it. The state agency processes are independent of the Council's, and the Council's action on protected areas in no sense predetermines any state agency decisions. However, if the state agencies choose to act on this subject, they could add a layer of protection for uniquely valuable areas.

Finally, Oregon law obliges various Oregon agencies to use the Council's Fish and Wildlife Program as a minimum standard in evaluating proposals for hydroelectric development.[15] Accordingly, in areas of Oregon within the Columbia River Basin, we expect that Oregon agencies would require new hydroelectric projects to be consistent with protected areas designations.

4. Consequences of protected area designations for federal land management agencies.

The U.S. Forest Service and the U.S. Bureau of Land Management have statutory obligations to coordinate their natural resource plans with planning processes like the Council's.[16] Staff expects that these agencies will coordinate their plans with the protected areas designations.

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14 16 U.S.C. 824a-3(j).

15 See ORS 469.371(1)(b), 543.017(1)(b), 468.732(1)(c).

16 See Forest and Rangeland Renewable Resources Planning Act, 16 U.S.C. 1604(a) (Forest Service), and Federal Land Policy and Management Act of 1976, 43 U.S.C. 1712(c)(9) (Bureau of Land Management).

ATTACHMENT 2

FIGURES

Figure 1

NUMBER OF PROJECTS POTENTIALLY AFFECTED BY PROPOSED CRITERIA

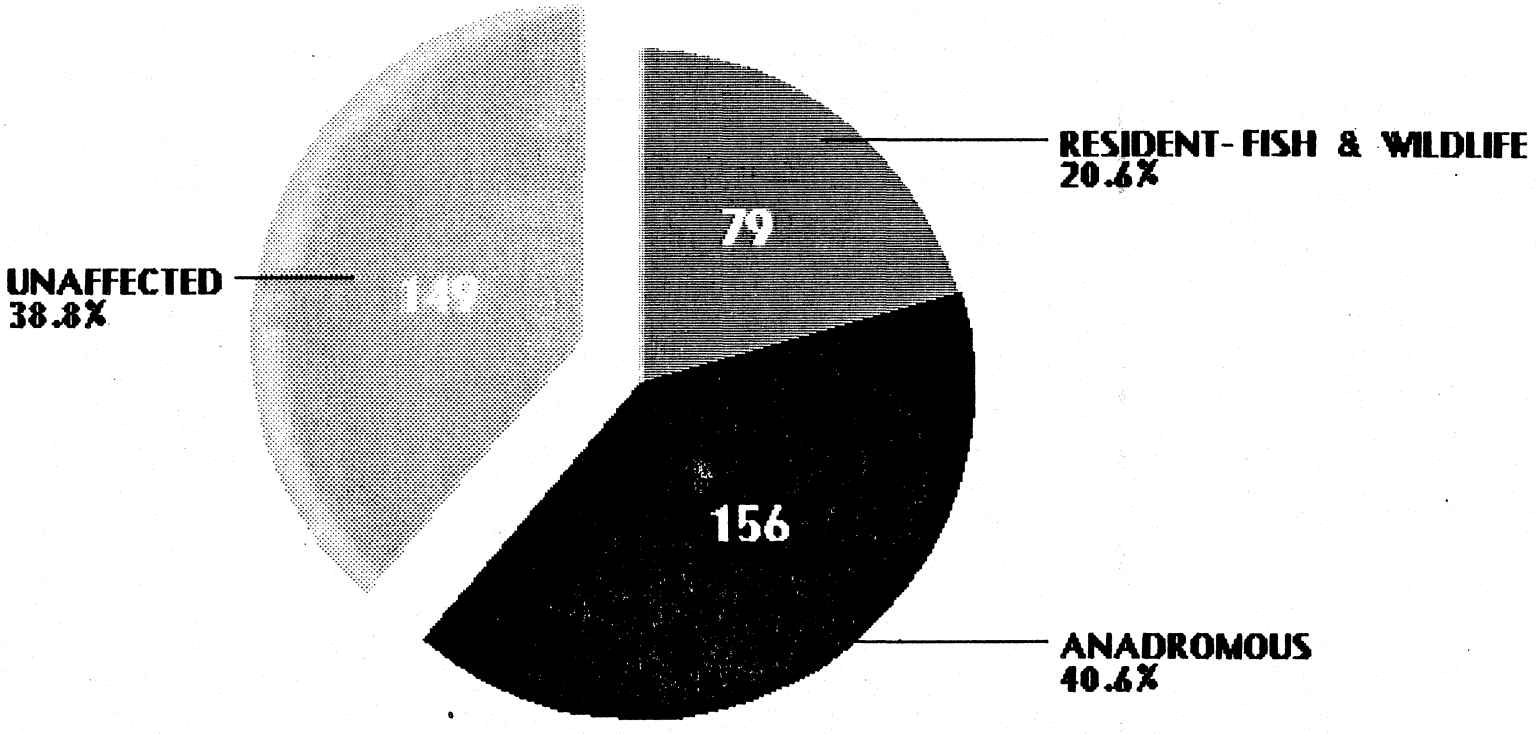
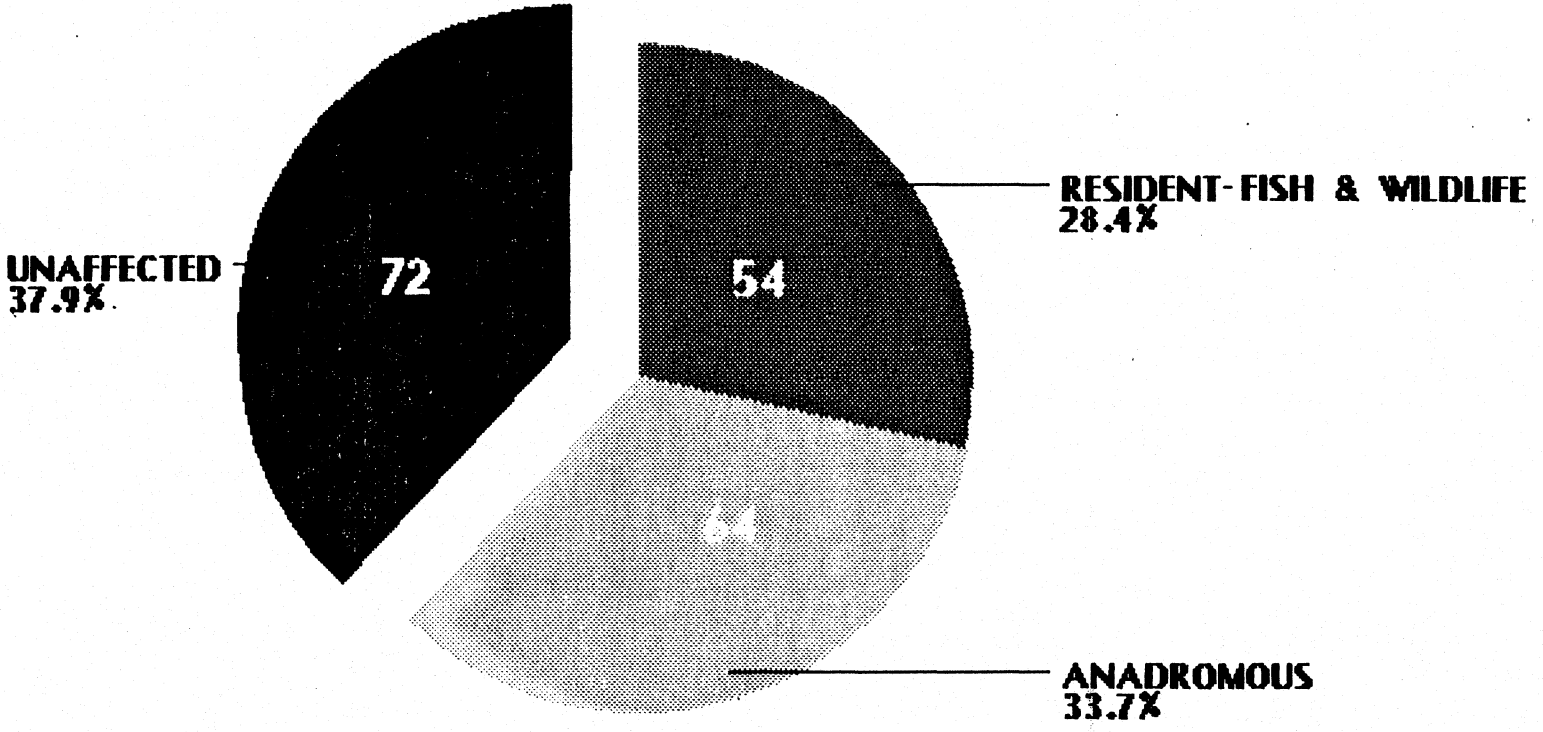


Figure 2

NUMBER OF PROJECTS POTENTIALLY AFFECTED BY PROPOSED CRITERIA



IN BASIN

Figure 3

NUMBER OF PROJECTS POTENTIALLY AFFECTED BY PROPOSED CRITERIA

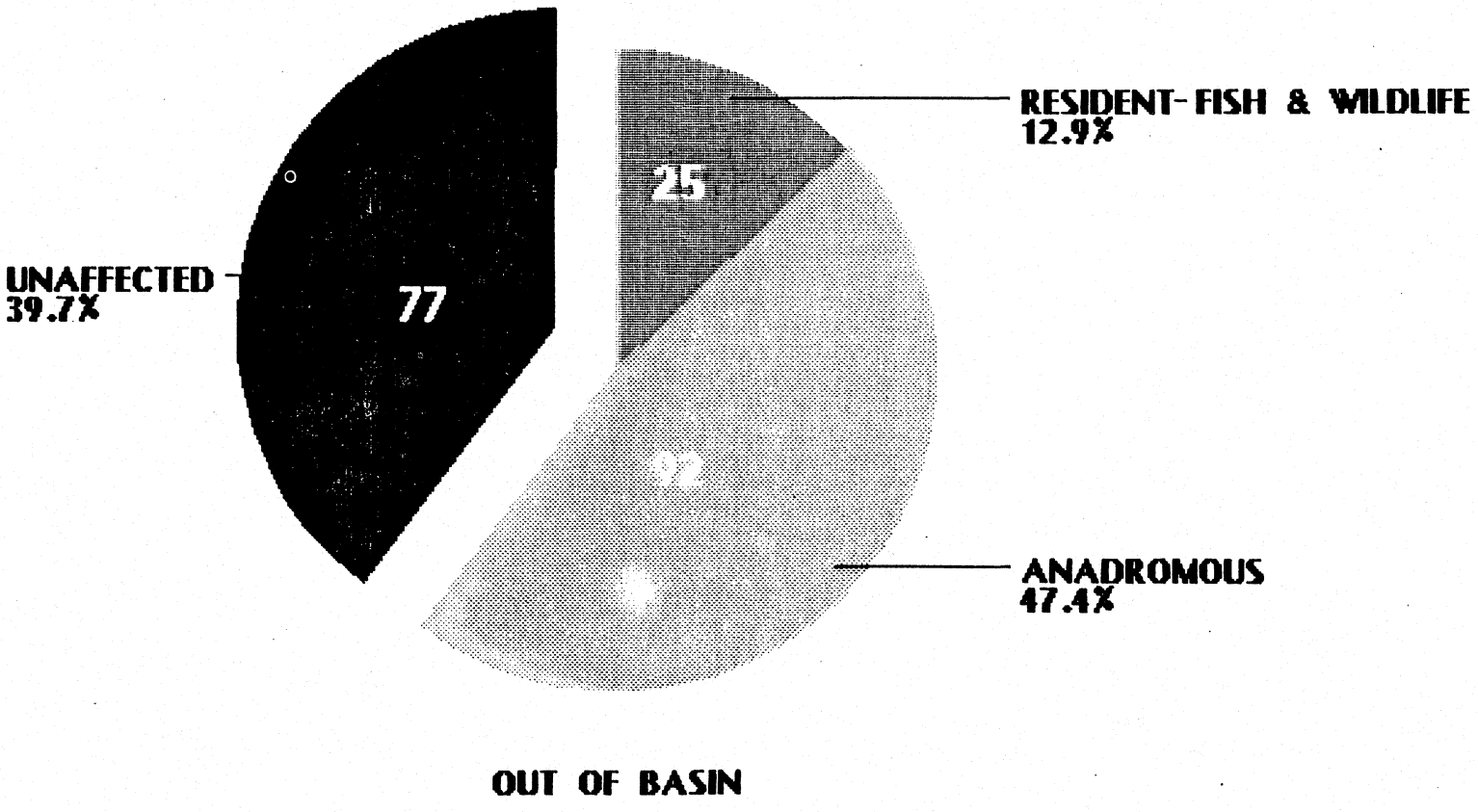


Figure 4

CAPACITY (MW) POTENTIALLY AFFECTED BY PROPOSED CRITERIA

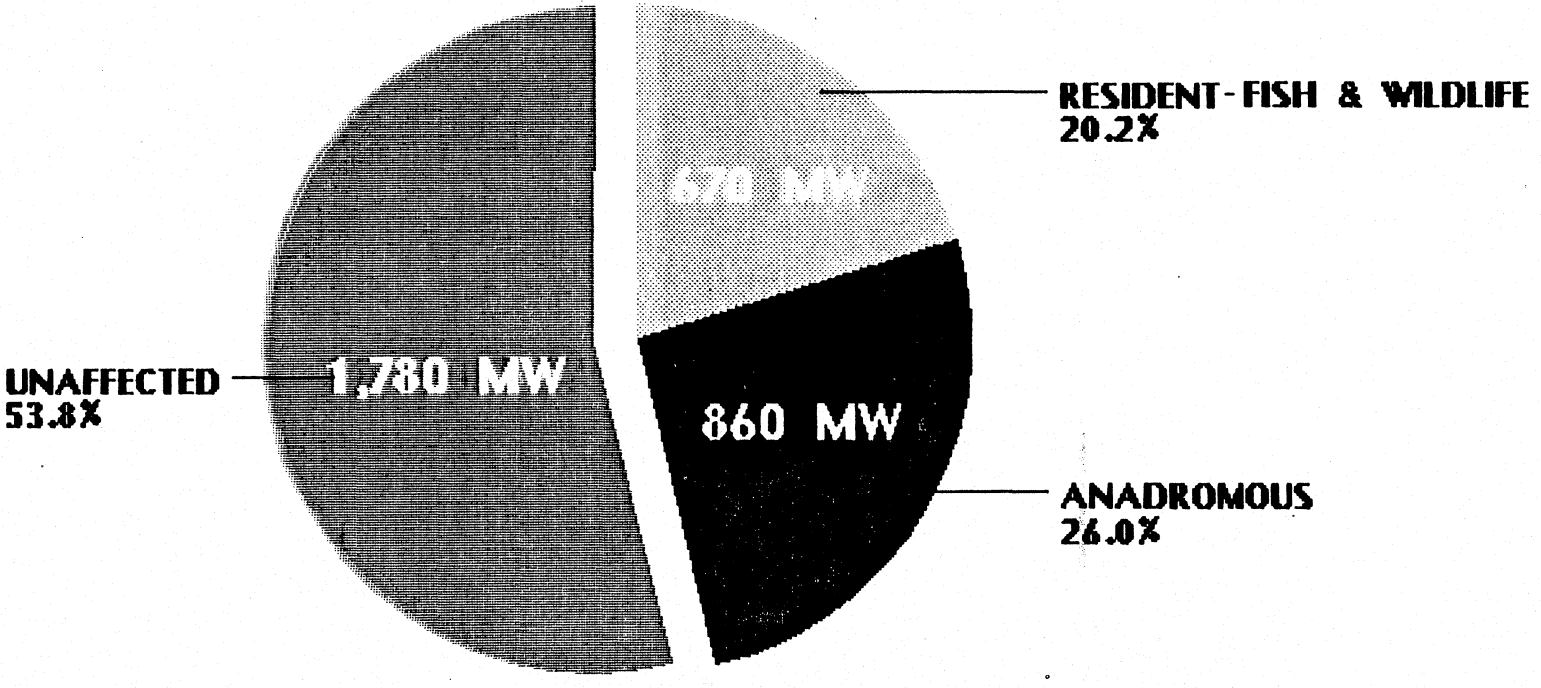
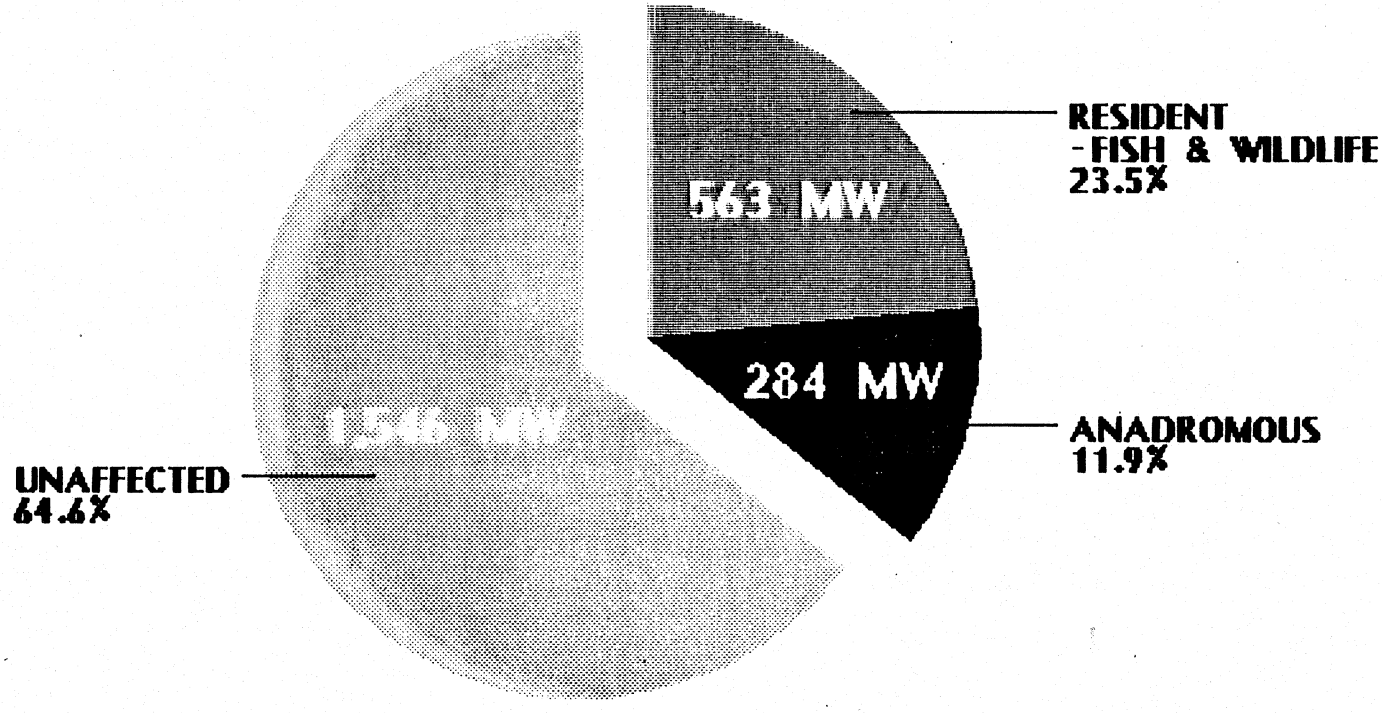


Figure 5

CAPACITY (MW) POTENTIALLY AFFECTED BY PROPOSED CRITERIA



IN BASIN

Figure 6

CAPACITY (MW) POTENTIALLY AFFECTED BY PROPOSED CRITERIA

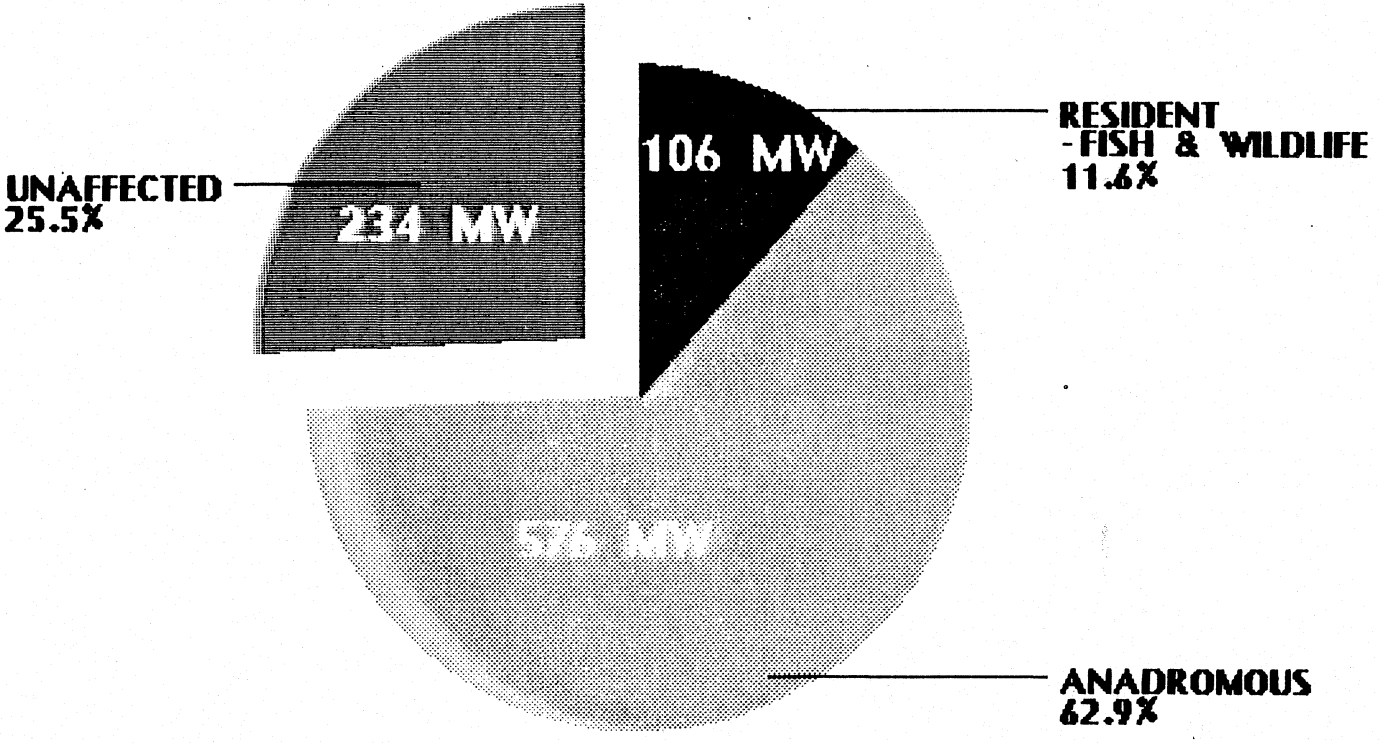


Figure 7

ENERGY (AVERAGE MW) POTENTIALLY AFFECTED BY PROPOSED CRITERIA

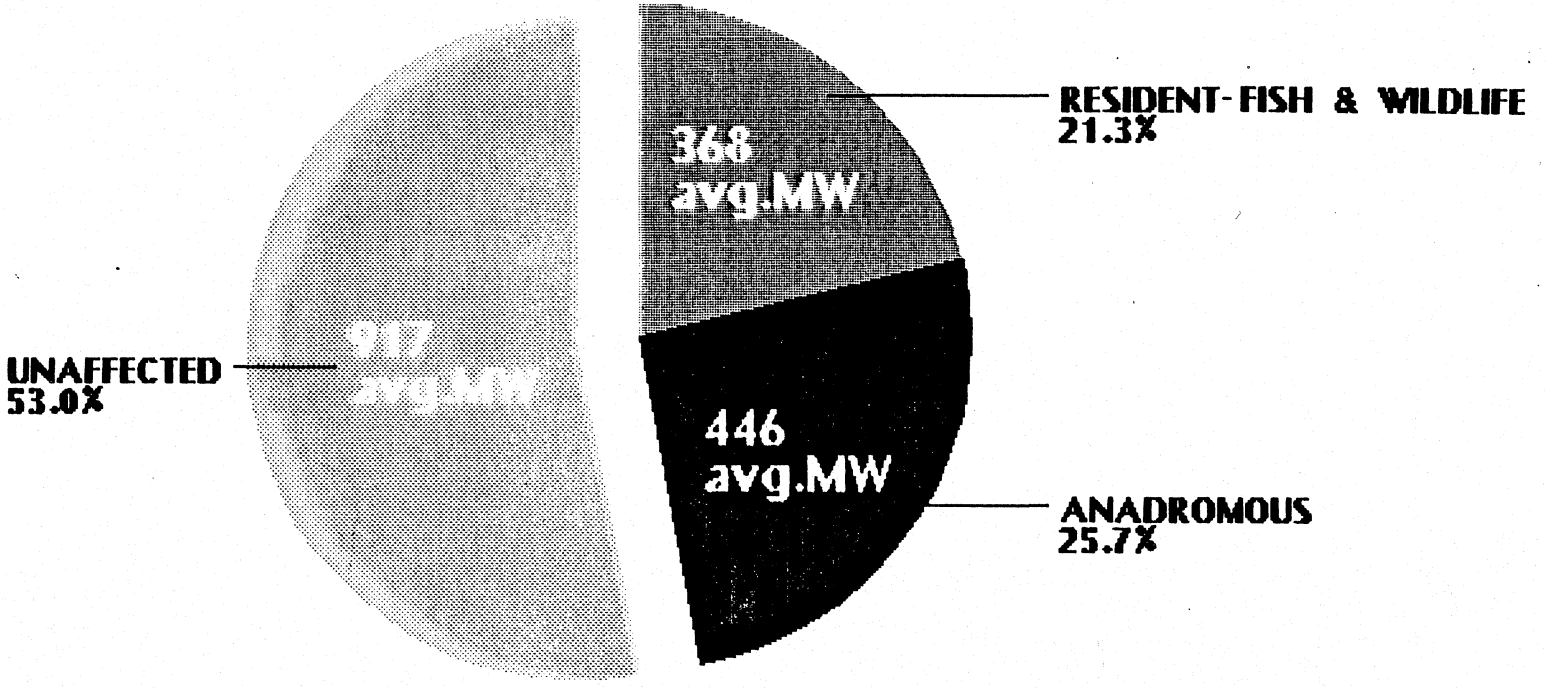


Figure 8

ENERGY (AVERAGE MW) POTENTIALLY AFFECTED BY PROPOSED CRITERIA

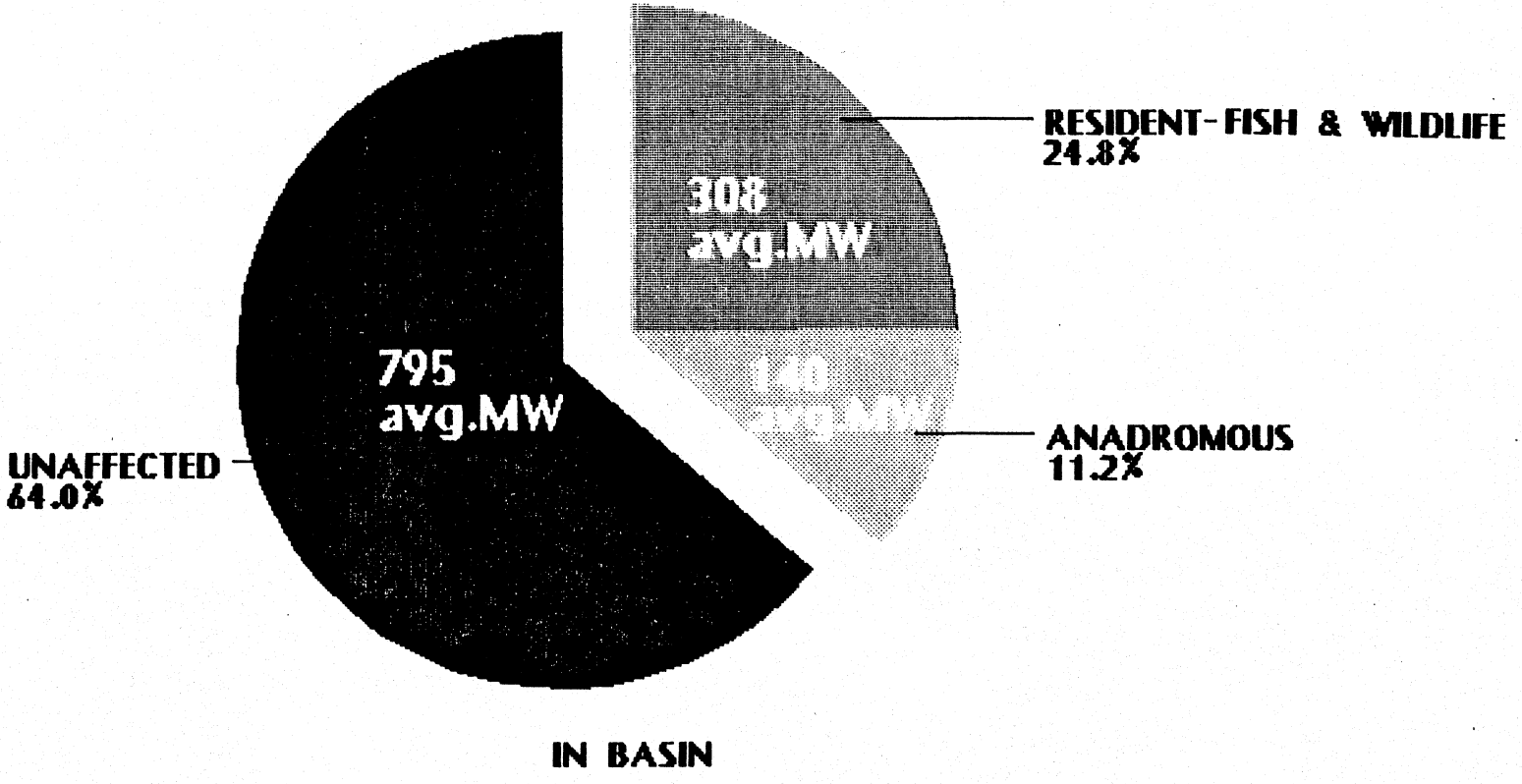
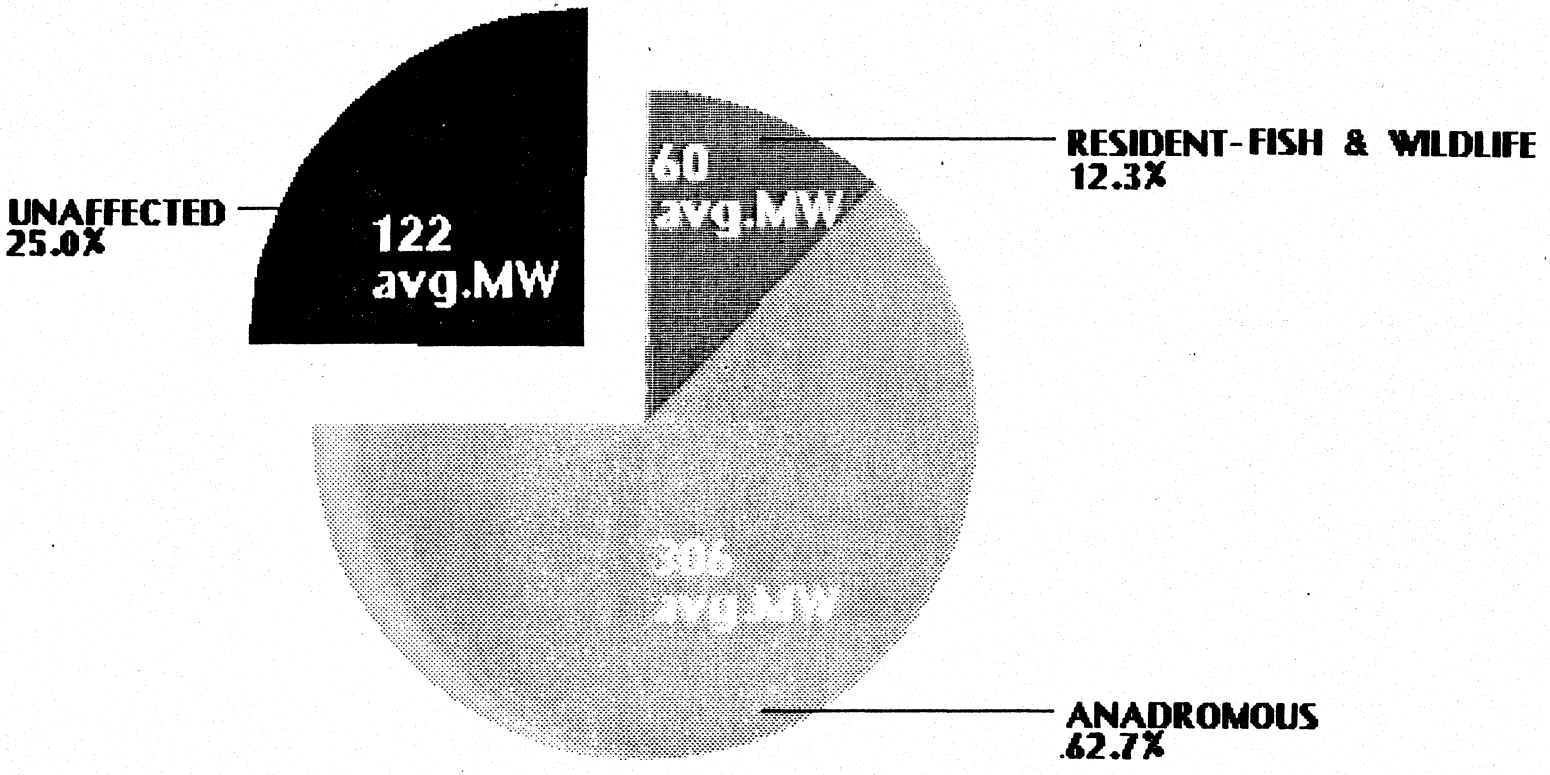


Figure 9

ENERGY (AVERAGE MW) POTENTIALLY AFFECTED BY PROPOSED CRITERIA



OUT OF BASIN