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OREGON DEPARTMENT OF FISH AND WILDLIFE

**A STUDY OF FISH RESOURCE RELATED REVENUES AND COSTS:
SOURCES, USES, AND BENEFITS**

Oregon Coastal Zone Management Association

1993



Oregon Coastal Zone Management Association, Inc.

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March 1, 1993

Mr. Randy Fisher, Director
Oregon Department of Fish and Wildlife
P.O. Box 59
Portland, OR 97207

Re: Fish Resource Related Revenues and Costs Study

Dear Randy:

This letter transmits a study report pursuant to a legislative directive provided by the 66th Legislative Assembly as part of the budget narrative to the Department's funding bill. Despite the tendency to oversimplify conclusions based on an extremely difficult issue to analyze, it appears that, in a nutshell:

- General taxes do not cover fish resource related Department expenditures made to benefit the general public.
- State user fees, paid by both sport anglers and the commercial fishing industry, do not cover Department expenditures made to benefit these users.
- Federal funds are the largest single category of revenue that balance expenditures made to benefit the general public and users.
- Declining resource access and use due to changes in natural resource management objectives will result in a decrease in user revenue base.
- Rising expectations of the general public for increased expenditures for stewardship responsibilities toward non-consumptive uses will require the Department to find other sources of revenue and/or a larger share of general tax support absent of cutting Department service.

We are prepared to personally explain study results as needed to assist in understanding the information and policy issues contained in the report. Thank you for the opportunity to assist the Department on this project.

Sincerely,

Jay L. Rasmussen, Director
JR:kco

OREGON DEPARTMENT OF FISH AND WILDLIFE

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SOURCES, USES, AND BENEFITS

prepared for

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1993

PREFACE

Considerable attention was focused by the Natural Resources and Economic Development Subcommittee of the Joint Committee on Ways and Means during the 1991 Oregon legislative session on projected shortfalls within the Oregon Department of Fish and Wildlife's 1991-93 budget. The shortfalls, which would have reduced some of the Department's activities, including closures of two public hatcheries, were projected to result from reductions in available General Funds caused by Measure 5. To help offset this shortfall, the legislature considered increased fees on commercial fisheries and on hunting.

Passage of Senate Bill 1202 provided anticipated increased revenues by changing commercial fisheries fees from poundage to ad valorem - with an overall fee increase to some fisheries - and by increases in certain commercial fishing licenses. In the passage of SB1202 and the Department's budget bill (HB5041), discussion ensued regarding the relative contribution of commercial fishing to the costs of the management of fisheries. As a result of that discussion, a budget note was added to the budget narrative of HB5041 that requested an analysis of the relationship of sport and commercial fees to the costs and benefits of the Department's fish resource programs since the merger of fish and wildlife in 1976.

ACKNOWLEDGMENTS

The Oregon Coastal Zone Management Association (OCZMA) was asked to undertake the objective assessment as directed by the legislatively directed budget note. The OCZMA contracted with The Research Group, Corvallis, Oregon, for assistance on the project. Shannon Davis, Hans Radtke, and Linda Snow were the principal consultants for the report. Kari Olsen from The Research Group provided the word processing for report preparation. Personnel from the Legislative Fiscal Office that contributed to the project were Ann Glaze and Michael Stinson. Nan Evans from the Executive Department assisted with historical budget interpretations. Oregon Department of Fish and Wildlife (Department) personnel helpful in providing information for the project were: Karen Pagh, Shannon Spencer, Tom Lichatowich, Kay Brown, Sharon Conyers, and Janet Rafalovich. Chris Carter was the Department's contact on the project and contributed substantially to the report's chapter on economics. Randy Fisher, Department Director, and Jim Martin, Chief of the Fish Division, need to be recognized for their patience in educating the authors about such a large and complex organization. Irrespective of the close working relationship with the Department, the analysis and its interpretations and all other report contents remain the sole responsibility of the OCZMA and the report's authors.

Jay Rasmussen, Executive Director
OCZMA

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- B. Other Fund Revenue Source Descriptions
- C. Definition of Economic Terms
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- E. Program Funding for the 1987-89 and 1989-91 Bienniums
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EXECUTIVE SUMMARY

The 1991 Oregon Legislature instructed the Department of Fish and Wildlife (Department) to analyze how fees derived from commercial and sport fishing users have historically supported fishery related activities, assess the economic benefits of fishery related activities, and make findings about financing methods and program support to improve accountability and understanding of Department activities.¹

The responsibility for completing the Study was assigned to the Oregon Coastal Zone Management Association (OCZMA), Newport, Oregon through an intergovernmental agreement. The OCZMA retained The Research Group, Corvallis, Oregon to assist in the investigation.

A large amount of historical data on revenues and costs of the Department's fish resource programs were collected and summarized. Specific analyses of programs were prepared to show how revenues and costs are related to those that benefit from fish resource management. A number of questions were addressed concerning user fees.

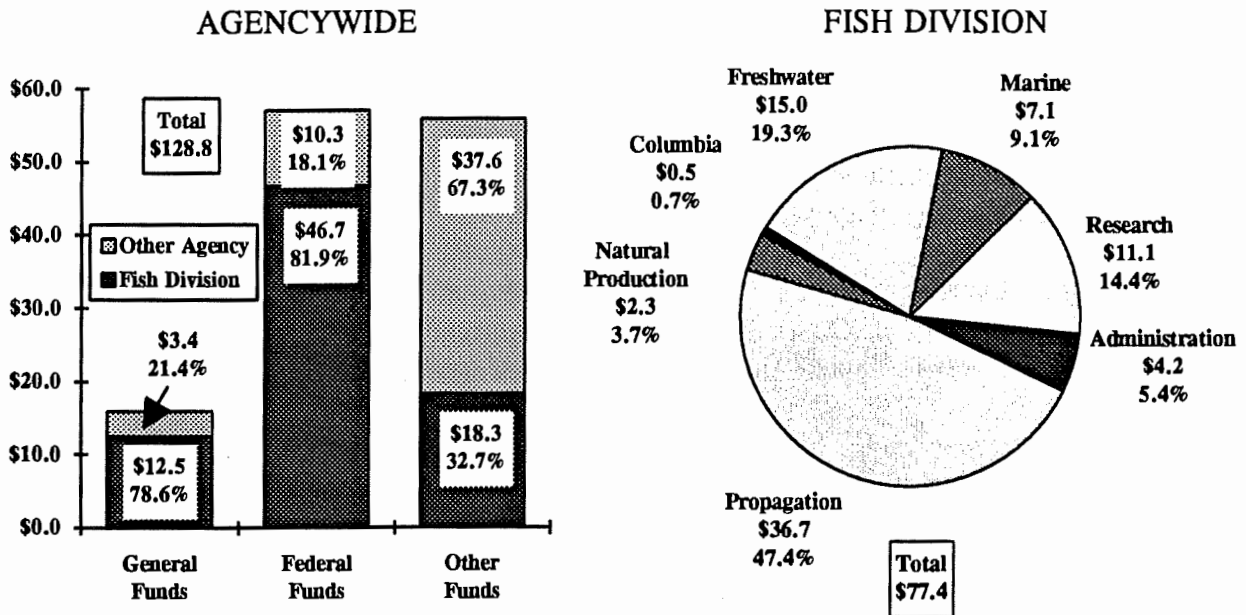
- What distinguishes fish resource programs from other programs being offered by the Department?
- What proportion of the revenues and costs of fish resource programs are represented by user fees?
- How are costs borne by the user distinguished from costs supported by the general public?
- What are the implications of declining fish resource availability and user-based revenues.

Fish Resource Related Department Programs

The Department is comprised of four divisions and had a legislatively approved operating budget in the 1991-93 Biennium of \$128.8 million with 1,013 FTE positions. The Department's budget also contained funds for the State Police Fish and Wildlife Division, Capital Improvements, and Capital Construction. The total biennium budget was \$154.3 million. The Fish Division represents 60.1% or \$77.4 million of the operating budgeted expenditures. The accompanying figure on page viii shows the Fish Division 1991-93 Biennium budget in relation to the Departments.

1. The Joint Committee on Ways and Means in the 66th Legislative Assembly, Subcommittee on Natural Resources and Economic Development, added the following budget note. "The Department is directed to undertake a study of the relationship of sport and commercial fees to the costs, production, and benefits of the fish programs since the merger of fish and wildlife in 1976, subject to the availability of records. The study should assess the complete costs of fishery management and other fishery-related activities. The study should be used as the basis for a new fee structure, if needed, in 1993."

DEPARTMENT AND FISH DIVISION 1991-93 BIENNIUM BUDGET



- Notes: 1. In millions of dollars.
 2. Legislatively approved September 1991.
 3. Excludes capital projects and Oregon State Police Fish and Wildlife Division.

Activities related to fish resources are directly associated with seven programs in the Fish Division under the current Department organization. The programs are: Fish Research and Development, Fish Propagation, Marine Resources, Freshwater Resources, Columbia River Management, Fish Administration, and Natural Production. Other Department divisions most closely aligned with fish resources are the Habitat Conservation Division and the Administration Division. Dollars budgeted for capital facilities related to fish resources are in the Capital Improvements and Capital Construction program areas. When considering all Fish Division and other division programs, fish resource related expenditures are about 2/3 of the Department's budget and the Fish Propagation program is about 1/2 of that amount. The study discussed the purpose, historical budget levels, and selected example products for each of the program areas.

Funds Summary

The Department categorizes revenues according to three summary funds: General Funds, Federal Funds, and Other Funds. General Funds include general taxes and may be spent for the general operation of the Department without restriction; however, sometimes General Funds must be used to match federal or other funds awarded to the State. Federal funds generally must be spent for specific purposes or projects. The Other Funds category of revenue to the Department consists of user fees and other miscellaneous revenues. Not all miscellaneous revenue goes directly to fund Department programs, some goes directly to Department administration. Some user fees and other revenues, such as commercial fishing

industry fees, are deposited into the State General Fund, and are theoretically available for use by all State departments according to legislative appropriation. In reality, these funds have always returned to the Department.

The receipts from Department user fees and other sources of revenue are deposited into several state accounts and funds. The receiving account determines how the monies are spent. Besides the General Fund, some fish and wildlife user fees find their way into the Commercial Fisheries Fund, the Fish Endowment Account, the Wildlife Fund, the Non-game Wildlife Fund, and the Hydroelectric Fund. In some cases it is only interest received on user fees that is deposited into the various funds. The report provides summaries of each account and explains which monies go into the accounts, and what restrictions exist for the expenditure of those funds.

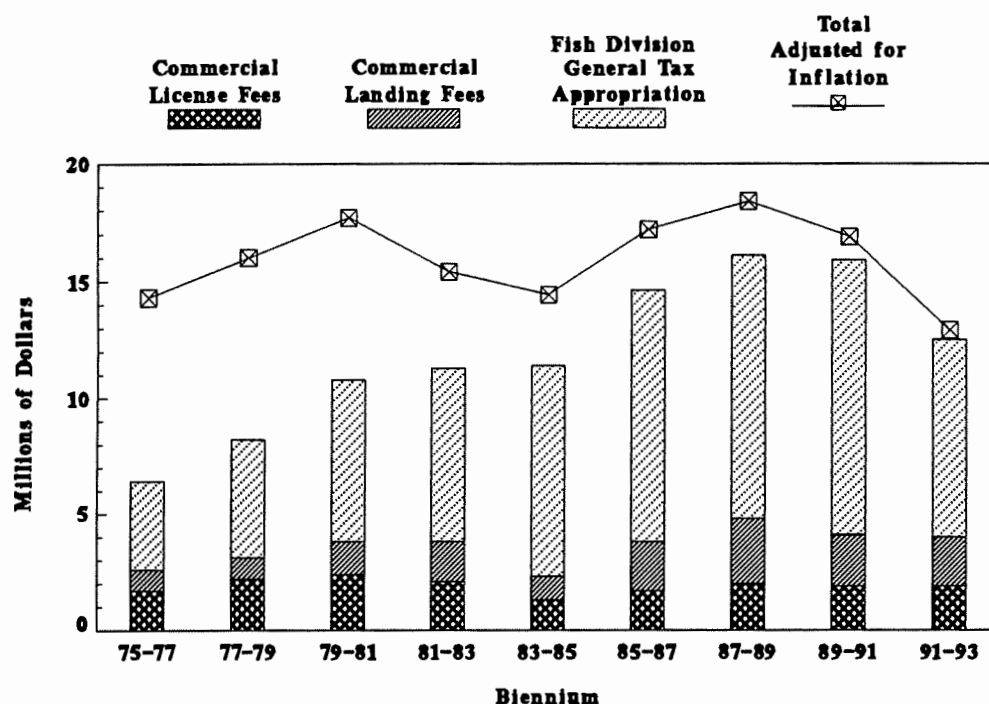
The accompanying figure on page x is a historical depiction of the Fish Division's General Fund over the last 8 bienniums. Considering adjustment for inflation, the figure shows that the most recent biennium has a General Fund contribution that is approximately 30% less than the highest contribution in the 1987-89 Biennium. Most of this General Fund reduction is from general tax support which was cut \$2.3 million from the 1989-91 legislatively authorized budget.

Relationship of User Fees and Program Costs

The term user fee can refer to everything from park admissions fees to property taxes used to finance public education. Taxes, on the other hand, are generally considered assessments levied to the public as a whole for services benefiting the public as a whole. Fees are charged by the Department to commercial and sport fishermen. Since there is restricted access to nearly all fisheries, i.e. one must possess a license for the opportunity to participate in fishing, fishing user benefits do not directly accrue to the general public. Those who pay the permit and license fees receive the direct benefits of access to the fishery, which includes the services of fishery management, enhancement and research. There are, however, many activities in which the Department participates, including user management, that benefit the general public in the form of economic development and environmental enjoyment. A partial list of activities includes:

- recreational boating facility construction
- education about environmental conservation practices
- provide fish research
- assist others in water resources and water quality planning
- develop recovery plans for fish and wildlife species and assist in developing management plans for timber and other resources
- develop general guidelines for habitat protection
- evaluate habitat and resource use plans developed by others
- maintain habitat inventory system

Fish Division General Fund Budget



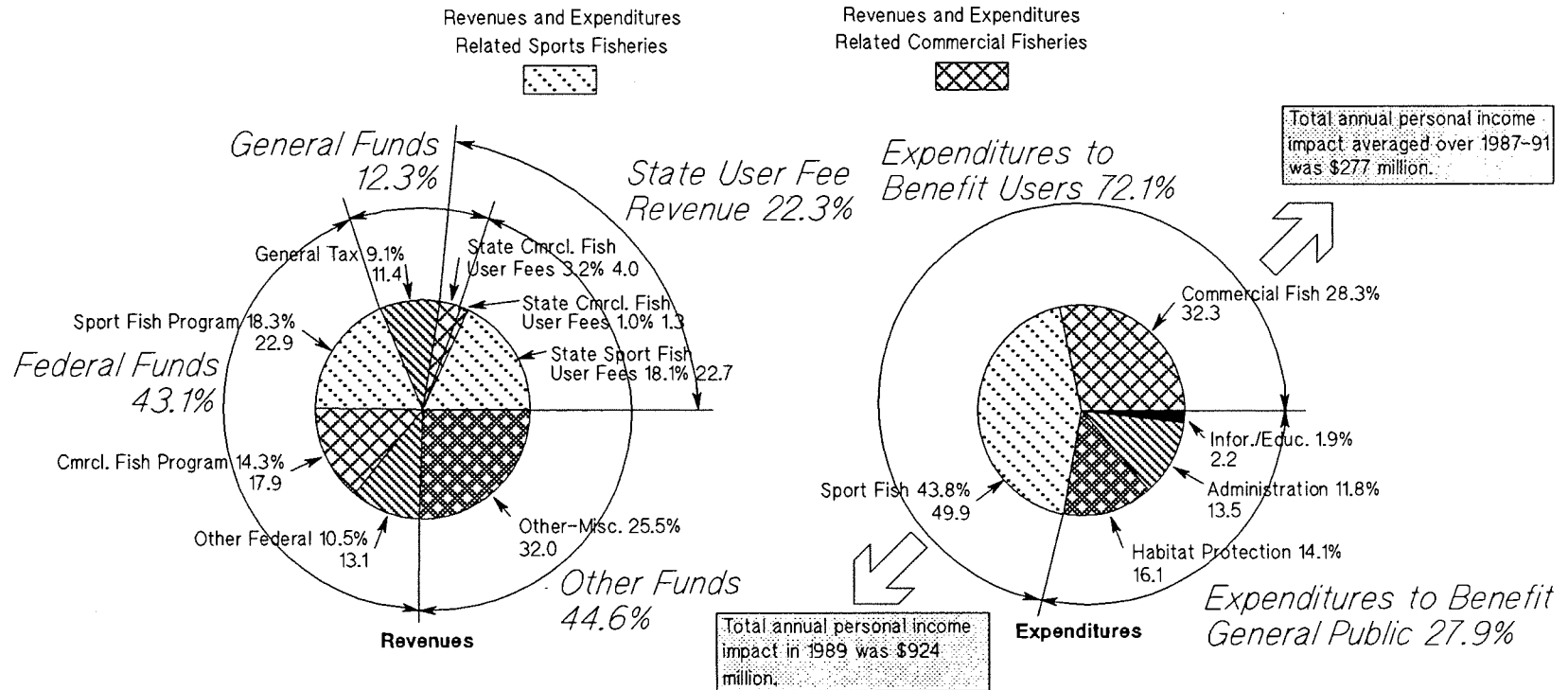
- Notes:
1. Figures represent the appropriation in the legislatively approved budget for the Fish Division or its predecessor under different Department organization.
 2. Inflation adjustment uses gross national product implicit price deflator developed by U.S. Bureau of Economic Analysis (1992 is 100).

The questions of the level and when user fees should be charged, and how they can be dedicated to certain purposes has fueled an entire field of economic research. It is generally assumed that user fees should be related to either the value of the benefits received by the user, or to the costs to produce those benefits.

The development of a pricing system for the variety of goods and services which the public sector provides is a challenging task for both policy makers and administrators. Public officials cannot expect fishermen to fully pay for the costs of services when the general public also receives some of the benefits. Rather than simply setting prices which will recover all costs of production plus a profit for all goods and services produced, public officials must first determine which products will be priced and what types and percentages of production costs will be recovered.

The State does not prescribe an accounting approach that tracks expenditures for benefit categories. The objectives for the study required estimates of this information. An informal survey of program managers was used to determine the allocation of costs to commercial fish management, sport fish management, habitat protection, information/education, and fish

FISH RESOURCE REVENUES, EXPENDITURES, AND BENEFITS



- Notes:
1. Biennium budgets in millions of dollars.
 2. Revenues are legislatively approved budget September 1991.
 3. Expenditures are biennium estimates February 1993. Administration and OSP estimates are only fish resource related budgeted expenditures.
 4. Some federal funds are derived from user fees, such as Wallop-Breaux grant monies being collected from excise taxes on sports fishing equipment.
 5. State user fees are defined to be licenses, tags, and landing fees.

resource related administration. The last three categories represent benefits accruing to the general public. An accompanying figure on page xi shows the results of the survey.

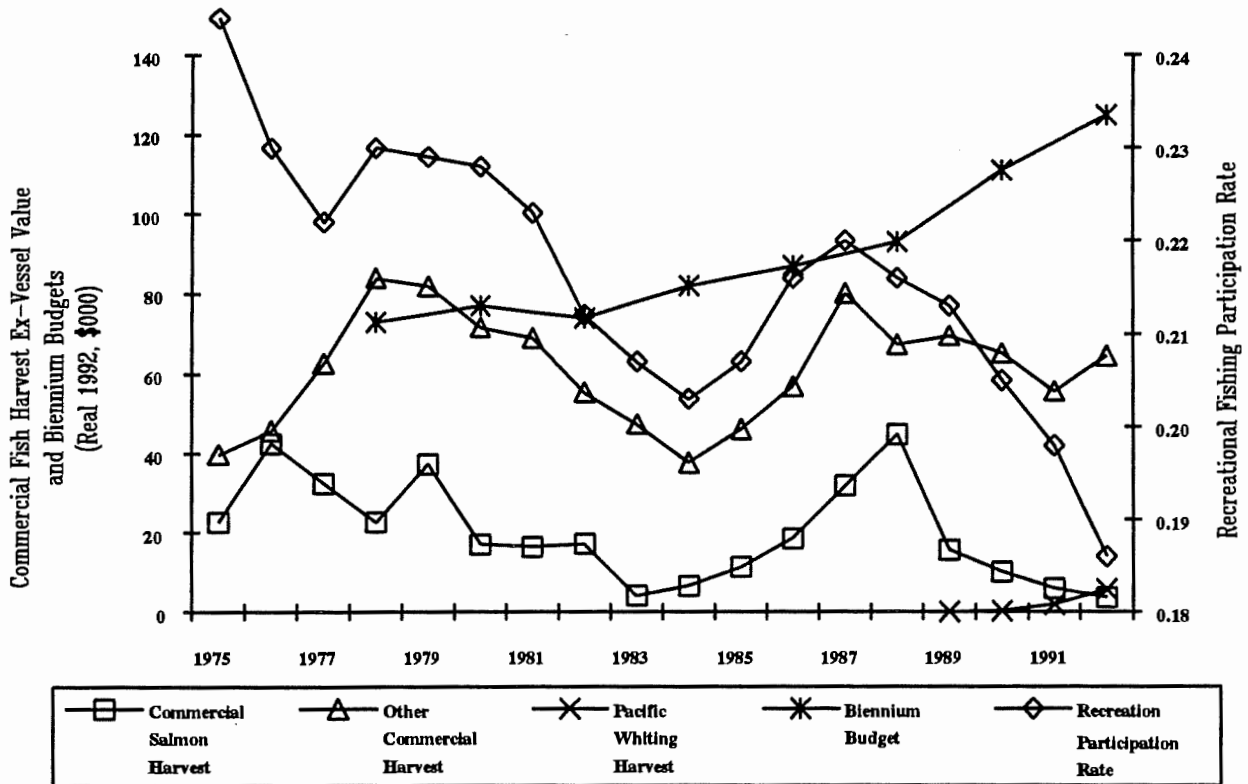
Outlook for Fish Resource User Benefit and General Public Benefit Cost Recovery

An accompanying figure on page xii shows the recreational participation rate of resident angling licenses holders, various commercial harvest ex-vessel values, and the Department's fish resource related budget. Using these factors as indicators, it appears recent trends in fish resource use make user fund sources questionable as a growing financial base to sustain the Department activities.

Fish Propagation Financial Analysis

The first hatcheries in Oregon were built in 1877 on the Clackamas and Rogue rivers for salmon propagation. Several more were constructed in the next few years, and by 1900 all were under government control. The hatcheries remained under either state or federal control

COMMERCIAL FISHING RESOURCE VALUE AND RECREATIONAL FISHING PARTICIPATION RATE



- Notes: 1. Harvest values are adjusted for inflation using the gross national product implicit price deflator developed by the U.S. Bureau of Economic Analysis (1992=100).
 2. The Department's biennium budget is for fish related programs only. The budget amounts are also adjusted for inflation.

until 1971. In 1971 Oregon enacted a law (ORS 508.700) allowing the propagation of chum salmon by private citizens. In 1973 this law was modified by the legislature to include the propagation of coho and chinook salmon. Permission to propagate pink salmon was granted by the legislature in 1979.

In 1980 there were 51 public hatchery facilities in the Columbia Basin (Washington 24, Oregon 17, and Idaho 10) and 12 on the Oregon coast. Private salmon hatcheries in Oregon are all confined to the coastal area. Permits have been issued for release of salmon by private operators at 12 sites. Only one of the permittees is active today. The report describes the 34 Oregon fish hatcheries, including their funding source and production characteristics.

An analysis was performed that allocated costs of fish propagation based on catch. Hatchery operation cost allocations were assigned to General Fund and Other Fund summary sources based on commercial and sport catch, respectively. The Federal Fund and miscellaneous or mostly utility contributed funds were assumed constant for this analysis. This is a somewhat simplistic assumption as the purpose of certain federal and utility support for hatcheries is based on commercial and sport fisheries mitigation of fish habitat loss due to dam projects. The estimated species specific catch was based mostly on 1982-87 brood year coded wire tag recoveries and multi-year catches, however recovery information is not consistent between hatcheries due to differences in the tagging of fish at the various hatcheries. The proportion would be expected to vary as production, harvest abundance, and catch allocation between users change.

The total change with the cost allocation would be a decrease of 44.5% in General Fund support and an increase of 53.7% to Other Fund support. Recognizing that General Funds are approximately 1/3 commercial user fees (including non-anadromous related fees such as groundfish), and Other Funds are approximately 3/5 sport user fees, the analysis suggests that a substantial proportion of General Fund revenues supported hatchery production contributes to the recreational fisheries. This exercise is an example of the variability between the level of contribution of fee revenues, the cost of providing services, and who receives the benefits from the services.

Fish Resource Management and Use Benefits

The quality of Oregon's environmental amenities, including fish resources, enriches the lives of Oregonians and attracts tourists and business. The enjoyment of fish resources provides significant economic contributions to the State's economy. Jobs and income are created through recreational fishing and commercial fish harvesting and processing. In addition to the contribution to the financial flows of revenues, expenditures, and associated personal income created in the economy, the fisheries are highly valued by resource users and Oregon residents. Recreational anglers and Oregon residents received benefits in terms of enjoyment and quality of life above and beyond their participation costs. Some of these benefits can be described as *nonmarket benefits*. These benefits, which can be estimated by indirect methods, are not captured in the estimates of impacts on the State's economy in terms of jobs and

personal income. Because both of these measurements is important to policy making, the report discusses *economic impacts* and *economic valuation*.

Findings and Conclusions

In the course of this analysis, several findings were apparent.

- Economic benefits from Department activities accrue to both users (sport and commercial fishing) of the resource and non-users. Fish resources depend on the quantity and quality of water resources and the non-user of the resource receives, in particular, benefits from protected water resources. Examples of benefits stemming from Department activities related to water use and water quality might include: improvements in water recreation opportunities; improvement in human health; reductions in the water treatment costs for municipal water; increases in sport and commercial fishery yields; as well as increases in aesthetic values related to water quality improvements.
- Economic valuation attempts to measure the benefits received by those that fish and the value people place on fishing. There also may be economic values to "nonusers," i.e. preservation or existence values to people who don't actually fish or even visit Oregon. Economic value benefits from Department activities are difficult to measure quantitatively, although the benefits can be discussed in a qualitative manner. Some estimates of economic values are available as discussed in the report's Chapter V. Economic impacts consider how many people participate in fishing, how much they spend while fishing, and the resulting impact on the local and state economy. This economic yardstick can be measured.
- As a result of earnings generated by the harvesting and processing of commercial fisheries, the average total estimated annual personal income impact in the 1987-91 period was approximately \$277 million dollars per year.^{2,3} The earnings associated with recreational trip expenditures in 1989 generated \$253 million per year in total personal income. Recreational fishing equipment purchased primarily for angling in Oregon is associated with another \$671 million in total personal income impact in 1989.⁴ This \$1,201 million personal income impact from fishing users can be compared to the State's total personal income of \$45.16 billion in 1989. Thus, fishing user economic impacts are 3% of this State total personal income. While this comparison is not strictly valid, it does show the importance of fishing to the State's

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2. Commercial harvests vary considerably due to resource abundance and management user allocations. For example, commercial salmon landings in 1992 were only 21% of the 1987-1991 landings; conversely, in 1988 landings were 136% of this average.
 3. Commercial fishing equipment depreciation is not included.
 4. Recreational fishing equipment includes tackle, clothing, boats, etc. used primarily (over 50% of the time) for fishing. Some purchases are an annual depreciation.

economy.⁵ The importance, on a regional basis, is most felt by coastal and Lower Columbia River communities.

- An informal survey of fish resource program managers determined that overall 72% of Department expenditures were related to users in the 1991-93 Biennium, although the proportion varies by program (e.g. propagation versus habitat conservation). Of this amount, 28% are intended to benefit commercial users and 44% are intended to benefit recreational users. The percentages do not change substantially when Federal Funds are considered. Exclusive of costs paid by Federal Funds, 23% are intended to benefit commercial users and 45% are intended to benefit recreational users.
- A Division level analysis of revenue sources showed that State user fees related to fish resources represented 22% of the Department's fish resource related budget. This does not include user fees, such as federal excise taxes on sports fishing equipment, that accrue to the Department as federal funds. Considering only State user fees, commercial industry user fees and sport fish related user fees made up 4% and 18%, respectively, of the budget during the 1991-93 Biennium.
- Trends are towards resource non-consumptive use, such as wildlife viewing, and other general public benefits. Consumptive users cannot be expected to pay for services in which they do not primarily benefit. Department activities related to the general public are estimated to be 28% of the 1991-93 Biennium Budget and yet only 9% of the budget is from general tax revenue.
- The ratio of General Fund tax appropriations to department expenditures made to benefit the general public is about 1/3; similarly, the ratio of user fees to Department expenditures made to benefit users is about 1/3. The balance is made up mostly of revenues from federal and non-federal contracts.
- The Department's biennium budget for fish resource related responsibilities has grown by 71%, after considering inflation, between the 1977-79 Biennium and the current biennium. Most of this growth was in federal funds which grew by 110% during this same time period. Factors contributing to the budget growth include not only the increasing demands for Department activities related to non-users, but also the increased cost of management as the user fish resource revenue base is maximized. Determining equitable regulations, research and planning for fish and habitat needs, and other management requirements becomes more complex and costly as the resource becomes more scarce.
- Presently, there is no overall State policy for allocating General Fund revenue to specific activities. If there were such a State policy directive, administrative

5. For the impacts to be strictly comparable, the concept of substitution needs to be considered. There may be alternative activities that would produce the same economic impacts. For example, a commercial salmon fisherman who is kept from fishing might be employed in some alternative industry that would generate the same impact. If sport fishing opportunities were not available, a person may make purchases in another recreational pursuit that would generate a similar impact.

implementation of a cost accounting system would have to be undertaken. Depending on policy requirements, there may have to be double entry of cost codes to account for management needs and the tracking of the activities.

- There could be a wide range of alternative policies adopted to guide the setting of fees, including achieving equity between cost of services and revenues received from those that are benefiting from the services. State accounting practices do not now require the precise tracking of revenue source and use at the activity level necessary to provide the information for this equity comparison. An example of equity was analyzed for user fee revenues that support Department costs for operating hatcheries. The analysis suggests that a substantial proportion of commercial fishing industry derived user fees spent on hatchery production contributes to the recreational fisheries. Achieving any equity in the relationship between the level of user fees, fee revenues, and costs of services will require policies to be developed that address this relationship.
- The recreational participation rate as measured by per capita resident license holders has decreased from about 24% in the late 1970's to 19% in 1992. Commercial fish resource availability as measured by harvest ex-vessel value has decreased in recent years, mostly due to reductions in commercially caught salmon. Pacific whiting harvests have increased dramatically in recent years, but while it has a high volume by weight, its ex-vessel value is comparatively low; hence, landing fees received by the State for whiting are not great enough to make up for reductions in salmon related revenues. These trends make the proportion of user contributed support questionable as a financial base to sustain Department responsibilities.

The public sentiment for less reliance on general tax support of Department programs means greater emphasis will be made on user fee support. User interest groups desire better information on the costs of activities they are supporting. If there were policy directives for user fee levels to be based on cost of services or if there are restrictions on the use of General Funds, new cost accounting procedures would need to be instituted to allow for determination of Department expenditures at the activity level.

With a detailed cost accounting system, the Department would have the ability to directly relate fee levels and revenues to costs. This could offer a basis for determining what level of subsidy, if any, is appropriate. Conversely, absent a subsidy, it could ensure adequate cost recovery. The utility of such a system must consider, however, the increase in Department administrative costs for its implementation.

The outlook for natural resource management is that there will be a decline in resource availability and an increase in management costs for non-consumptive use. Traditional financing of Department activities has led to higher user fees as budget needs increase. The recent slow growth in the number of anglers and other fee paying users suggests that the Department may have reached a limit in terms of the proportion of its total budget that can be funded from user fees. New approaches for financing may need to be considered to account for the shift in Department activities towards general public benefits.

I. INTRODUCTION

A. Study Purpose

The 1991 Oregon Legislature instructed the Department of Fish and Wildlife to analyze how fees derived from commercial and sport fishing users have historically supported fishery related activities, assess the economic benefits of fishery related activities, and make findings about financing methods and program support to improve accountability and understanding of Department activities.⁶

The responsibility for completing the Study was assigned to the Oregon Coastal Zone Management Association, Newport, Oregon through an intergovernmental agreement. The OCZMA coordinated its investigation with Department personnel.

The study objectives were:

1. Determine and describe the overall composition of expenditures and revenues for the Department, especially those used to support fish related activities by Fund type. Describe how the composition may have changed since 1975-77.
2. Summarize the information on Department uses of revenues from sport and commercial fishing sources by major categories of usage.
3. Examine in more detail the specifics of how General Funds and Other Funds have been used to support activities in Fish Division programs.
4. Describe the relationship of Fish Division program expenditures to sport and commercial fishing fee revenues to the extent that these sources of revenue are separable from Other Fund revenues and General Fund revenues overall, and to the extent that expenditures are assignable to specific activities.
5. Analyze the benefits (especially impacts on state and area personal income) of Department activities. Assign benefits related to specific expenditure areas (such as Fish Division programs) to the extent such assignment is clearly justified. Discuss the difficulties inherent in the assignment of benefits for expenditures and activities which may benefit a wide range of purpose and users.

6. The Joint Committee on Ways and Means in the 66th Legislative Assembly, Subcommittee on Natural Resources and Economic Development, added the following budget note. "The Department is directed to undertake a study of the relationship of sport and commercial fees to the costs, production, and benefits of the fish programs since the merger of fish and wildlife in 1976, subject to the availability of records. The study should assess the complete costs of fishery management and other fishery-related activities. The study should be used as the basis for a new fee structure, if needed, in 1993."

B. Background

The Oregon Department of Fish and Wildlife received approximately 12% or \$15 million of its 1989-91 budget from the State's General Funds. Demands for reallocating General Funds to sustain other state agency budgets for revenues lost from Measure 5 placed requirements on the Department to interchange more of its revenues with user fees. The Department was requested to cut \$2.3 million of otherwise expected General Fund revenue for the 1991-93 biennium budget. The initiatives by the Department to raise existing fees paid by commercial fishing industry and cut back programs resulted in an unprecedented scrutiny of how fees are used to support the Department's programs. The pressure on the Fish Division was especially high since its General Fund support is much higher (therefore exposed to greater cuts) than the Wildlife Division or other programs.

The Department has typically organized revenues broadly by fund type (General Fund, Federal Fund, Other Fund) and drawn from available revenues to support Legislatively approved expenditures by fund. Certain types of revenues are earmarked for particular uses, such as most federal revenues, nongame checkoff revenues, and Restoration and Enhancement Program surcharge revenues. Angling license and tag revenues can be used to support approved Other Fund expenditures in the Fish Program with some flexibility. In addition, angling license revenue is also used to fund in part expenditures on other programs such as the Oregon State Police Fish and Wildlife Division.

Until the 1991-93 biennium, commercial fishing industry fee revenues have been passed directly to the State General Fund. The Department received a General Fund appropriation that was not formally tied to the revenues collected from commercial fishing fees. Now, 25% of commercial fisheries derived revenues will go to the Commercial Fisheries Fund (a new subcategory of Other Fund revenues) in support of programs intended to benefit the commercial industry.

Given the many different sources and uses of funds, it was difficult for the Department to explain during the short budget process these somewhat complex linkages. The Legislature asked that an analysis be prepared for the 1993 Legislative Session to show how commercial and sport fishing fees are used in relation to programs and economic benefits to the State.

C. Report Contents

The scope of the review was limited to Department activities associated with fish resources. While the Department is organized such that there is a Fish Division, other divisions have overlapping responsibilities. This required, at times, methodologies to be employed to split both revenues and costs between fish and other wildlife related resources. The methodology included an informal survey of program managers. Otherwise, study methodology used budget documents, cash receipts journals, and other special record keeping provided by the Department. The Acknowledgment Section of this report lists Department personnel that contributed to the study. Except as mentioned for very specific analysis, inflationary effects

were not considered in displaying historical budgets. Finally, while the focus of the study was not to analyze user fee or other revenue policies, discussions of revenue restrictions and program responsibilities was included.

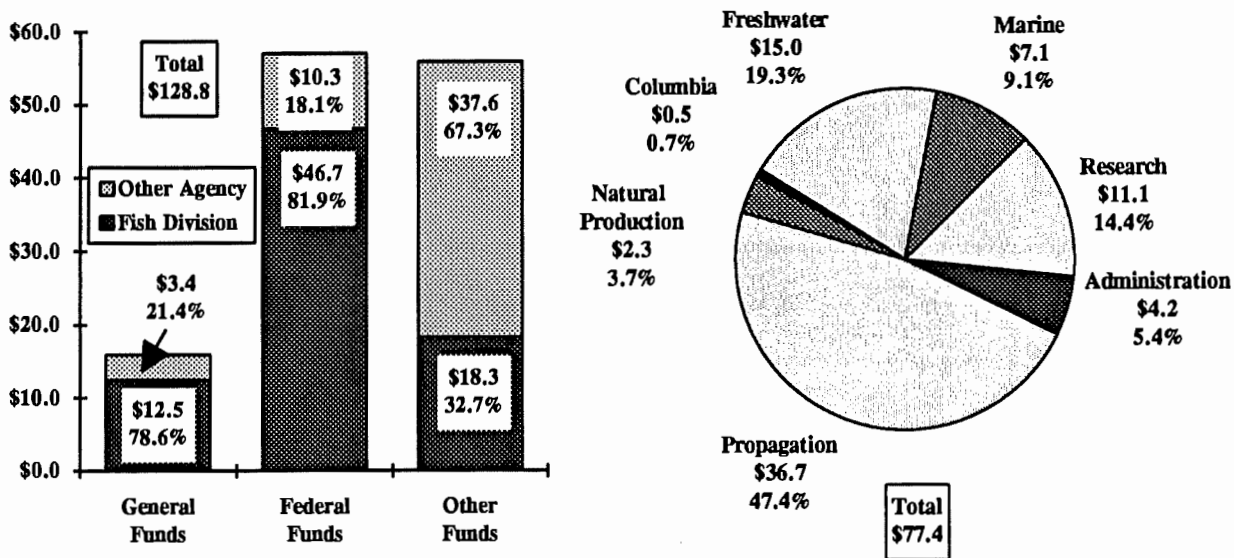
The report is organized to first explain Department programs and responsibilities related to fish resources. The revenue and cost analysis used to support the programs is then discussed. Since such a large proportion of the Department's budget is used to support hatchery facilities and research, a separate chapter was devoted to the financial analysis of fish propagation programs.⁷ The report's last chapter is a lay reader presentation about the economic benefits of fish resource management and use.

7. The Propagation Subprogram was budgeted for 47% of the Fish Division's budget during both the 1989-91 and 1991-93 biennium.

II. FISH RESOURCE PROGRAMS

The Department is comprised of four divisions and had a legislatively approved operating budget in the 1991-93 Biennium of \$128.8 million with 1,013 FTE positions. The Department's budget also contained funds for the State Police Fish and Wildlife Division, capital improvements, and capital construction. The total biennium budget is \$154.3 million. The agencywide and Fish Division operating budget for the 1991-93 Biennium is shown on Table II-1 and Figure II-1. The Fish Division represents 60.1% of the operating budgeted expenditures.

FIGURE II-1
DEPARTMENT AND FISH DIVISION 1991-93 BIENNIUM BUDGET
AGENCYWIDE FISH DIVISION



- Notes: 1. In millions of dollars.
2. Legislatively approved September 1991.
3. Excludes capital projects and Oregon State Police Fish and Wildlife Division.

Activities related to fish resources are directly associated with seven programs in the Fish Division under the current Department organization. The programs are: Fish Research and Development, Fish Propagation, Marine Resources, Freshwater Resources, Columbia River Management, Fish Administration, and Natural Production. Figure II-2 shows these programs in relation to all Department programs. The figure also shows the programs assigned full time equivalent (FTE) employees during the current biennium. Other Department divisions most closely aligned with fish resources are the Habitat Conservation Division and the Administration Division. The Oregon State Police Fish and Wildlife Division has positions assigned to fish and wildlife enforcement and has an authorized strength of 112 FTE. Lastly, from an accounting perspective, funds budgeted to facilities (Capital Improvements and Capital

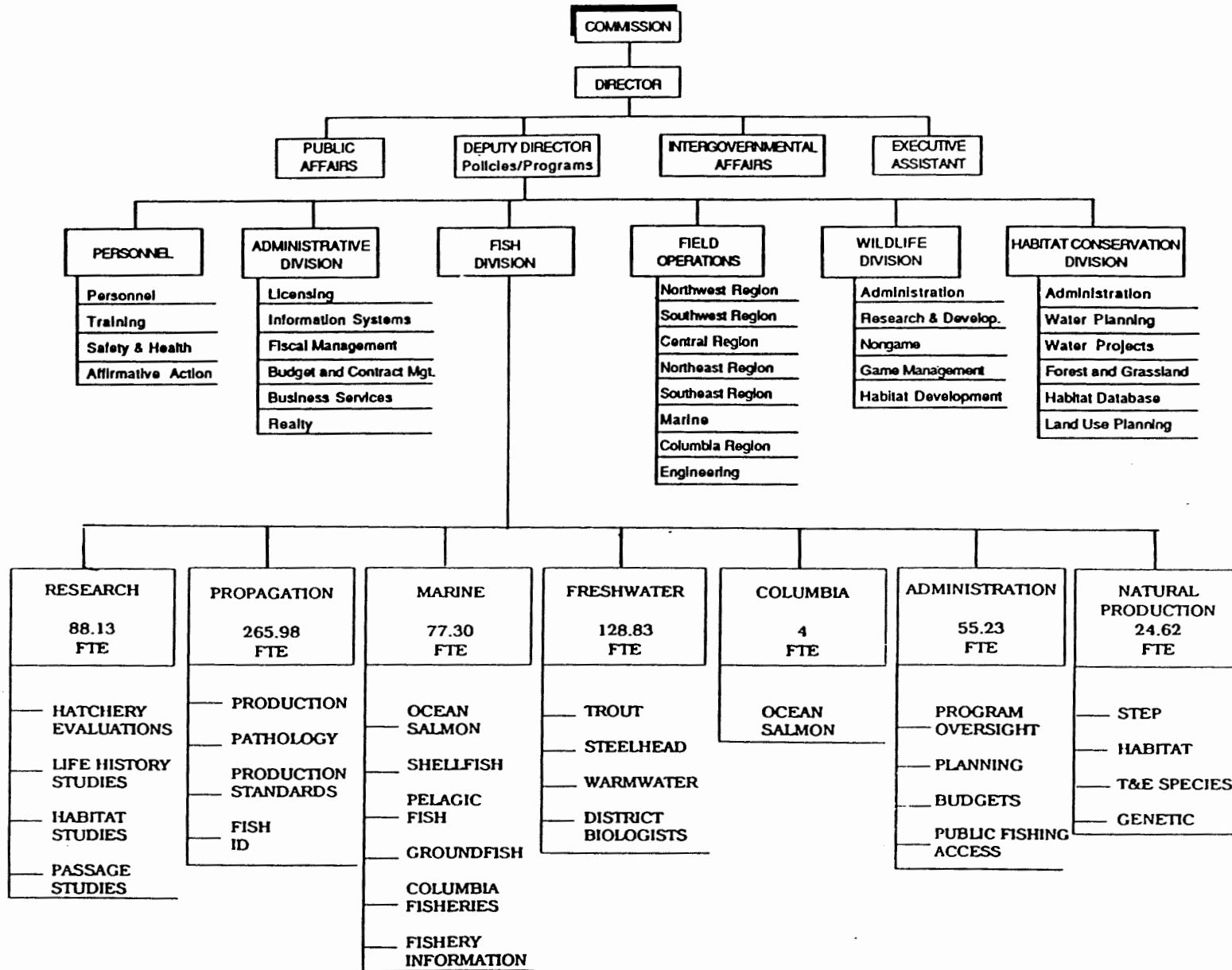
TABLE II-1
1991-93 BIENNIUM LEGISLATIVELY APPROVED BUDGET

Division	Agencywide				FTE	Percent	Fish Division				FTE	Revised Totals	
	General	Other	Federal	Total			Program	General	Other	Federal			Total
Wildlife													
PS	449	9,720	3,592	13,761			Research	PS	547	1,112	4,490	6,149	
SS	100	8,461	2,670	11,231			SS	76	179	4,458	4,713		
CO	8	1,405	240	1,653			CO	42	61	173	276		
Total	557	19,586	6,502	26,645	165	17.27%	Total	665	1,352	9,121	11,138	88	19,837
Fish							Propogation	PS	4,657	4,255	9,663	18,575	
PS	9,052	12,138	23,969	45,159			SS	2,027	3,781	10,727	16,536		
SS	2,960	5,789	21,204	29,953			CO	389	103	1,068	1,560		
CO	491	319	1,488	2,298			Total	7,073	8,139	21,458	36,671	266	37,437
Total	12,503	18,246	46,661	77,410	644	50.18%	Marine	PS	1,781	1,167	2,911	5,859	
Habitat Conservation							SS	539	142	439	1,120		
PS	423	1,293	1,413	3,129			CO	41	34	20	95		
SS	320	627	454	1,401			Total	2,361	1,343	3,370	7,074	77	7,314
CO	5	26	186	217			Freshwater	PS	821	4,004	4,298	9,123	
Total	748	1,946	2,053	4,747	37	3.08%	SS	62	1,073	4,469	5,604		
Administration							CO	1	79	164	244		
PS	1,152	11,911	382	13,445			Total	884	5,156	8,931	14,971	129	15,349
SS	913	3,818	1,321	6,052			Columbia	PS	167	111	174	452	
CO	62	387	85	534			SS	12	11	54	76		
Total	2,127	16,116	1,788	20,031	166	12.98%	CO	0	0	0	0		
Operating Budget							Total	179	122	228	528	4	546
PS	11,076	35,062	29,355	75,493			Administration	PS	773	749	1,458	2,980	
SS	4,293	18,695	25,650	48,638			SS	122	425	657	1,204		
CO	566	2,138	1,999	4,703			CO	0	9	0	9		
Total	15,935	55,895	57,004	128,834	1,013	83.51%	Total	895	1,183	2,115	4,193	55	4,315
State Police	0	14,098	0	14,098		9.14%	Natural Production	PS	305	740	975	2,020	
Non-Limited	0	655	0	655		0.42%	SS	122	179	400	701		
Cap. Improvement	0	5,627	3,256	8,882		5.76%	CO	18	34	62	114		
Cap. Construction	0	0	1,796	1,796		1.16%	Total	445	953	1,437	2,835	25	2,920
Agency Totals							Division Total	PS	9,052	12,138	23,969	45,159	
PS	11,076	35,062	29,356	75,494			SS	2,960	5,789	21,204	29,953		
SS	4,293	33,449	25,650	63,392			CO	491	319	1,488	2,298		
CO	566	7,764	7,050	15,380			Total	12,503	18,246	46,661	77,410	644	87,718
Total	15,935	76,275	62,056	154,266	1,013	100%							

Notes:

1. All figures reflect thousands of dollars.
2. Habitat Conservation Division was eliminated from the Fish Division starting in the 1991-93 Biennium.
3. Revised totals were made after printing of 1991-93 Biennium legislatively approved budget. Revisions include additions from cost of living adjustments, and other E-board approvals such as the BPA Squawfish Control Project.
4. FTE - Full time equivalent jobs; PS - Personal Services; SS- Services and Supplies; CO - Capital Outlay

FIGURE II-2
DEPARTMENT ORGANIZATION CHART



Notes: 1. 1991-93 Biennium legislatively approved budget.

Construction) are mostly related to the management of fish resources.⁸ Because only \$30,000 out of a legislatively approved \$1.8 million was estimated to be spent during the Biennium for Capital Construction, this category was not included in any analysis. Recognizing that General Funds are approximately 1/3 commercial user fees (including non-anadromous related fees such as groundfish), and Other Funds are approximately 3/5 sport user fees, the analysis suggests that a substantial proportion of General Funded hatchery production contributes to the recreational fisheries. When considering all Fish Division and other division programs, fish resource related expenditures are about 2/3 of the Department's budget and the Fish Propagation program is about 1/2 of that amount.

Figure II-3 shows the evolution of the fish resource program budgets over the last 4 bienniums. The purpose, historical budget levels, and selected example activities are described below for each of these programs.

A. Fish Research and Development Program

1. Purpose

The fisheries research and development program develops and undertakes research projects provide new knowledge and management techniques to other programs in the Fish Division. The research is designed to provide data, develop methods and recommend strategies to solve management problems for Fish Division programs including Columbia River, Freshwater Management and Fish Propagation, and to meet fisheries research, development and planning needs and conduct water development research projects for the Habitat Protection and Conservation Division. Projects are organized within four major categories of investigation: Columbia Dam passage, freshwater production, life history, and hatchery evaluation and hydro. The budgeted 1991-93 Biennium full time equivalent personnel are 88. Table II-2 shows historical budgets.

Selected example projects recently completed or underway are:

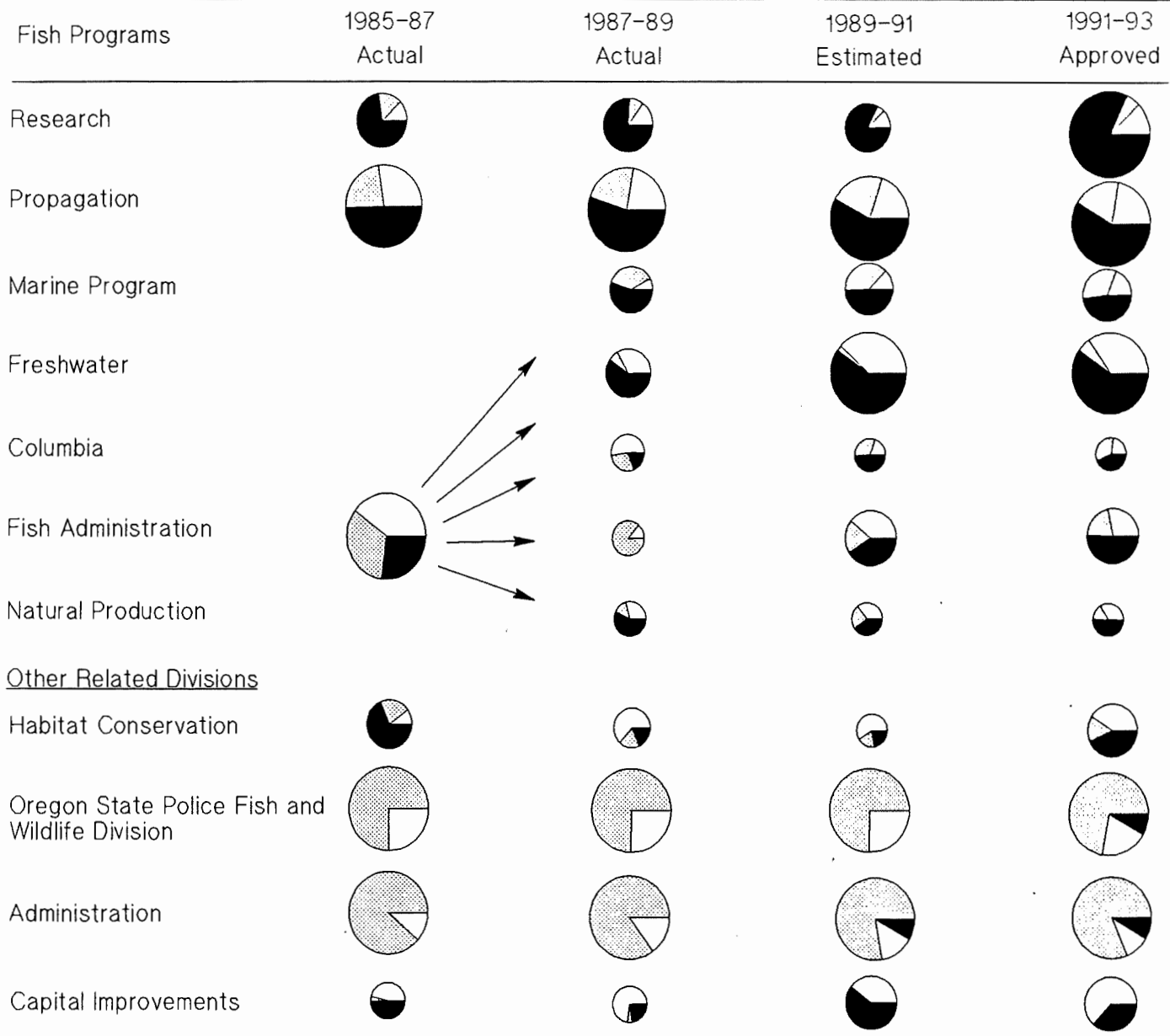
- Research plan to guide decisions on oil, gas, and placer mineral extractions
- Management plan for chinook in coastal rivers
- Yaquina Plan and Willamette subbasin plans

2. Products

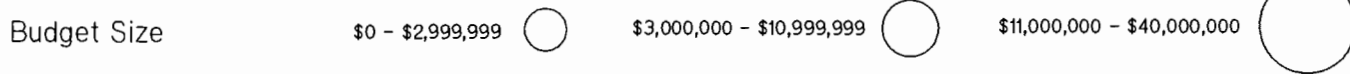
The fisheries research and development program provides research support and data availability to other fisheries programs with the ultimate goal of improving the number and quality of recreational fishing days for anglers, and increased catch for commercial fishermen.

8. Another fund budgeted for facility improvements is Capital Construction. Because only \$30,000 out of a legislatively approved \$1.8 million is estimated to be spent during the Biennium, this category was not included in any analysis.

**FIGURE II-3
HISTORICAL FISH PROGRAM BUDGETS BY REVENUE SOURCE**



Legend



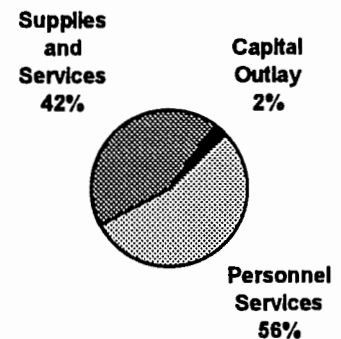
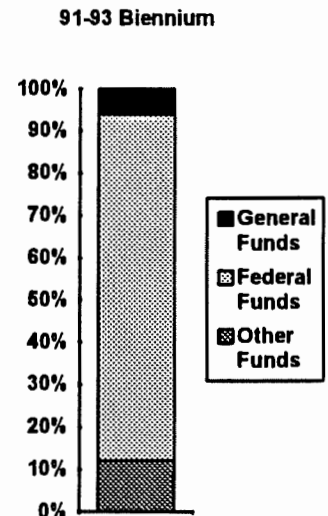
Notes: 1. No adjustment has been made for inflation.

It provides immediate and ongoing support to resource managers in the development and wise use of Oregon's fishery resources.

TABLE II-2
SELECTED HISTORICAL BUDGETS

<u>Revenues</u>	87-89	91-93
General Funds	\$578	\$665
Federal Funds	4,675	9,121
Other Funds	938	1,351
Total	\$6,191	\$11,137

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$3,646	\$6,149
Supplies and Services	2,318	4,713
Capital Outlay	227	275
Total	\$6,191	\$11,137



Notes: 1. Thousands of dollars, not adjusted for inflation.

B. Fish Propagation Program

1. Purpose

The primary purpose of the Fish Propagation program is to produce fish through artificial propagation as a way to augment natural production and replace lost wild fish runs. This program operates and administers fish hatcheries, pathology laboratories, tagging stations and other fish propagation facilities. It also undertakes fish distribution, and hatchery biological and technical services. The budgeted 1991-93 Biennium full time equivalent personnel are 266. Table II-3 shows historical budgets.

Selected example projects recently completed are:

- Brought into production, completed design or made repairs/improvements to 5 facilities
- Completed Willamette oxygen supplementation project
- Hatchery Management Information Data System completed and implemented

2. Products

This program provides additional fish for the sport and commercial harvest industries, as well as augmenting fish runs for aesthetic purposes. The 34 hatcheries under this program will produce about 190 million salmon, steelhead, trout and warmwater fish in the 1991-93 biennium. Chapter IV has a more complete discussion of hatchery operations and costs.

TABLE II-3
SELECTED HISTORICAL BUDGETS

<u>Revenues</u>	87-89	91-93
General Funds	\$6,427	\$7,074
Federal Funds	15,598	21,459
Other Funds	6,315	8,139
Total	\$28,339	\$36,671

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$14,961	\$18,575
Supplies and Services	12,245	16,536
Capital Outlay	1,133	1,560
Total	\$28,339	\$36,671

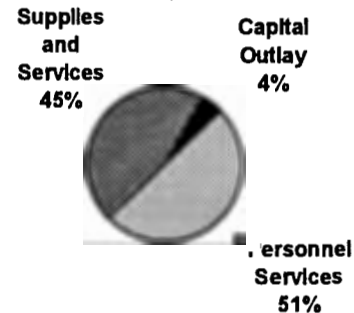
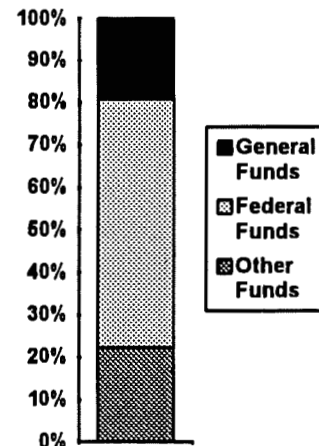
Notes: 1. Thousands of dollars, not adjusted for inflation.

C. Marine Resources Program

1. Purpose

This program carries out the Fish Division's management responsibilities for marine fish, shellfish, the Columbia River salmon fisheries, as well as management of new and evolving marine fisheries. This includes inventory, participation in regional and international management councils, the collection of biological information from commercial and sport marine fisheries, and protection of marine and estuarine habitat. It closely monitors recreational marine fisheries, assesses the harvest of commercial marine fisheries, and recommends management regulations. The budgeted 1991-93 Biennium full time equivalent personnel are 77. Table II-4 shows historical budgets.

91-93 Biennium



2. Products

This program serves as a guardian of Oregon's marine resources. Through monitoring, assessment and management of those resources, this program provides for wise use of the resource to support the sport and commercial fisheries industries, as well as providing a fishery resource of aesthetic value to Oregon residents.

TABLE II-4
SELECTED HISTORICAL BUDGETS

<u>Revenues</u>	87-89	91-93
General Funds	\$2,016	\$2,361
Federal Funds	2,951	3,370
Other Funds	414	1,342
Total	\$5,381	\$7,073

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$4,368	\$5,859
Supplies and Services	820	1,120
Capital Outlay	193	95
Total	\$5,381	\$7,073

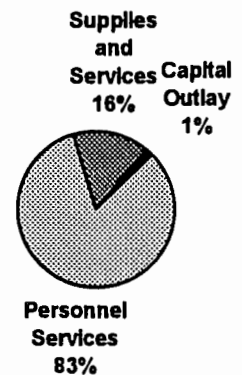
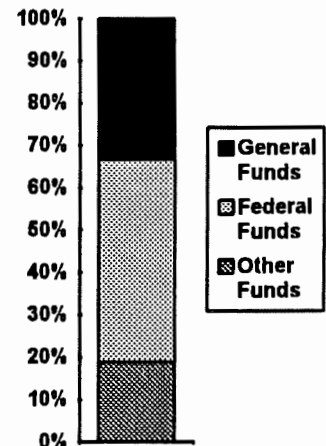
- Notes: 1. Thousands of dollars, not adjusted for inflation.
2. Prior to the 1987-89 biennium, this program was part of the Fish Administration Program.

D. Freshwater Resources Program

1. Purpose

This program directs statewide management of trout, warmwater fishes, and steelhead, and the production of salmon in freshwater habitat. The staff inventories freshwater fish populations, regulates and assesses freshwater fisheries, develops and administers freshwater fish regulations, and develops freshwater fish management plans. The budgeted 1991-93 Biennium full time equivalent personnel are 129. Table II-5 shows historical budgets.

91-93 Biennium



Selected example projects recently completed or underway are:

- Trout - identification of "wild" populations
- Warmwater fishes - investigation of interaction of salmonids and bass
- Steelhead - marking of all hatchery fish
- Salmon - production program leader position created

2. Products

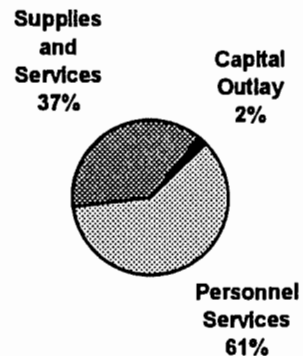
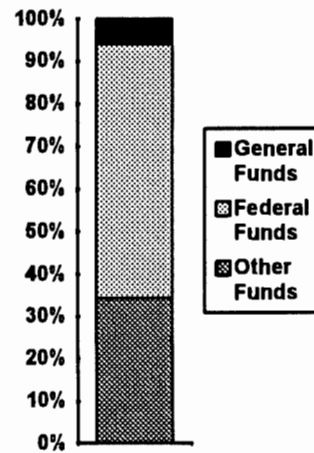
This program serves as a guardian of Oregon's freshwater fish resources. Through monitoring, assessment and management of those resources, this program provides for wise use of the resource to support the sport and commercial fisheries industries, as well as providing a fishery resource of aesthetic value to Oregon residents.

**TABLE II-5
SELECTED HISTORICAL BUDGETS**

<u>Revenues</u>	87-89	91-93
General Funds	\$632	\$883
Federal Funds	5,147	8,932
Other Funds	2,898	5,156
Total	\$8,677	\$14,971

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$5,468	\$9,124
Supplies and Services	2,680	5,604
Capital Outlay	529	244
Total	\$8,677	\$14,971

91-93 Biennium



- Notes: 1. Thousands of dollars, not adjusted for inflation.
 2. Prior to the 1987-89 biennium, this program was part of the Fish Administration Program.

E. Columbia River Management Program

1. Purpose

This program coordinates all Fish Division activities in the Columbia Basin. The staff provides inter- and intra-agency coordination for planning, implementing, and evaluating anadromous fish protection, mitigation for damages to stocks and habitat, and enhancement programs on the Columbia. A major responsibility of the staff of this program is securing funding for fisheries enhancement programs in the Columbia Basin, usually through contract negotiations with federal sources. The budgeted 1991-93 Biennium full time equivalent personnel are 4. Table II-6 shows historical budgets.

Selected example projects recently completed or underway are:

- Developed Columbia River Integrated Systems Plan
- Secured federal funds for enhancement projects
- Reached agreement for new Umatilla hatchery

2. Products

This program monitors and safeguards fisheries in the Columbia Basin, a major salmon production area, and works to enhance salmon production there. It also provides coordination for the several management entities present in the area, and makes sure these entities pay their share for fishery enhancement in the area. During the 1989-91 biennium, the staff of this program secured federally-funded contracts totaling \$3.6 million for fish passage and enhancement projects on 98 miles of streams in central and northeast Oregon.

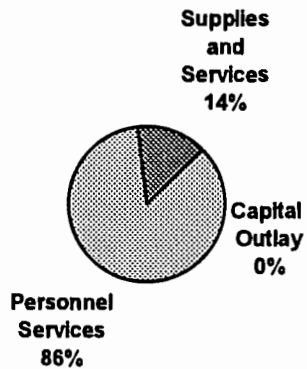
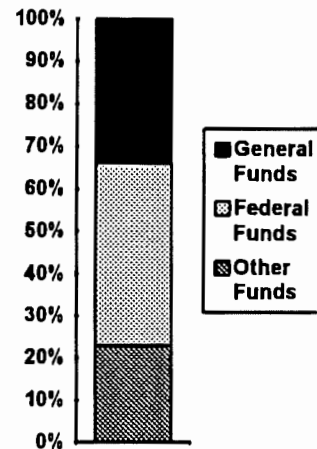
**TABLE II-6
SELECTED HISTORICAL BUDGETS**

<u>Revenues</u>	87-89	91-93
General Funds	\$698	\$179
Federal Funds	454	227
Other Funds	1,265	122
	-----	-----
Total	\$2,417	\$528

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$1,313	\$452
Supplies and Services	734	76
Capital Outlay	369	0
	-----	-----
Total	\$2,417	\$528

Notes: 1. Thousands of dollars, not adjusted for inflation.
 2. Prior to the 1987-89 biennium, this program was part of the Fish Administration Program.

91-93 Biennium



F. Fish Administration Program

1. Purpose

The primary purpose of this program is to provide the overall leadership, planning, management, and administrative support of the Fish Division, as well as being a liaison to the public and other governmental agencies. Support provided includes clerical, budget, contract, and general administrative functions. The Fish Administrative Decision Unit also includes the resources for maintenance and repair of angler and boating access sites and the printing and distribution of angling and commercial fishing regulations. The budgeted 1991-93 Biennium full time equivalent personnel are 55. Table II-7 shows historical budgets.

2. Products

This program provides the support and leadership which allows the entire fish division to function smoothly and efficiently for the purposes of safeguarding Oregon's fishery resources.

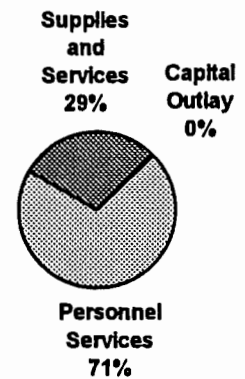
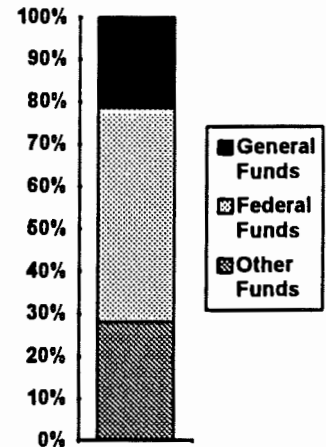
**TABLE II-7
SELECTED HISTORICAL BUDGETS**

<u>Revenues</u>	87-89	91-93
General Funds	\$643	\$895
Federal Funds	0	2,114
Other Funds	100	1,183
	-----	-----
Total	\$743	\$4,193

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$4	\$2,980
Supplies and Services	639	1,204
Capital Outlay	100	9
	-----	-----
Total	\$743	\$4,193

Notes: 1. Thousands of dollars, not adjusted for inflation.
 2. Prior to the 1987-89 biennium, the Fish Administration Program contained the functions of what are now the Marine, Freshwater, Columbia, and Natural Production programs.

91-93 Biennium



G. Natural Production Program

1. Purpose

It is the purpose of the Natural Production program to provide coordination and technical support for the natural production of Oregon's freshwater and anadromous fish. The overall objectives are to advocate the importance of natural production; implement the Wild Fish Management Policy; provide technical support for fish habitat, genetics and biometrics; foster natural fish production education and training; and provide general coordination of natural production issues. The budgeted 1991-93 Biennium full time equivalent personnel are 25. Table II-8 shows historical budgets.

Selected example projects recently completed or underway are:

- Coordinated solicitation and review of proposals for implementation of the Restoration and Enhancement program
- Review and guidance of basin plans
- Oversight and direction to statewide fish habitat program

2. Products

This program provides coordination and support which enhances the management of the natural production of Oregon's fishery resources.

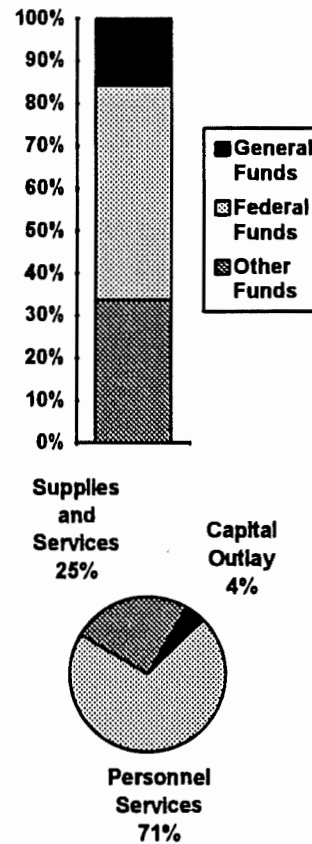
TABLE II-8
SELECTED HISTORICAL BUDGETS

<u>Revenues</u>	87-89	91-93
General Funds	\$339	\$446
Federal Funds	1,430	1,438
Other Funds	738	953
Total	\$2,507	\$2,836

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$1,902	\$2,021
Supplies and Services	465	701
Capital Outlay	140	115
Total	\$2,507	\$2,836

- Notes: 1. Thousands of dollars, not adjusted for inflation.
 2. Prior to the 1987-89 biennium, this program was part of the Fish Administration Program.

91-93 Biennium



H. Habitat Conservation Division

1. Purpose

The Habitat Conservation Division is responsible for developing and coordinating the implementation of habitat conservation programs necessary to support the resource management programs of both the Fish and Wildlife Divisions. Program development involves preparation of written policies, standards, and internal operating procedures for responding to impacts on fish and wildlife and their habitats. Program coordination involves technical and policy analysis of actual or potential habitat impact, and presentation of written comments and policy standards to resource management groups. The budgeted 1991-93 Biennium full time equivalent personnel are 37. Table II-9 shows historical budgets.

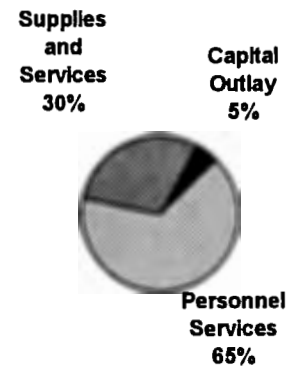
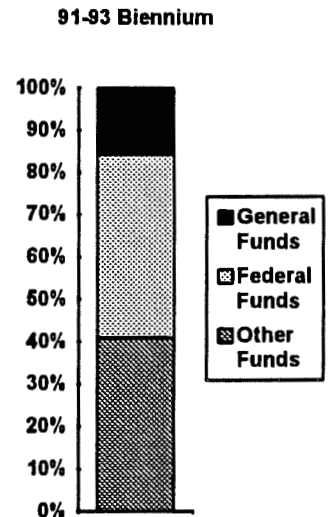
2. Products

This division provides habitat conservation which enables Oregon's fisheries resources to grow in a healthy and stable manner, and to contribute to sport and commercial fisheries industries, as well as to the aesthetic pleasure of state residents and visitors.

TABLE II-9
SELECTED HISTORICAL BUDGETS

<u>Revenues</u>	87-89	91-93
General Funds	\$255	\$748
Federal Funds	252	2,053
Other Funds	875	1,946
Total	\$1,382	\$4,747

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$1,170	\$3,128
Supplies and Services	175	1,401
Capital Outlay	37	218
Total	\$1,382	\$4,747



Notes: 1. Thousands of dollars, not adjusted for inflation.

I. Administration Division

1. Purpose

The Administration Division provides both direct services and support services in carrying out fish and wildlife programs. Services provided include leadership of the Fish and Wildlife Commission and field operations supervision, as well as such support services as personnel services, public information, and administrative services including licensing, fiscal budgeting and data processing services. The budgeted 1991-93 Biennium full time equivalent personnel are 166. Table II-10 shows historical budgets.

2. Products

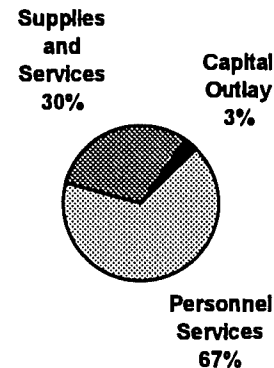
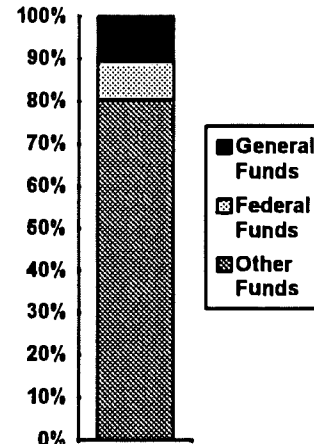
This agency provides leadership and support services which facilitate efficient management of Oregon's fisheries resources.

**TABLE II-10
SELECTED HISTORICAL BUDGETS**

<u>Revenues</u>	87-89	91-93
General Funds	\$1,989	\$2,127
Federal Funds	0	1,789
Other Funds	11,289	16,115
Total	\$13,278	\$20,031

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$8,675	\$13,445
Supplies and Services	3,759	6,052
Capital Outlay	844	534
Special Payments		0
Total	\$13,278	\$20,031

91-93 Biennium



Notes: 1. Thousands of dollars, not adjusted for inflation.

J. Oregon State Police Fish and Wildlife Division

1. Purpose

The Fish and Wildlife Division's primary responsibility is enforcement of the wildlife and commercial fishing laws. It also routinely enforces traffic, criminal, boating, livestock, land use, hazardous waste, and other laws in addition to responding to emergency situations. The budgeted 1991-93 Biennium full time equivalent personnel are 116. Table II-11 shows historical budgets.

2. Products

This agency provides protection of Oregon's fishery resources through enforcement of regulations developed by the Department.

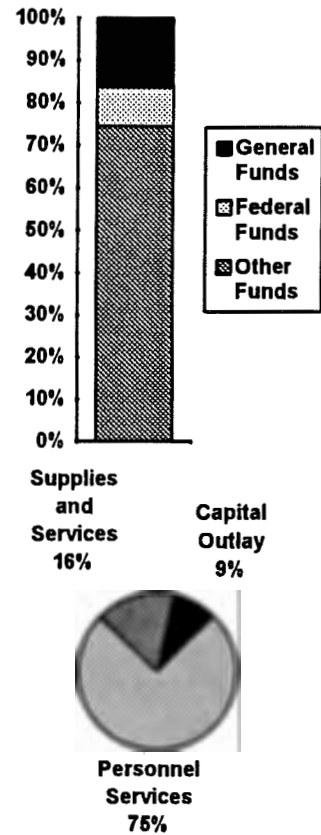
**TABLE II-11
SELECTED HISTORICAL BUDGETS**

<u>Revenues</u>	87-89	91-93
General Funds	\$3,593	\$3,383
Federal Funds	0	1,880
Other Funds	10,583	15,354
	-----	-----
Total	\$14,176	\$20,618

<u>Expenditures</u>	87-89	91-93
Personnel Services	\$11,708	\$14,814
Supplies and Services	1,906	3,185
Capital Outlay	555	1,799
	-----	-----
Total	\$14,169	\$19,798

Notes: 1. Thousands of dollars, not adjusted for inflation.
 2. Contribution of Other Funds from Department is \$14,088 thousand in the 1991-93 Biennium.

91-93 Biennium



K. Capital Improvement Account

1. Purpose

This program provides improvement and upgrades of existing fisheries propagation, enhancement and administration facilities, and construction of new facilities. Each project is approved separately by the State Legislature. During the last legislative session, the following capital improvement projects were approved for the 1991-93 biennium:

- Irrigon hatchery - additional well water capacity. \$330,000
- Wallowa hatchery - water study and development. \$220,000
- Clackamas hatchery - additional water supply. \$29,600
- Big Creek hatchery - holding/spawning facilities. \$236,000
- South Santiam hatchery - adult holding pond. \$980,000

Table II-12 shows historical budgets.

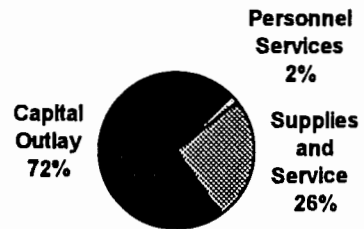
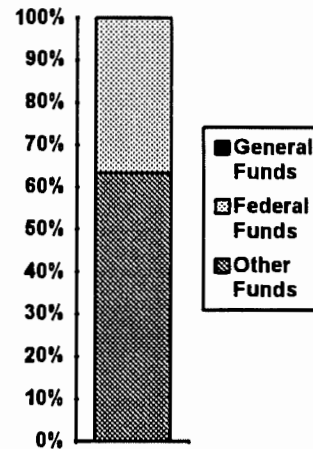
2. Products

This program allows fisheries facilities to keep up with current technology, and to maintain good repair in order to efficiently enhance Oregon's fishery resources.

TABLE II-12
SELECTED HISTORICAL BUDGETS

<u>Revenues</u>	87-89	91-93
General Funds	\$90	\$0
Federal Funds	485	3,256
Other Funds	1,536	5,627
	-----	-----
Total	\$2,110	\$8,882
<u>Expenditures</u>	87-89	91-93
Personnel Services	\$105	\$155
Supplies and Services	231	2,325
Capital Outlay	1,775	6,402
	-----	-----
Total	\$2,110	\$8,882

91-93 Bienniums



Notes: 1. Thousands of dollars, not adjusted for inflation.

III. REVENUE AND COST ANALYSIS

A previous chapter described fish program financing in terms of the summary funds of General, Federal, and Other. This chapter describes the purpose and sources of revenue that make up the summary funds, as well as other special funds, in more detail. The first section in this chapter assumes a definition of user fees in concept without actually listing the fees. Later sections in this chapter offer a definition of user fees and explains all Department fish related user costs.

A. Funds Summary

State General Funds appropriated to the Department may be spent for the general operation of the Department without restriction, however, sometimes General Funds must be used to match Federal or Other Funds awarded to the State.⁹ Federal funds generally must be spent for specific purposes or projects. The Other Funds category of revenue to the Department consists of user fees and other miscellaneous revenues. Not all miscellaneous revenue goes directly to fund Department programs. Some user fees and other revenues, such as commercial fishing industry fees, are deposited into the State General Fund, and are theoretically available for use by all State departments according to legislative appropriation. In reality, these funds have always returned to the Department.

The receipts from Department user fees and other sources of revenue are deposited into several state accounts and funds. The receiving account determines how the monies are spent. Besides the General Fund, some fish and wildlife user fees find their way into the Commercial Fisheries Fund, the Fish Endowment Account, the Wildlife Fund, the Non-game Wildlife Fund, and the Hydroelectric Fund. In some cases it is only interest received on user fees that is deposited into the various funds. The following summaries of each account will explain which monies go into the accounts, and what restrictions exist for the expenditure of those funds.

1. The State General Fund

Following is a list of user fees and other income to the Department which are deposited into the State General Fund:

- Proceeds from the sale of confiscated fish and equipment (ORS 506.690 and ORS 670.695).
- Fines (ORS 506.639).

9. For the 1989-91 Biennium, Fish Division budget, federal projects required a \$1 for \$2, non-federal for federal dollar match.

- Property disposition proceeds (ORS 506.201).
- Private salmon hatchery application fees (ORS 508.745).
- 75 percent of all monthly receipts from commercial fisheries license fees and landing fees net of Restoration and Enhancement surcharges (ORS 506.306).

Monies from the State General Fund which are appropriated to the Department are used in the programs prescribed in the budget. However, sometimes Federal funds demand matching funds from the State General Fund. Figure III-1 is a historical depiction of the Fish Division's General Fund over the last 8 bienniums. Considering adjustment for inflation, the figure shows that the most recent biennium has a general fund contribution that is approximately 30% less than the highest contribution in the 1987-89 Biennium. Most of this General Fund reduction is from general tax support. As mentioned in this report's Introduction Section, the Department was cut \$2.3 million in the 1991-93 General Fund appropriation from the 1989-91 legislatively authorized budget level.

While the figure shows legislatively approved budget levels, actual revenues received is highly dependent on fish resource availability and management of the resource. For example, in the 1991-93 Biennium, the legislatively approved budget for license and landing fees was \$4.0 million. A Department projection for this same biennium in January 1992 estimated the revenues would be \$3.5 million. The primary difference was due to salmon landing fees. The annual ex-vessel value for salmon was projected to be \$21.0 million based on 1986-1990 harvest years. The actual amount in 1992 was \$3.7 million.

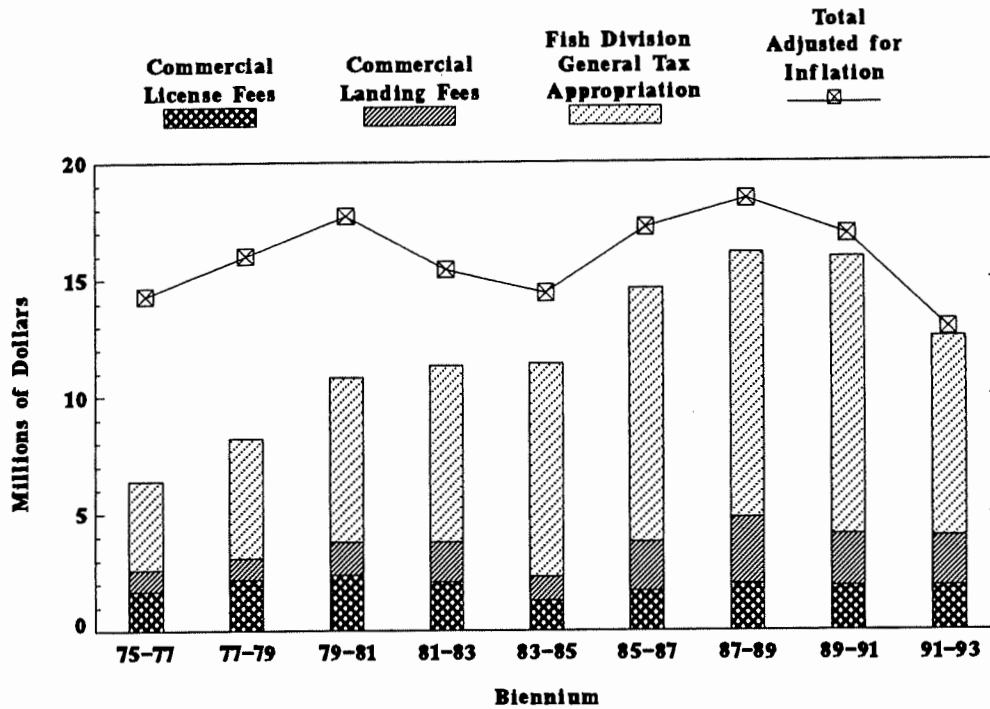
2. The Commercial Fisheries Fund

This fund receives 25 percent of all monthly receipts from commercial fisheries license fees and landing (ad valorem) fees net of Restoration and Enhancement surcharges, as well as interest income on fund balances. The monies in the fund must be spent for the administration and enforcement of the commercial fishing laws and for the management, propagation, research, habitat improvement and other activities that protect, maintain or enhance the food fish resource of this state (ORS 508.326).

3. The Fish Endowment Account

This account consists of monies appropriated by the legislature from the State Wildlife Fund, gifts, grants and donations given for the stated purposes, and 50 percent of the interest income from the State Wildlife Fund. The funds must be used to maintain state-operated fish hatcheries. Interest income from this account must be used for hatchery maintenance beginning in the 1995-97 Biennium. However, only the interest on fund balance may be used; the principal is to remain intact. (ORS 496.300.)

FIGURE III-1
FISH DIVISION GENERAL FUND



- Notes:
1. Total commercial fees are the sum of license fees and poundage fees, but do not include relatively small amounts of general fund revenues from several from several miscellaneous sources. Fees for 89-91 include some R&E surcharges.
 2. Figures represent the appropriation in the legislatively approved budget for the Fish Division or its predecessor under different Department organization.
 3. Inflation adjustment uses gross national product implicit price deflator developed by U.S. Bureau of Economic Analysis (1992 is 100).

4. The Wildlife Fund

This fund contains all monthly receipts from angling license and permit fees net of Restoration and Enhancement surcharges, and interest income. Is also contains most other fees for service charged by the Department, including 0.6211 percent of the receipts of the Criminal Fines and Assessments Account.¹⁰ Four subaccounts exist within the Wildlife Fund, namely the Fish Screening Subaccount, the Fish Screening Administration Subaccount, the Fish Restoration and Enhancement Subaccount, and the Halibut Research Subaccount. These subaccounts are described below. The monies in the general Wildlife Fund must be spent on the administration and enforcement of wildlife laws.

10. The Criminal Fines and Assessment Account receives all fines, costs, assessments, restitution, compensatory fines, and other monetary obligations not otherwise directed, imposed on persons convicted in Oregon courts (ORS 137.293). This is a state level account. The percent transferred to the Wildlife Fund is because some of these fines and penalties come from fish and wildlife users (ORS 137.300(10)).

The Fish Screening Subaccount within the State Wildlife Fund is a cost recovery account which is funded by payments to the Department for services involving making and installing fish screens. This account also contains all penalties recovered under ORS 536.900-920, violations of the terms of permits and agreements with the Water Resources Commission, as well as gifts, grants, donations, and legislative appropriations for the purposes stated here. The funds are to be used to carry out Department fish screening projects (ORS 496.300).

The Fish Screening Administration Subaccount within the State Wildlife Fund consists of all monies received from the surcharge on angling licenses imposed by section 15, chapter 858, Oregon Laws 1991. The money must be used to fund program administration costs for Department fish screening projects (ORS 496.300).

The Fish Restoration and Enhancement Subaccount within the State Wildlife Fund contains revenues from surcharges on angling licenses, surcharges on commercial salmon troll and gillnet permits, and a poundage fee of \$0.05 per pound round weight of commercial salmon landings at Oregon ports. This subaccount also contains fees from private salmon hatchery permits, and any gifts, grants, and donations given for the stated purposes. The money in this subaccount must be spent for the Department's fish restoration and enhancement programs for the benefit of the fish resources of this state. (Section 10, Chapter 512, Oregon Laws 1989.)

The Halibut Research Account within the State Wildlife Fund contains all receipts from the sale of halibut tags. The funds must be spent on halibut population studies and other halibut research (ORS 496.300).

5. The Non-game Wildlife Fund

This fund contains the receipts from the Oregon Income Tax Checkoff program, any gifts, grants or donations for the stated purposes, and interest earnings. The funds must be spent to protect and preserve non-game wildlife (including non-game fish) and their habitat (ORS 496.390).

6. The Fish and Wildlife Hydroelectric Fund

This fund contains receipts from permit and license fees to appropriate water for hydroelectric purposes which may threaten fish and wildlife habitat (ORS 496.820). It also contains application fees for such hydroelectric projects (ORS 496.825), and interest income. The money in this fund must be used by the Department in its activities related to hydroelectric projects, including payment of necessary administrative expenses (ORS 496.835). Revenues are collected by the Water Resources Department.

7. Other Funds

Specific funds may temporarily exist within the Department's accounting system to receive transfers or appropriations of funds for specific purposes. Examples of these temporary funds are the Lottery fund, which may receive appropriations from Lottery income; the Certificate of Participation (COP) Fund, which may receive income from state-issued debt notes to be used for capital projects; and the Capital Improvement Fund, which may receive legislative appropriations for specific capital improvement projects.

B. User Fee Definition

The following is a description of the user fees and other miscellaneous funds received by the Department. Generally, fees and charges for service are authorized and set in Oregon statute. Oregon statute also determines to which fund these fees and other income are deposited. Table III-1 lists four categories of user fees, in which fund they are deposited, restrictions on their use, and any statutory authorization reference. The appendix contains a listing of revenues received for these user fees in recent years.

1. Commercial Fisheries Permits, Licenses and Other Fees

Commercial fishermen and processors in Oregon are charged license fees. Some must also purchase a yearly permit for the fish species and gear they are fishing. This also includes vessel permits and licenses, as well as fish buyer and fish processor licenses. Recently, a Restoration and Enhancement (R&E) surcharge was added to some of these fees pursuant to Section 4, Chapter 512, Oregon Laws 1989. The state also charges a landing (ad valorem) fee and an R&E poundage surcharge on commercial fish species which are landed at Oregon ports. Of these fees, 75 percent (net of R&E surcharges) is paid to the State General Fund for use in supporting all of state government (including the Department), and 25 percent (net of R&E surcharges) goes into the Commercial Fisheries Fund, to be used for the benefit of commercial fish users. All R&E surcharges go into the Fish R&E subaccount within the State Wildlife fund to be used for restoration and enhancement of Oregon's fish resources. Figures III-2 through III-4 and Table III-2 are a chronology of fees paid by commercial fishermen and fish processors.

2. Sport Fisheries Permits, Licenses and Other Fees

Sport fishermen, or anglers, in Oregon must purchase licenses, permits, and sometimes stamps and tags for access to the sports fishery. An R&E surcharge was attached to all angler licenses pursuant to Section 4, Chapter 512, Oregon Laws 1989. Funds from these fees (net of R&E surcharges) are deposited to the State Wildlife Fund for the administration and enforcement of wildlife laws. Restoration and enhancement surcharge earnings go into the fish R&E subaccounts of the State Wildlife Fund. The state also charges an additional surcharge on sport licenses, which goes to pay for fish screening projects. Halibut tag receipts go into a

TABLE III-1
USER FEE RESTRICTIONS

USER FEES	FUND ¹	RESTRICTIONS	CITATION
1. COMMERCIAL FISHERIES Permits and Licenses 75 % 25 % Permits and License Surcharge Landing (Ad Valorem) Fees 75 % 25 % Landing Surcharge	GF CFF FREF GF CFF FREF	Unrestricted Commercial Fish User Benefits Fish Restoration and Enhancement Unrestricted Commercial Fish User Benefits Fish Restoration and Enhancement	ORS 506.306 ORS 508.326 Oregon Laws 1989 ORS 506.306 ORS 508.326 Oregon Laws 1989
2. SPORT FISHERIES Permits and Licenses Some Amount ² Halibut Tags Fish Screening Surcharge Permit and License Surcharge	WF Counties HRF FSS FREF	Enforcement of Wildlife Laws For Expenditure by Counties Halibut Research Fish Screening Uses Fish Restoration and Enhancement	ORS 496.300 ORS 497.022(2) ORS 496.300 ORS 496.300 Oregon Laws 1989
3. OTHER FEES Rents and Royalties Employee Housing Other Rentals Leases and Agreements Copy and Service Charges Application Fees (hatcheries) Legal Notice Mailing Fee Hydro Assessment Fees Other	WF WF WF WF WF GF WF FWHF WF	Enforcement of Wildlife Laws Enforcement of Wildlife Laws Enforcement of Wildlife Laws Enforcement of Wildlife Laws Enforcement of Wildlife Laws Unrestricted Enforcement of Wildlife Laws For ODFW Hydro Projects. Enforcement of Wildlife Laws	ORS 496.300 ORS 496.300 ORS 496.300 ORS 496.300 ORS 496.300 ORS 508.745 ORS 496.300 ORS 496.835 ORS 496.300
4. OTHER MISCELLANEOUS INCOME Non-federal Agreements Indirect Cost Charges on External Contracts (non-fed) Indirect Federal Revenue Fines and Penalties ³ Grants and Donations (non-fed) Income Tax Checkoff Interest Income - on Various Funds - on Wildlife Fund - 50 % - on Wildlife Fund - 50 % Civil Damage Settlements Carcass and Egg Sales Auction Income (sales of seized boats and gear) Sales of Seized Fish/Shellfish Sale of Property/Equipment Hatchery Sales of Pellets Sales of Sundries Sales of Publications Transfers from Other Departments/Fund	OF OF OF WF Various NGWF Various FEA NGWF OF OF GF GF GF WF WF WF Various	Used for Designated Purposes Unrestricted Unrestricted Enforcement of Wildlife Laws Depends on the Receiving Fund Preservation of Non-game Wildlife Depends on the Receiving Fund Maintain Department Hatcheries Preservation of Non-game Wildlife For Use by the Damaged Region For Hatchery Maintenance Unrestricted Unrestricted Unrestricted Enforcement of Wildlife Laws Enforcement of Wildlife Laws Enforcement of Wildlife Laws Depends on Receiving Fund	ORS 137.293-303, ORS 506,630 Various ORS 496.380-390 Various ORS 496.300 ORS 496.380-390 Federal Agreement ORS 506.670-695 ORS 506.670-695 ORS 506.201 ORS 496.300 ORS 496.300 ORS 496.300 ORS 496.300 Various

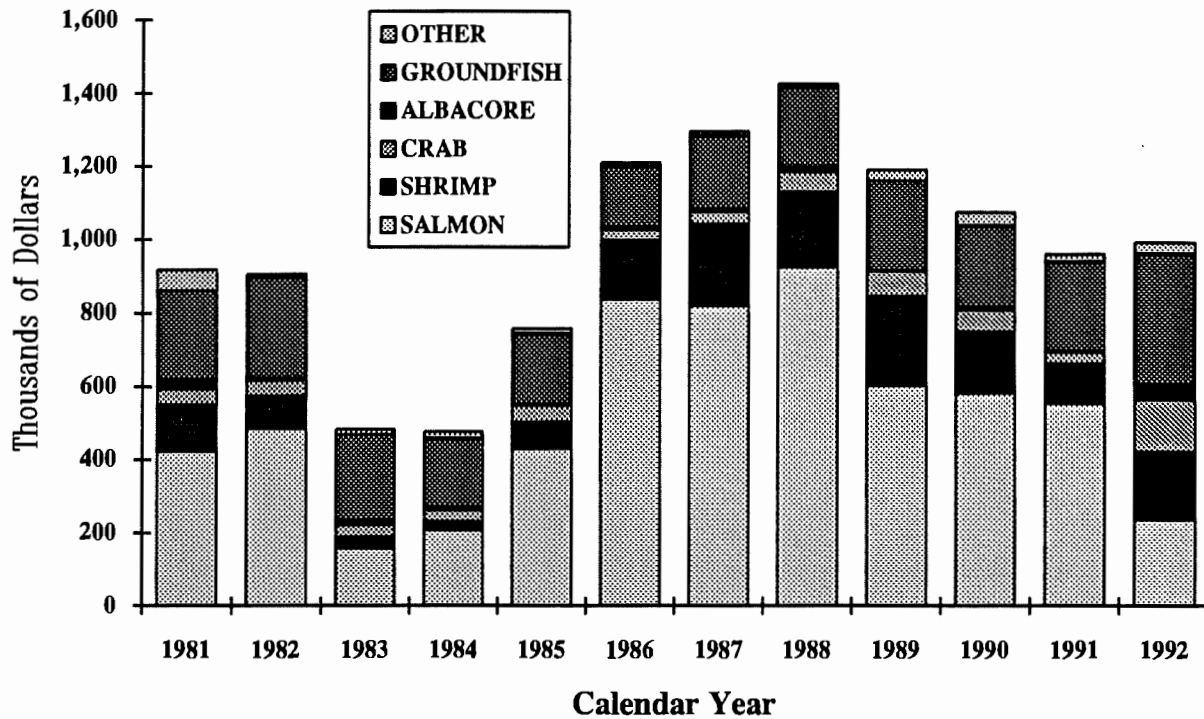
Sources: The Oregon Department of Fish and Wildlife and Oregon Revised Statutes.

Notes: 1. The funds are abbreviated as follows:

- GF - State General Fund;
- OF - Funds other than State General Funds and federal funds, including:
 - CFF - Commercial Fisheries Fund;
 - FEA - Fish Endowment Account;
 - NGWF - Non-game Wildlife Fund;
 - FWHF - Fish and Wildlife Hydroelectric Fund.
 - WF - State Wildlife Fund, including:
 - FREF - Fish Restoration and Enhancement Subaccount;
 - FSS - Fish Screening Subaccount;
 - FSAS - Fish Screening Administration Subaccount; and
 - HRF - Halibut Research Subaccount.

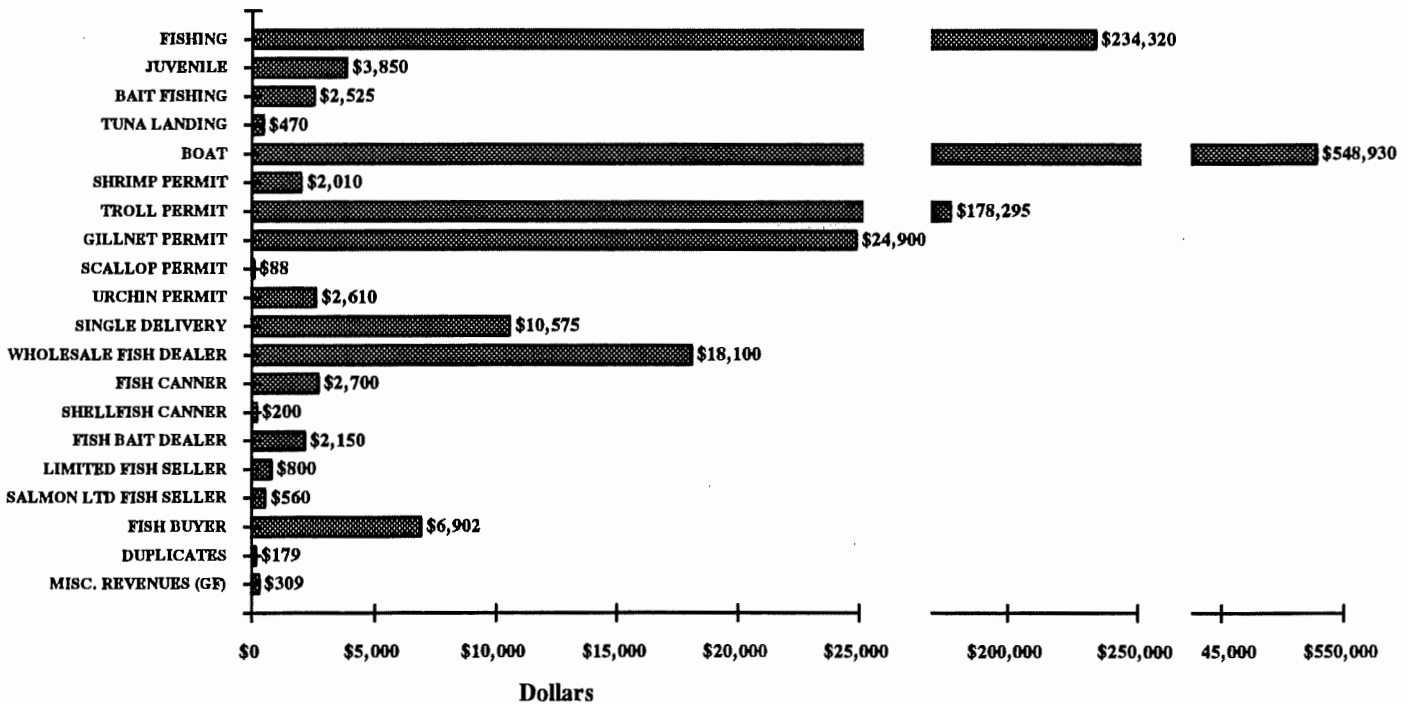
- 2. If user fees for angling tags and permits are collected by county employees, \$0.50 on each charge will go into that county's general fund
- 3. Fines and penalties from most fish and wildlife law violations are initially directed into the Criminal Fine and Assessment Account with the State General Fund, along with all other state-collected fines and penalties. Later, 0.6211 percent of the Criminal Fine and Assessment Account is transferred to the State Wildlife Fund.

FIGURE III-2
COMMERCIAL FISHING LANDING FEES



Note: 1. Fees include the \$0.05 per pound R&E surcharge for salmon for 1990 and later.

FIGURE III-3
COMMERCIAL FISHING LICENSE AND PERMIT REVENUE IN 1991



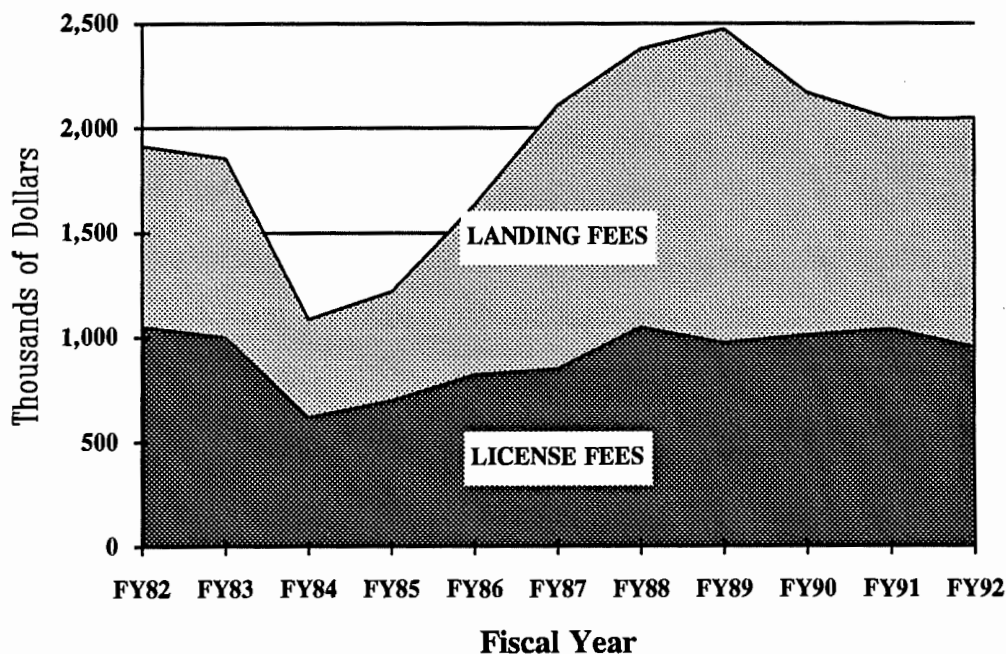
Notes: 1. The R&E Surcharge Fund received \$179,090 and the General Fund received \$861,074 in 1991.

TABLE III-2
CHRONOLOGY OF LANDING FEE CHANGES 1927-PRESENT (CENTS PER POUND)

	1927	1935	1937	1943	1945	1947	1949	1959	1964	1971	1972	1974	1980	1990	1992
Salmon & Steelhead (Except Chum)	0.5						0.75		1.1	1.6	1.8		5	10	see note 2/
Chum	0.5	0.125					0.1875		0.4				0.6		
Sturgeon	0.5						0.75		0.8						
Shad	0.125						0.1875		0.3						
Smelt	0.5		0.1		0.2		0.3								
Albacore	0.5	0.025		0.15			0.25						0.35		
Halibut	0.5	0.025					0.0375		0.2			0.3	0.5		
Other Fish	0.5	0.025					0.0375		0.05			0.1	0.3		
Crabs	0.05						0.2	0.3	0.4				0.6		
Clams	0.05	0.1					0.2	0.3	0.4				0.6		
Shrimp	0.05						0.75	0.1	0.2			0.3	0.5		see note 2/
Pacific Whiting													0		2/

- Notes: 1. The last increase in poundage fees was effective in 1980, except for the 5 cent per pound surcharge on salmon implemented in 1990 to help fund the Restoration and Enhancement Program. The surcharge is authorized through 1997.
2. In 1992 the landings fees were changed to ad valorem fees of 3.15% on salmon and 1.09% on all other species.

FIGURE III-4
COMMERCIAL FISHING LANDING AND LICENSE FEES



- Notes: 1. Fees for FY90 and later include R&E surcharge revenues.
2. Landing fees for January 1992 and later are based on landings and value data reported on fish tickets and not actual dealer remittances. Actual dealer landings fee remittances are very close to the estimates based on fish ticket pounds and values.
3. Actual fee amounts prior to FY82 are not available. In 1980, the increase in landing fees resulted in an increase in revenues. Declining landings and prices in 1984 and 1985 resulted in revenue decreases.

special subaccount which must be spent on halibut research. An historical accounting of sport fishing licenses and tags are shown on Table III-3 and Figures III-5 and III-6.

3. Other User Fees

The Department also charges user fees for other services, such as rental of housing to hatchery employees, and administrative service charges. An exception is hydroelectric assessment fees collected by the Water Resources Department for the use of water. These receipts go into the Fish and Wildlife Hydroelectric Fund for use in the Department's hydroelectric projects. Hatchery application fees go into the State General Fund (ORS 508.745).

4. Other Miscellaneous Income

This category includes all other revenues to the Department excluding user fees, State General Fund contributions, and Federal contributions. The Department may have agreements with non-federal parties such as municipal and other state governments or utilities such as mitigation funding for damage to fish runs or habitat, or joint enhancement projects. Indirect revenue may be earned by the Department on federal or non-federal contracts. A large portion of the fines and penalties charged for violation of state fish and wildlife laws is deposited in the State Wildlife Fund. Non-federal grants, gifts and donations may be offered, usually for specific uses, to the Department. An Oregon income tax checkoff program provides a vehicle for the public to donate to the Non-game Wildlife Fund, which preserves and protects non-game species and habitat. Interest income is earned on various fish and wildlife funds, and generally remains in the respective fund. Civil damages may be awarded, usually in the case of pollution. These awards generally go to the Department region in which the pollution occurred. The final category of miscellaneous income is that of sales of goods or property. Fish hatcheries may sell fish eggs, fish carcasses or pellets. The Department may sell equipment, property or resources on property which they own. They may also sell boats, gear or fish which have been seized after a violation of Department regulations. Funds may also be transferred to the Department from other departments or funds.

C. Sources and Uses of Fish Resource Related User Fees and Other Revenues

Previous sections have discussed the purpose of individual funds and sources of revenue contributing to the funds. This section is to show how fish resource derived revenue contributes to fish resource activities. Table III-4 and Figure III-7 show the fish resource derived sources and uses of funds within the Other Fund, General Fund, and Federal Fund categories for the 1991-93 Biennium. Appendix D has a detailed listing of revenue budgets for each of the funds. The figure shows that \$36.1 million of fish resource derived Other Funds are used to support \$18.3 million of Fish Division activities. The balance goes to related divisions' expenditures support. The figure shows that commercial licenses and landing fees contribute \$4.0 million to the State's General Fund. However, this amount plus an additional \$8.5 million is returned for Department use. The figure also shows that \$57.0 million is budgeted for federal funds, of which \$10.3 million is used by other divisions for participation

TABLE III-3
CHRONOLOGY OF SPORT FISHING FEE CHANGES 1915 - PRESENT

License/Tag	1915	1918	1921	1935	1939	1941	1948	1950	1956	1960	1968	1972	1976	1982	1983	1986	1988	1990	1992
Resident Combination	2.00	3.00	5.00					7.00			9.00	10.00	15.00	18.00			19.00	21.00	24.25
Resident Angler	1.00	1.50	3.00					4.00			6.00		9.00	12.00				14.00	14.25
Nonresident Angler				3.00	5.00		10.00	15.00	10.00		15.00	20.00	25.00	30.00				35.00	35.25
Ten Day Angler				1.00	2.00	3.00	5.00				7.00	10.00		18.00				20.50	20.75
Daily Angler								1.00			1.50	2.50		3.00	3.50			4.50	4.75
Salmon-Steelhead Tag									1.00				2.00	5.00					
Salmon-Steelhead Stamp																5.00			
Sturgeon Tag																5.00			
Halibut Tag																			5.00

- Notes:
1. Fees do not include license agent issuance charge. Some combination license fee increases reflect increases in the hunting license fee.
 2. The 1990 increases were surcharges dedicated to the Fish Restoration and Enhancement Program.
 3. The 1992 increases were the \$0.25 surcharge for screening irrigation diversions.
 4. Ten Day Angler was formerly called the Vacation Angler license, sometimes effective for less than ten days.
 5. Daily Angler originally instituted for salmon only in 1956; in 1960 for all species.
 6. Salmon-Steelhead Tag originally called the Salmon Angler License; became the Salmon-Steelhead Tag in 1974. Tag includes only first 10 fish starting in 1986.
 7. For Salmon-Steelhead Stamp, additional 10 fish stamp required starting in 1986.

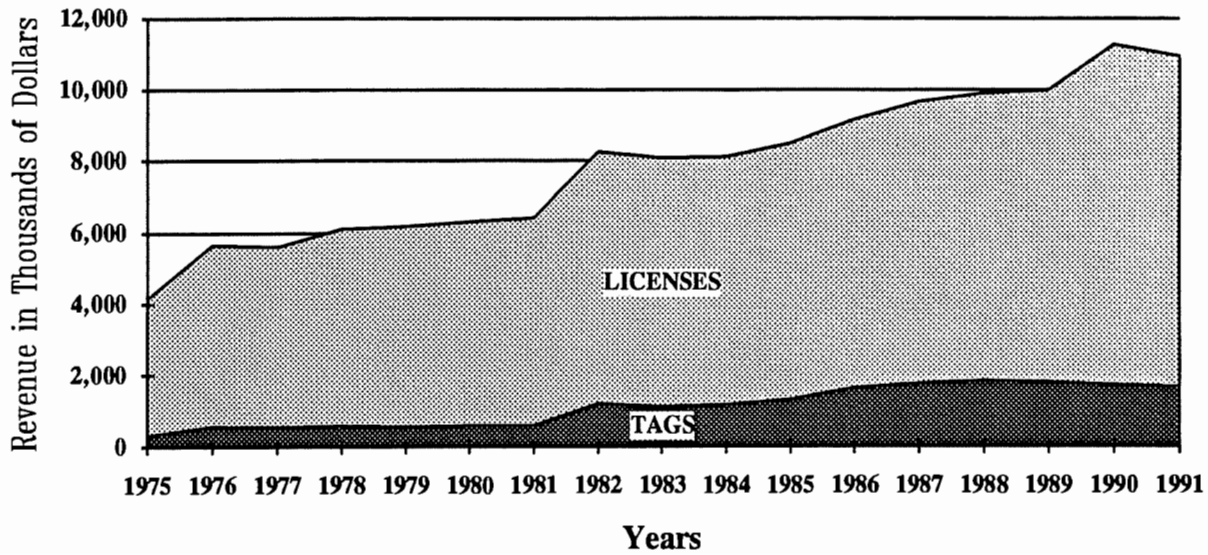
in grant administration and management. Approved budgets for the General Fund specify how much is to be used in each division, so no carry over between divisions is shown. An arrow on the left side of the Other Related Division shaded box shows additional Wildlife Fund, General Fund, and non-fish resource related Federal Funds support for these divisions.

D. Relationship of Fish Resource Related User Fee Revenue and Activity Costs

The term user fee can refer to everything from park admissions fees to property taxes used to finance public education.¹¹ Taxes, on the other hand, are generally considered assessments

11. Muskin (1972) makes a broad interpretation of the term user fee that encompasses any funds raised for a specific purpose. The American Oxford Dictionary defines the term fee as "a sum payable to an official or a professional person for advice or services; a sum payable for membership to a society, use of a laboratory or other facility, etc.", and the term charge as "the price asked for goods or services." In their statistical series on governments, the U.S. Census Bureau narrowly defines "fees and charges" as amounts received from the public for the performance of specific services benefiting the person charged and from the sale of commodities.

**FIGURE III-5
SPORT FISHING LICENSE AND TAG REVENUE**



Notes: 1. Revenue not adjusted for inflation.

**FIGURE III-6
SPORT FISHING LICENSE AND TAG REVENUE IN 1991
With Number Sold and Fee Amounts**

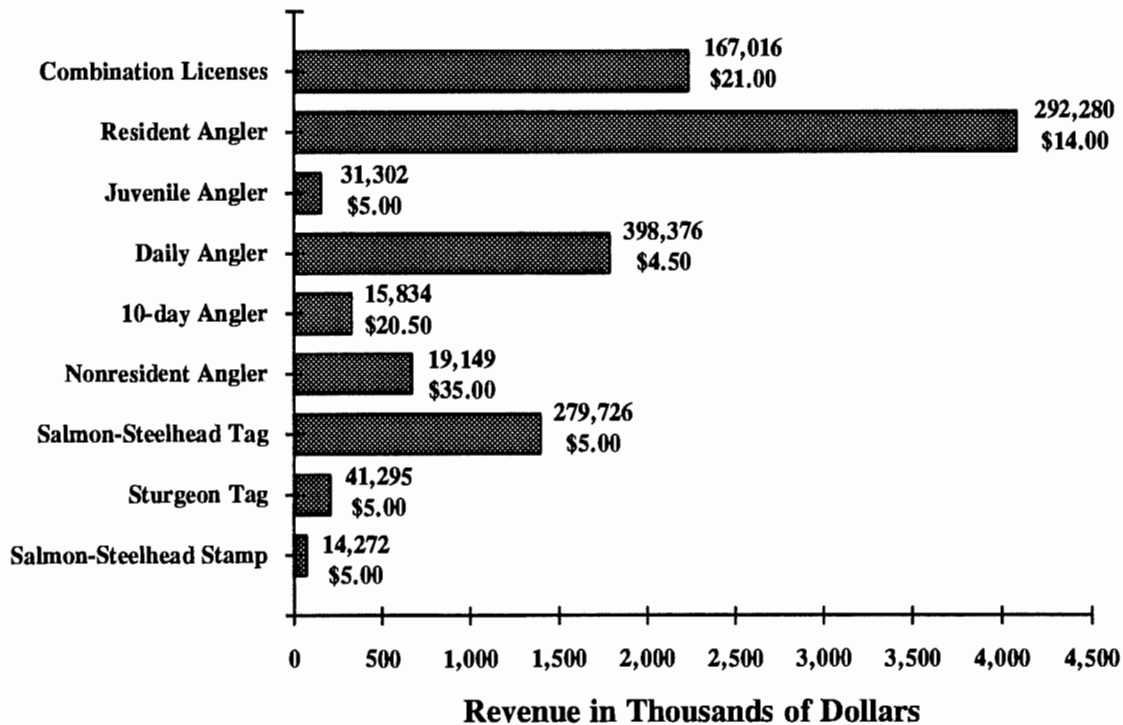
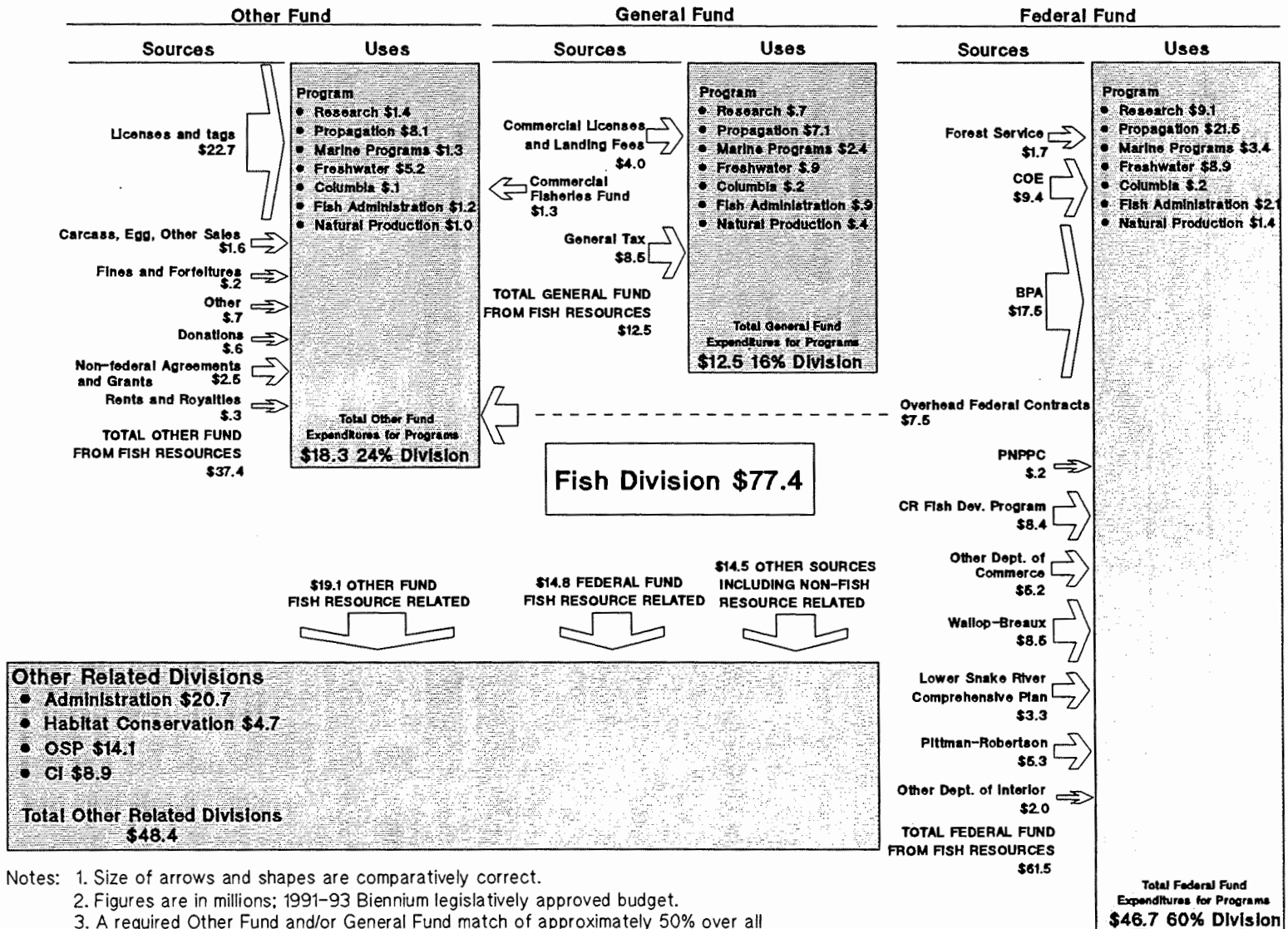


FIGURE III-7
REVENUE SOURCES FOR FISH RESOURCE RELATED PROGRAMS BUDGETED IN THE 1991-93 BIENNIUM



- Notes:
1. Size of arrows and shapes are comparatively correct.
 2. Figures are in millions; 1991-93 Biennium legislatively approved budget.
 3. A required Other Fund and/or General Fund match of approximately 50% over all federal funds is necessary for activities financed with federal funds.
 4. Other source revenue for the related divisions are Wildlife Fund, General Fund, and non-fish resource related Federal Funds.
 5. Capital Construction program not included.

TABLE III-4
SOURCES AND USES OF FUNDS FOR FISH RESOURCE RELATED PROGRAMS
BUDGETED FOR THE 1991-93 BIENNIUM

<u>Source</u>	Use			<u>Other Related Divisions</u>	<u>Total</u>
	<u>Other Fund</u>	<u>General Fund</u>	<u>Federal Fund</u>		
Other Fund	10.8		7.5	17.8	36.1
General Fund		12.5		0.0	12.5
Federal Fund			46.7	7.3	54.0
	-----	-----	-----	-----	-----
Total	10.8	12.5	54.2	25.1	102.6
Other Sources				23.3	23.3
				-----	-----
Total				48.4	125.9

- Notes: 1. Figures in millions of dollars.
2. Other sources for fish resource related divisions include the Wildlife Fund, General Fund, and non-fish resource related Federal Funds.

levied to the public as a whole for services benefiting the public as a whole. Fees are charged by the Department to commercial and sport fishermen. Since there is restricted access to nearly all fisheries, i.e. one must possess a license for the opportunity to participate in fishing, fishing user benefits do not directly accrue to the general public. Those who pay the permit and license fees receive the direct benefits of access to the fishery, which includes the services of fishery management, enhancement and research. There are, however, many activities in which the Department participates, including user management, that benefit the general public in the form of economic development and environmental enjoyment. Thus, both user fees and taxes are justified to pay for these services. A partial list of activities includes:

- recreational boating facility construction
- education about environmental conservation practices
- provide fish research
- assist others in water resources and water quality planning
- develop recovery plans for fish and wildlife species and assist in developing management plans for timber and other resources
- develop general guidelines for habitat protection
- evaluate habitat and resource use plans developed by others
- maintain habitat inventory system

The questions of the level and when user fees should be charged, and how they can be dedicated to certain purposes has fueled an entire field of economic research. It is generally agreed that user fees should be related to either the value of the benefits received by the user, or to the costs to produce those benefits. Two general pricing methods have been developed. The first consists of determining the actual value (or percentage of value) to the recipient

(fisherman). When considering the value of benefits received, it has also been stated that those who receive less benefits should pay less. Although the direct economic value received by each fisherman will vary, it would be difficult to find those individual values and charge each fisherman accordingly. However, commercial fishermen who harvest different species or the same species with different gear types, as a group generally receive differing values of benefits, and should be charged differently. Chapter V in this report discusses several approaches for measuring the value of benefits received.

The second method of pricing public services involves determining the cost (or percentage of cost) of providing the service, and dividing that by the number of recipients of the service. When considering the costs of services delivered, it should be taken into account that sport and commercial species may have different costs of enhancement and management. Greater reluctance to pay user fees will result if there is a perceived divergence between those persons who pay and those persons who are direct recipients of the service.

The development of a pricing system for the variety of goods and services which the public section provides is a challenging task for both policy makers and administrators (Texas Advisory Commission on Intergovernmental Relations 1981). Public officials cannot expect fishermen to fully pay for the costs of services when the general public also receives some of the benefits. Rather than simply setting prices which will recover all costs of production plus a profit for all goods and services produced, public officials must first determine which products will be priced and what types and percentages of production costs will be recovered.

The State does not prescribe an accounting system for tracking expenditures for benefit categories. The objectives for the study required estimates of this information. An informal survey of program managers was used to determine the allocation of costs to commercial fish management, sport fish management, habitat protection, information/education, and fish resource related administration. The last three categories can be considered benefits accruing to the general public. Table III-5 shows the results of the survey.

In order to assign fish-related costs as accurately as possible to activity categories, it was necessary in most cases to use the actual budget allocation figures as opposed to what was in the original 91-93 Legislatively Approved Budget for the Department. These actuals did not differ by significant amounts for most programs. However, the research and development program actuals were substantially higher than the original 91-93 budget document figures, because of the E-Board approved federally funded squawfish control project. Table III-6 describes the methodology used to spread expected program and program costs by activity.

Figure III-8 shows a comparison of budgeted expenditures for users and the general public to budget revenues from General Funds, Federal Funds, and Other Funds. The figure shows that 72.1% of the Department's fish resource related budget benefits users and that 22.3% is raised from State user fees.

This does not account for certain federal funds being user fee derived, such as Wallop-Breaux monies being collected from excise taxes on sports fishing equipment. The derivation of user

TABLE III-5
BUDGET EXPENDITURES BY ACTIVITY FOR 1991-93 BIENNIUM

Program	Commercial Fish	Sport Fish	Habitat Protection	Adminis- tration	Information and Education	Total
Freshwater						
Regions	\$0.26	\$2.71	\$8.49	\$1.22	\$0.92	\$13.58
Natural Production	0.00	0.00	1.39	0.15	0.00	1.54
FW Management	0.28	0.28	0.84	0.19	0.00	1.60
Subtotal	0.54	2.99	10.72	1.56	0.92	16.72
Columbia	0.00	0.00	0.44	0.00	0.00	0.44
Research and Development	8.08	9.33	1.00	0.57	0.00	18.97
Marine Resources	3.16	2.73	0.59	0.90	0.00	7.38
Fish Administration	0.00	0.00	0.00	2.24	0.00	2.24
Propagation	12.50	18.74	0.00	5.43	0.00	36.67
Capital Improvement Program						
Hatchery Repairs	1.86	1.19	0.00	0.00	0.00	3.06
Restoration and Enhancement	0.77	3.75	0.00	0.11	0.00	4.63
Subtotal	2.63	4.94	0.00	0.11	0.00	7.68
Habitat Conservation Division	0.90	0.90	1.62	0.00	0.18	3.59
Totals For Fish Division and HCD	27.80	39.63	14.37	10.81	1.10	93.70
Department Administration	3.39	4.83	1.75	1.32	1.12	12.41
Oregon State Police Fish and Wildlife Division	1.07	5.43	0.00	1.33	0.00	7.82
Grand Totals	\$32.26	\$49.89	\$16.12	\$13.46	\$2.22	\$113.94
Percentages by Activity	28.3%	43.8%	14.1%	11.8%	1.9%	100.0%
Grand Total Exclusive of Federal Funds	\$13.15	\$25.52	\$8.03	\$8.17	\$1.53	\$56.40
Percentage by Activity	23.3%	45.3%	14.2%	14.5%	2.7%	

- Notes: 1. Figures reflect millions of dollars.
 2. Expenditures are biennium estimates, February 1993. Habitat conservation, Department Administration, and State Police Fish and Wildlife Division estimates are only fish resource related budget expenditures.

TABLE III-6
METHODOLOGY FOR SPREADING FISH RESOURCE COSTS BY ACTIVITY

Freshwater

One hundred percent of Natural Production, except STEP, was assigned to habitat. Sixty percent of STEP was assigned to habitat, the remaining 40% was split 50%/50% between the sport fish and commercial fish categories.

Columbia

One hundred percent was assigned to habitat protection. The Columbia River fisheries management is not included here, but instead is part of the Marine Resources program.

Research and Development

A crude approximation of \$1 million dollars to benefit habitat protection was made. Based on administrative costs for this estimate, an additional allocation was made for administration.

Marine Resource (MRP)

Administration category costs includes 100% of MRP administration plus 10% of dollars remaining after deducting MRP administration and habitat from total dollars. Habitat category expenditures include all of the marine habitat program, 3% of Columbia River management, and for shellfish, the personal services cost for a Biologist 3 position at top range.

Fish Administration

The limitation assigned to Realty (\$1.1 million) was not included under any activity. The remainder was assigned to the administration activity.

Fish Propagation

The administration category includes salaries and Supplies and Services for:

- Portland administrative staff
- Fish Health Monitoring program
- Technical Services Program (fish marking, tag recovery, evaluation)
- Hatchery Coordinators for: NW, NE and Columbia Regions

The sport fish/commercial fish assignment was split 60%/40% after administration was subtracted. This split is based on total salmon catch. If based on Oregon catch only, the split would be 62%/38%.

Capital Improvement

Hatchery repairs used the Columbia River sport fish /commercial fish split (39%,61%). The difference between Columbia River hatcheries and all fish propagation is the difference in harvest CWT recoveries. The Restoration and Enhancement Program dollars shown were not all available for use.

TABLE III-6
METHODOLOGY FOR SPREADING FISH RESOURCE COSTS BY ACTIVITY (CONT.)

Habitat Conservation Division

Costs were assigned 50% to the two fisheries activity categories; the remaining 50% was split 45% to the habitat protection category and 5% to the information and education category.

Department Administration Program

Overall department administration costs (with the exception of the information and education category) were prorated among all the activities based on the totals over all the categories listed above, in contrast to the Fish Management program. The concept is that overall Department administration with its large fiscal management component is "chargeable" to those activities it serves on the basis of cost shares.

Oregon State Police

Seventeen percent of the budget (including some general fund allocation for commercial fisheries enforcement) was assigned to the administration category. Fifty percent of the fish and wildlife enforcement budget was assigned to the sport fish category. One hundred percent of the commercial fish enforcement budget was assigned to the commercial fish activity category.

fee supported Federal Funds was beyond the scope of work for this study. However, the accounting of Federal Funds for sport fish and commercial fish related could be calculated as an expenditure function based on the above described methodology.

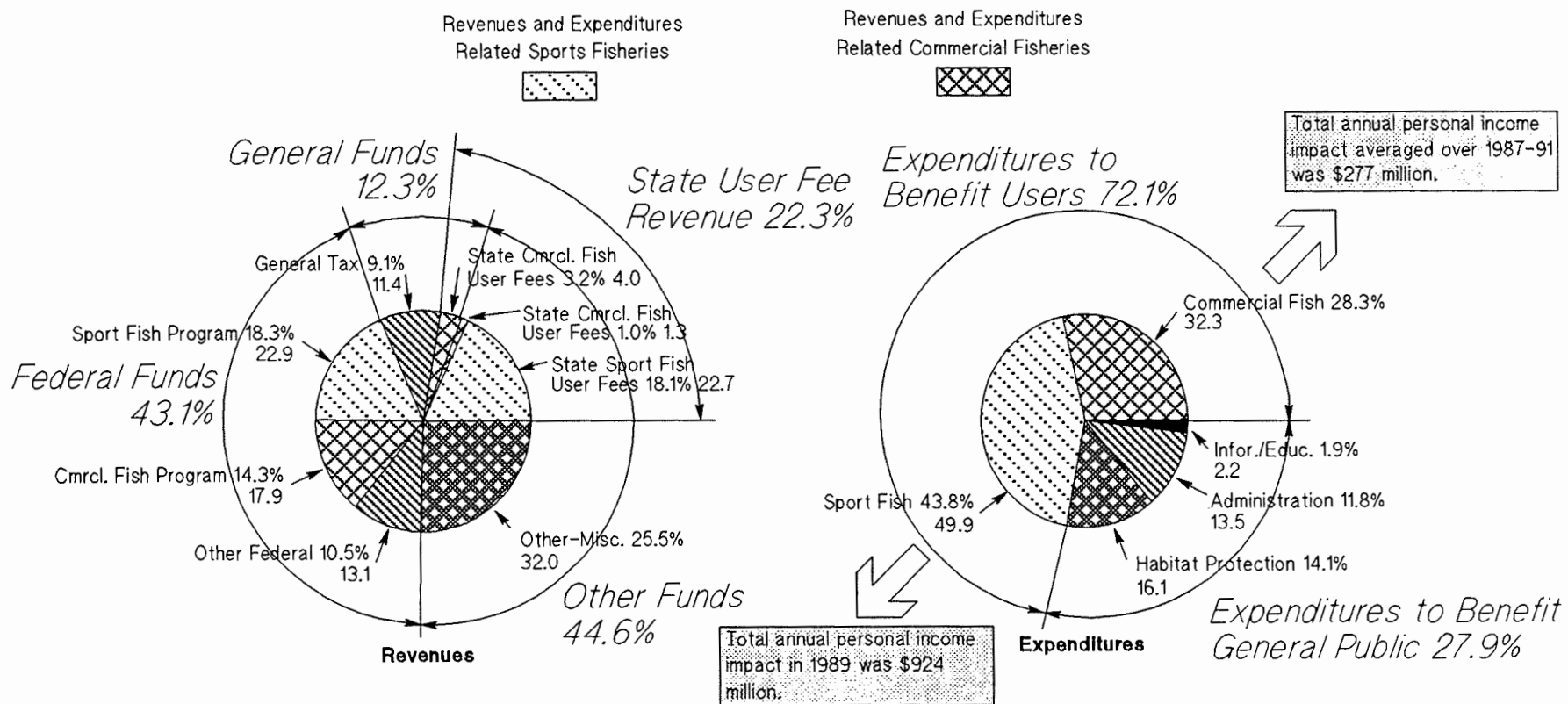
Figure III-8 also shows that 28.3% of Department fish resource related expenditures are for commercial fish users and 18.5% is from commercial fish related revenues. For sports fishing, 43.8% are expended and 36.4% are raised. The balance for both user categories is made up mostly of federal and non-federal contracts.

A third picture that emerges from the figure are the expenditures that benefit the general public through habitat protections, information/education activities, and administration of programs. The amount of the Department's fish resource related budgeted for this category is 27.9%. State general tax support for the budget is 9.1%. This does not count federal funds being derived from general taxation.

E. Outlook for Fish Resource User Benefit and General Public Benefit Cost Recovery

The value of commercial fishery harvests in Oregon as compared to other states does not allow the same flexibility in user fee pricing strategies. Table III-7 shows the ex-vessel value of harvests in selected coastal states. Ex-vessel values for Washington reflect the landings of the large factory trawler fleet which operates primarily off of Alaska.

**FIGURE III-8
FISH RESOURCE REVENUES, EXPENDITURES, AND BENEFITS**



- Notes:
1. Biennium budgets in millions of dollars.
 2. Revenues are legislatively approved budget September 1991.
 3. Expenditures are biennium estimates February 1993. Administration and OSP estimates are only fish resource related budgeted expenditures.
 4. Some federal funds are derived from user fees, such as Wallop-Breaux grant monies being collected from excise taxes on sports fishing equipment.
 5. State user fees are defined to be licenses, tags, and landing fees.

TABLE III-7
SELECTED COASTAL STATES ESTIMATED STATE EXPENDITURES
FOR MANAGEMENT AND EX-VESSEL VALUE

State	Estimated Expenditures for Fisheries Management	Ex-vessel Value of Commercially Caught Fish	Percentage of Ex- vessel Value Spent on Management
Alaska - FY 88	54.2	1,462.1	4%
- FY 89	57.0	874.2	7%
California - FY 88	62.0	201.0	31%
- FY 89	67.0	180.8	37%
Washington - FY 87	31.7	177.0	18%
- FY 88	32.0	185.0	17%
Oregon - FY 89	37.0	77.5	48%
- FY 93	32.3	73.9	44%
Florida - FY 88	34.4	201.6	17%
- FY 89	46.0	180.4	26%

- Notes:
1. Millions of dollars.
 2. Some states were unable to estimate expenditures for "commercial" management from expenditures for "sport" management. California and Oregon estimates are for "commercial" management costs only.
 3. Ex-vessel values of fish are for calendar years 1987, 1988, 1989, and 1992.

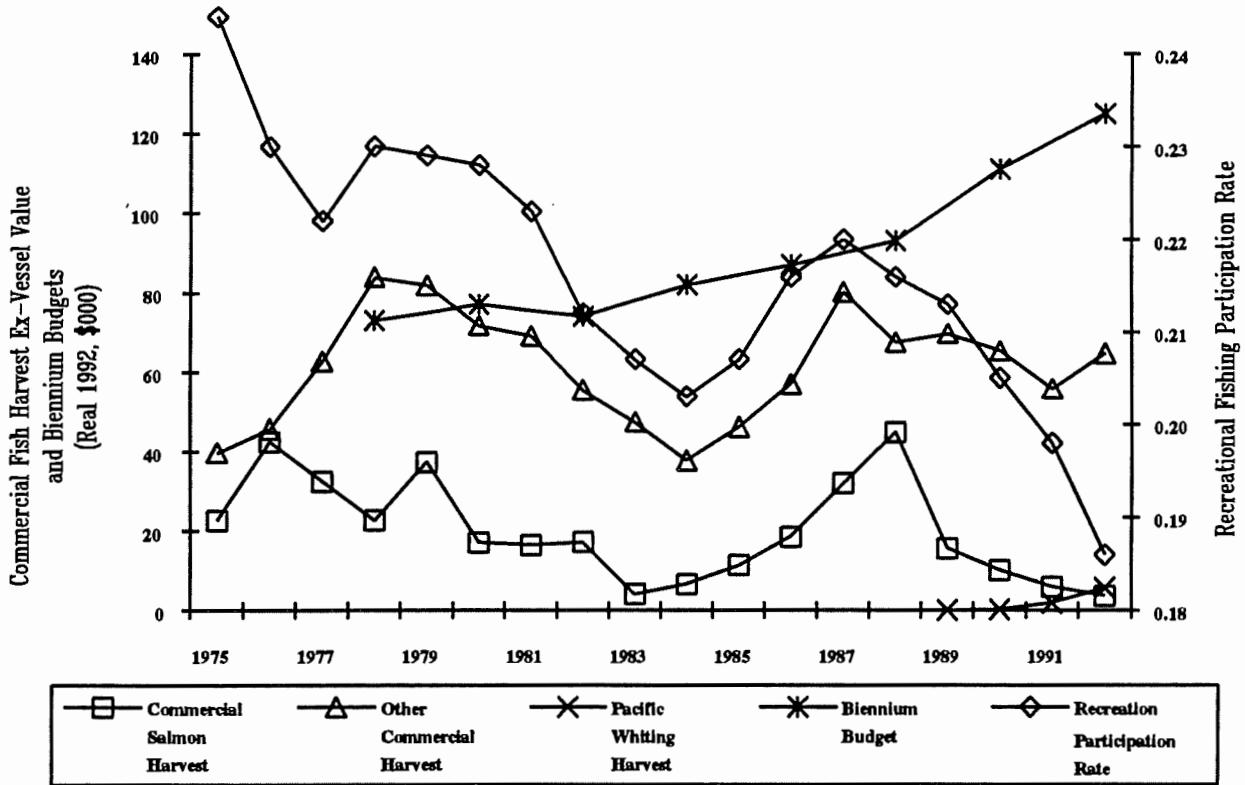
Source: Maria Gladziszewski. Commercial Fisheries Expenditures in Alaska and Selected Coastal States. Alaska Legislative Research Agency, May 1991 for fiscal years prior to 1990. Study estimates for fiscal years 1991-93 in Oregon.

California law requires that expenditures for fish and wildlife management be paid for by revenues generated from users of the resource. Because of this law, the California Department of Fish and Game tracks expenditures for commercial fishing management. Pricing strategies for Department activities in Oregon similar to California would result in extremely high landing fees as compared to other states. This would affect the marketing competitiveness of fish sold from Oregon nationally and internationally, because the increased costs of fees would have to be passed on to wholesale and retail prices requested by the consumer.

Previous sections in the report have shown that fish resource user contributed support for management costs has been a significant portion of the Department's budget. Recent trends in resource availability and recreational user participation rates appear to make this portion questionable as a growing financial base to sustain the Department activities. Figure III-9 shows the recreational participation rate of resident angling licenses holders, various commercial harvest ex-vessel values, and the Department's fish resource related budget.

The Oregon statewide participation rate (licenses holders divided by population) has decreased from about 24% in the late 1970's to 19% in 1992. Contributing factors are loss of access and opportunity, competition for users time and money, and an aging population (Sport Fishing Institute 1990). Gilstrom (1988) found that population shifts from rural to urban areas and

FIGURE III-9
 COMMERCIAL FISHING RESOURCE VALUE AND
 RECREATIONAL FISHING PARTICIPATION RATE



- Notes: 1. Harvest values are adjusted for inflation using the gross national product implicit price deflator developed by the U.S. Bureau of Economic Analysis (1992=100).
 2. The Department's biennium budget is for fish related programs only. The budget amounts are also adjusted for inflation.

population density are good predictors of participation rate. Highly urbanized states like California have lower fishing participation rates than Oregon. In contrast to consumptive participation, the U.S. Fish and Wildlife Service (1992) reports that 479 thousand Oregon residents participated in 5.3 million non-consumptive, primary activity days in the State during 1991.¹²

The commercial fishing harvests ex-vessel values are for salmon, Pacific whiting, and all other. Salmon (all species, including ocean and Columbia River gillnet) has historically averaged around 1/4 of total resource ex-vessel value, but the value has decreased by 92% between 1988 and 1992. The value of other harvests (groundfish, shrimp, crab, tuna, etc.) has

¹². Non-consumptive, primary, non-residential activity is defined as trips or outings of at least one mile from home for the purpose of observing, photographing, or feeding wildlife. Trips to zoos, circuses, aquariums, and museums are not included. The U.S. Fish and Wildlife Service surveys recreation activity every five years, but earlier series information is not compatible with 1991 survey data.

remained fairly stable; however, there has been a general reduction since 1987. Higher than average landings of shrimp and crab has occurred in 1992, which buoyed the overall value. Cyclic abundances for these species will probably result in a decrease in harvests in the near term. The landings of Pacific whiting, which has a comparatively low price per pound compared to groundfish, appears to be the only positive trend in resource availability.¹³ There may be other underutilized species in emerging markets that will add to overall commercial fish resource availability. The recent trends suggest, however, that Department revenue based on the user base may have reached its limit on the proportion of total management costs that can be recovered.

The Department's biennium budget for fish resource related responsibilities has grown by 71%, after considering inflation, between the 1977-79 Biennium and the current biennium. Most of this growth was in federal funds which grew by 110% during this same time period. Factors contributing to the budget growth include not only the increasing demands for Department activities related to non-users, but also the increased cost of management as the user fisheries resource base is maximized (Huppert 1987). Determining equitable regulations, research and planning for fish and habitat needs, enforcement and monitoring, and other management requirements becomes more complex as the resource becomes more scarce. With new federal initiatives to reduce expenditures, added pressures will be applied on general tax and user fees to deliver fish resource conservation and use management.

A recent planning effort by the Department recommended a long-range plan be developed that would achieve objectives for habitat management, biodiversity, and private landowner participation (Potter 1992). It was agreed by participants in the effort that present funding is not adequate for the Department's current programs as well as expanded mission the public desires.

Many sources of additional revenue were discussed during the planning process:

- a larger share of the State General Fund
- an income tax increase tied to a reappointment of the General Fund for natural resources
- a sales tax with a portion dedicated to sustaining fish and wildlife habitat
- increased fish and wildlife user fees
- expanding user fees to include diverse wildlife-related recreation
- excise tax on hunting and fishing gear or wildlife viewing equipment
- parking fees at wildlife viewing sites
- habitat improvement bond issue tied to a recycling tax
- statewide nonprofit fish and wildlife foundation to receive public and foundation donations

13. Recent management decisions by the Pacific Fishery Management Council has set aside a certain share of the Pacific whiting harvest abundance for onshore processing. The balance is taken by floating offshore processors. Only the onshore landings contribute landing fees despite Department management and research costs related to the entire harvest.

- Bonneville Power Administration trust fund designated for fish and wildlife habitat
- Sikes Act funding whereby fees are collected for a variety of uses on public lands, then returned to the state for habitat activities
- fee hunting or other incentives to retain habitat on private property with a percentage returned to the Department for habitat programs
- a coordinated volunteer program for a variety of Department activities

A statewide survey used as input to the process found that, as the Department's goals have become more general in nature and benefit Oregonians as a whole, funding for these programs should become more and more the obligation of the State General Fund. The survey results indicated people are willing to pay increased income taxes to sustain, restore, and enhance Oregon's fish and wildlife populations and habitat.

IV. FISH PROPAGATION FINANCIAL ANALYSIS

This chapter examines Department services within the Fish Propagation program area. The examination includes a review of hatchery characteristics, hatchery production, and catch of anadromous fish of hatchery origin. This was necessary in order to identify who benefits from these services. Revenues and costs are then compared to determine if there is at least proportional equity between those that pay for the services and those that receive benefits from the services.

A. Hatchery Fish Production

Hatcheries produce both resident fish, such as trout, and anadromous fish species, such as salmon. They also play an important role in fish research and development. The Department's hatchery program is developed to act in concert with natural production goals as required by the Wild Fish Management Policy (OAR 635-07-525 to 529) and the Game Resources Conservation Policy (OAR 635-07-535). These policies and two Department comprehensive plans (Comprehensive Plan for Production and Management of Oregon's Anadromous Salmon and Trout [June 1982] and the Statewide Trout Management Plan [November 1987]) provide the framework for managing individual fish species and addressing the role for hatcheries in achieving and maintaining optimum fish populations.

There are 51 public hatchery facilities in the Columbia Basin (Washington 24, Oregon 17, and Idaho 10), 12 on the Oregon coast, and 5 in interior Oregon. Permits have been issued for release of salmon by private operators at 12 sites, but only one of the permittees is active today. Figure IV-1 shows the location of these hatcheries operated by the Department in Oregon and Figure IV-2 depicts hatchery production by regions in 1990. Appendix D lists the production characteristics and budgets for all hatcheries in Oregon.

In addition to Department and privately owned hatcheries, the Salmon and Trout Enhancement Program (STEP) started in 1981 also augments natural production through artificial production of salmon and trout. This is a volunteer program allowing private citizens to participate in a variety of Department fish management activities. Artificial production and the other activities are authorized and supervised by Department staff. The STEP program is an important contributor to the Department propagation program.

Anadromous fish production areas in Oregon encompass approximately 50 river and lake systems in the coastal sector and tributaries flowing into the Columbia River. These systems support important natural populations of coho (*Oncorhynchus kisutch*), chinook (*O. tshawytscha*), and chum (*O. keta*) salmon, and steelhead (*Salmo gairdneri*) and cutthroat (*S. clarki*) trout. There are three major anadromous fish production areas in Oregon: upper Columbia (upstream of Bonneville Dam), lower Columbia (downstream of Bonneville Dam) including the Willamette River Basin, and coastal. Coho and chinook salmon and steelhead

ODFW Fish Rearing Facilities

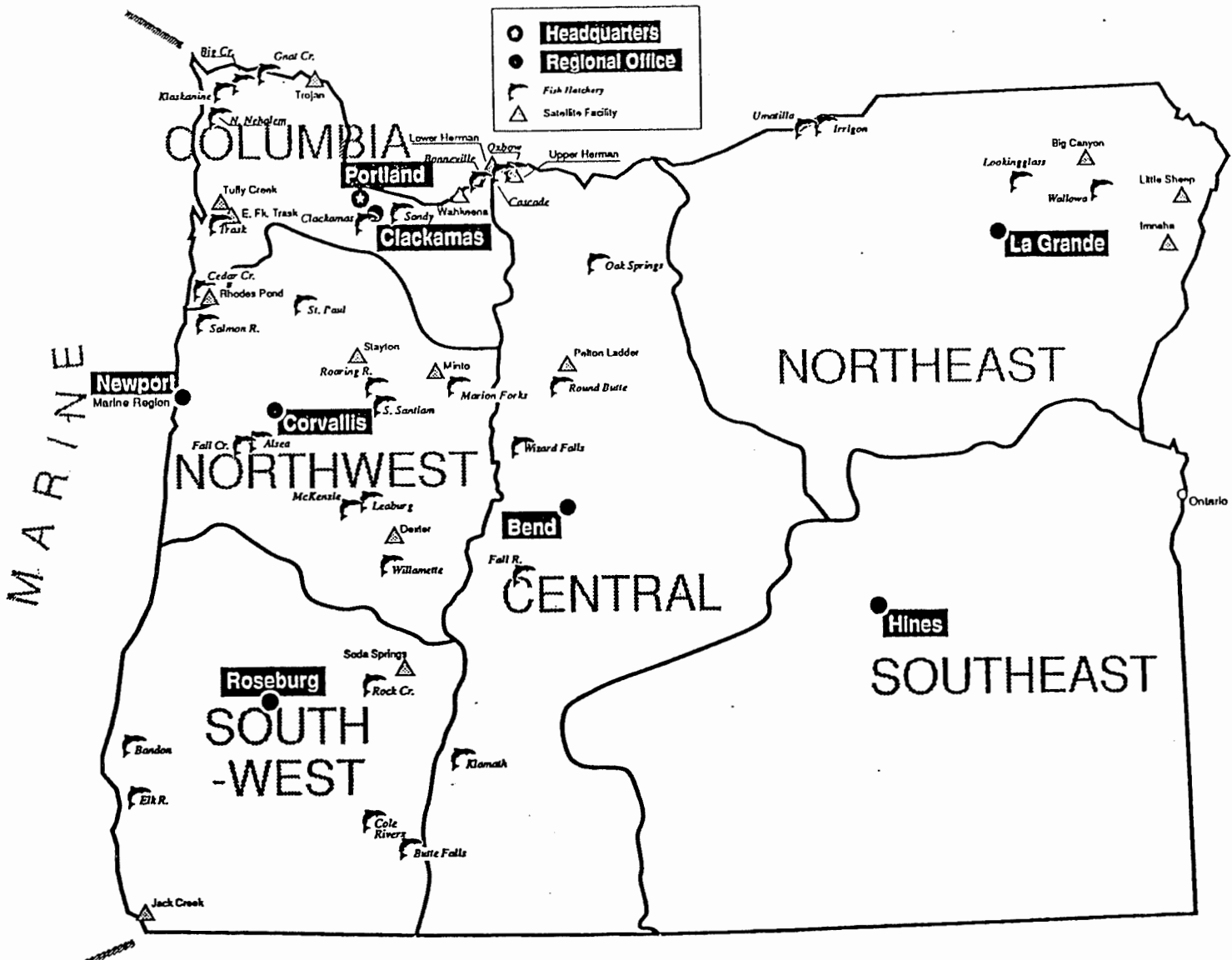
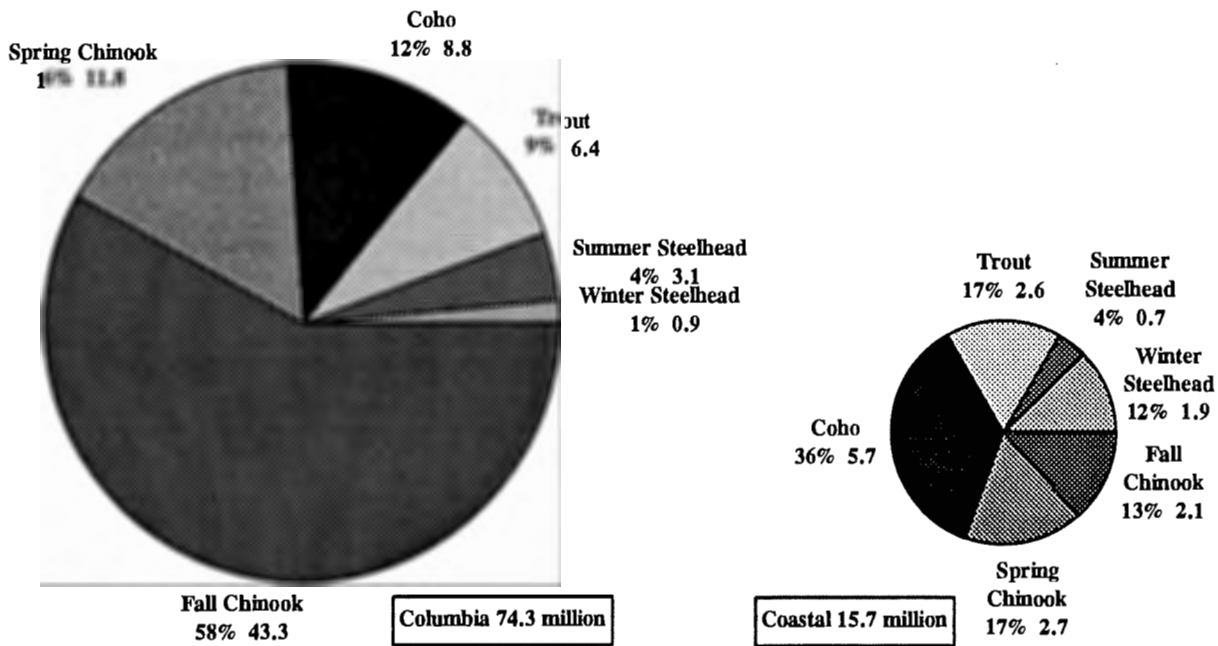


FIGURE IV-1
FISH PROPAGATION FACILITIES

FIGURE IV-2
HATCHERY PRODUCTION IN 1990



- Notes: 1. Figures in millions of fish releases (smolts, presmolts, gradeouts, and legals) for the 1990 production year.
 2. Size of pies are comparatively correct based on indicated region production totals.
 3. Production from Department operated hatcheries only.

and cutthroat trout are found in all production areas, although coho and cutthroat are not widespread in the upper Columbia drainage. Chum salmon are essentially confined to the coastal and lower Columbia production areas. A small introduced run of sockeye (*O. nerka*) persists in the Willamette River.

The natural production of salmonids hinges on the quantity and quality of the habitat supporting the fish populations and their food sources. Wild anadromous salmonids spend varying proportions of their life in freshwater, estuarine, and ocean environments. Changes in one environment will affect the production of fish, and ultimately the fisheries, by altering critical habitats or "niches" required to sustain the populations.

Soon after settlers arrived in the Pacific Northwest, the amount of habitat began to decline as impassable diversion and storage dams blocked access or became degraded from alterations in temperature and flow regimes, pollution, gravel removal, siltation, dredging, filling, and a host of similar actions. An estimated 50% of the Columbia River Basin once accessible to anadromous fish has been blocked by impassable dams. Furthermore, the remaining habitat accessible to anadromous salmon and trout has been significantly altered. Similar, although less extensive, activities have reduced the rearing potential of coastal streams, lakes, and estuaries. As a consequence, the quantity of anadromous fish derived from natural production

has suffered a similar decline. Hatchery augmentation is used to enhance natural production where feasible to sustain the fish populations and fisheries at optimal levels.

The first hatcheries in Oregon were built in 1877 on the Clackamas and Rogue rivers for salmon propagation. Several more were constructed in the next few years, and by 1900 all were under government control. The hatcheries remained under either state or federal control until 1971. In 1971 Oregon enacted a law (ORS 508.700) allowing the propagation of chum salmon by private citizens. In 1973 this law was modified by the legislature to include the propagation of coho and chinook salmon. Permission to propagate pink salmon was granted by the legislature in 1979.

Table IV-1 summarizes individual coastal hatchery production mix and receiving stream release points for the 1990 brood year. There are other STEP volunteer production facilities such as Young Bay (Clatsop County) and Wiskley Creek (Tillamook County) that are important contributors, but are not itemized in this table. Figures IV-3 through IV-5 show trends in releases by the Department, private hatcheries, and the STEP program for fall chinook, coho, and winter steelhead. The harvest of these releases is not confined to just Oregon ocean areas and inland streams. Figure IV-6 shows the catch area of hatchery released fish for Oregon, California, and Alaska/British Columbia/Washington.

Some salmon stocks shown on Figure IV-6, such as the Trask Hatchery reared fall chinook, have only minor harvests in Oregon waters. The origin of all ocean salmon catch is not well documented and considerable variation probably exists in the relative proportion of specific populations in the catch in any given year. Nickelson, et. al. (1992) estimates that 67% of total coho harvests between Cape Falcon (Manzanita, Oregon) and the Oregon-California border are from origins other than Oregon coastal hatcheries and Oregon coastal natural production in the 1985-91 time period. Very little cost-benefit analysis has been done on the disparity of catch whose origin is in-state and out-of-state. It is a research area of interest because of the U.S.-Canada Pacific Salmon Treaty (Pacific Salmon Commission 1992) negotiation process is to make fishery management regimes equitable to all parties. To-date, chinook catch rather than cost and benefits have been the basis of negotiations.

The equity in Oregon funds raised through user fees and general taxation which pays for fish production that contributes to other fisheries as compared to benefits received from stocks of out-of-state origin is important to satisfying this study's objectives, but its analysis is beyond the scope of the study. Benefits to the commercial and recreational fisheries compared to funds raised through user fees and the cost of hatchery operations is more straightforward.

Hatchery production as measured by releases contributes to ocean and inland commercial and recreational fisheries. Coded wire tags inserted in the nose of a sample of releases provides information about fish origin when recovered. This is combined with information about who, when, and where the fish was caught to develop a data base on species contribution to fisheries. Table IV-2 is a listing of hatchery production and percent contribution to total commercial and recreational fisheries based on the coded wire tag data base for Oregon operated hatcheries. The estimated species specific contributions were based mostly on 1982-

TABLE IV-1
 PRODUCTION MIX AND RELEASE POINTS FROM
 DEPARTMENT COASTAL HATCHERIES IN 1990

	Fall Chinook	Spring Chinook	Coho	Winter Steelhead	Summer Steelhead	Cutthroat Trout
Hatchery Production Mix						
North Nehalem			X	X		X
Trask	X	X	X			
Cedar Creek	X	X	X	X	X	X
Salmon River	X		X			
Alsea				X		X
Fall Creek	X		X			
Rock Creek	X	X	X	X	X	X
Bandon	X	X	X	X		
Elk River	X			X		
Cole Rivers	X	X	X	X	X	X
Butte Falls	X	X	X			X
Release Points						
Necanicum River				X		X
Nehalem River			X	X		X
Tillamook River				X		X
Miami River				X		
Kilchis River	X	X		X	X	X
Wilson River		X		X	X	
Trask River	X	X	X			
Nestucca River	X	X	X	X	X	X
Salmon River	X		X	X		X
Devils Lake					X	
Siletz River			X	X	X	X
Drift Creek				X		
Big Elk Creek				X		
Yaquina River						X
Alsea River	X		X	X		X
Tenmile Creek				X		
Siuslaw River			X	X		X
Munsell Lake			X			
Umpqua River	X	X	X	X	X	
Smith River				X		X
Eel Lake			X			
Millicoma River				X		
Coos River				X		
Coquille River	X		X	X		
Garrison Lake	X					
Rogue River	X	X	X	X	X	
Applegate River				X		
Rogue Lakes/Ponds			X	X	X	
Elk River	X					
Chetco River	X			X		

FIGURE IV-3
COASTAL FALL CHINOOK RELEASES

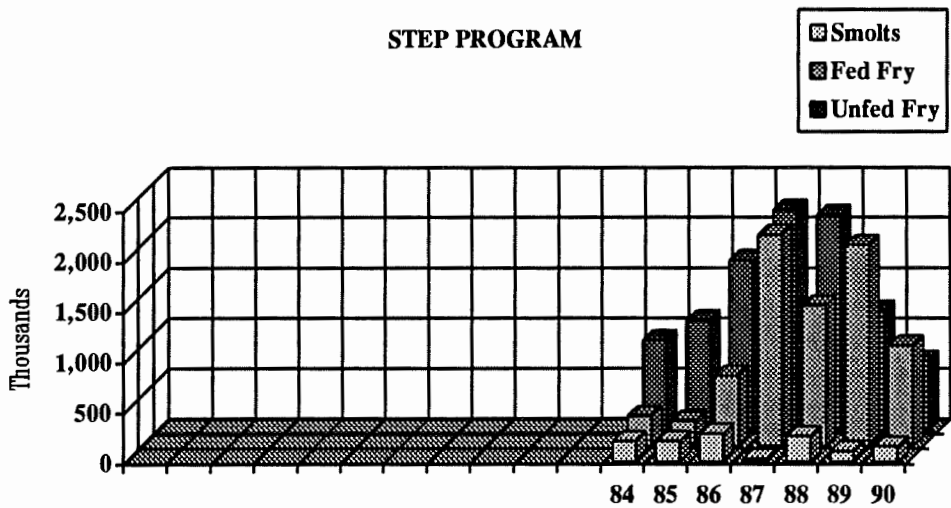
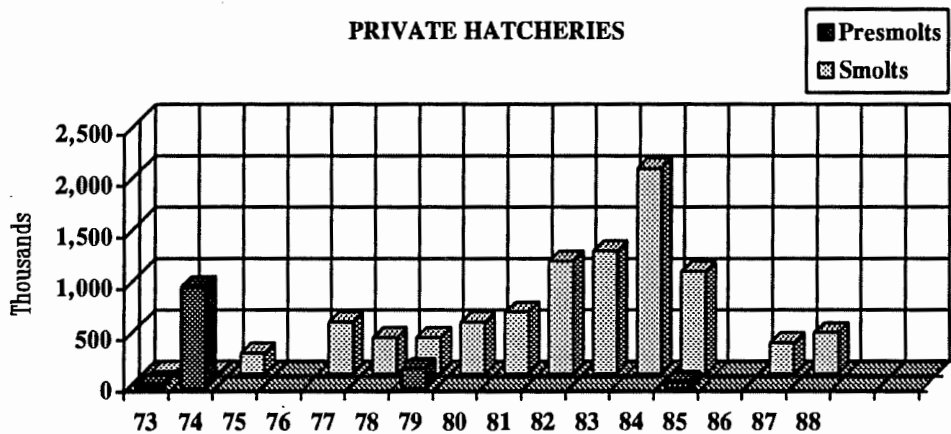
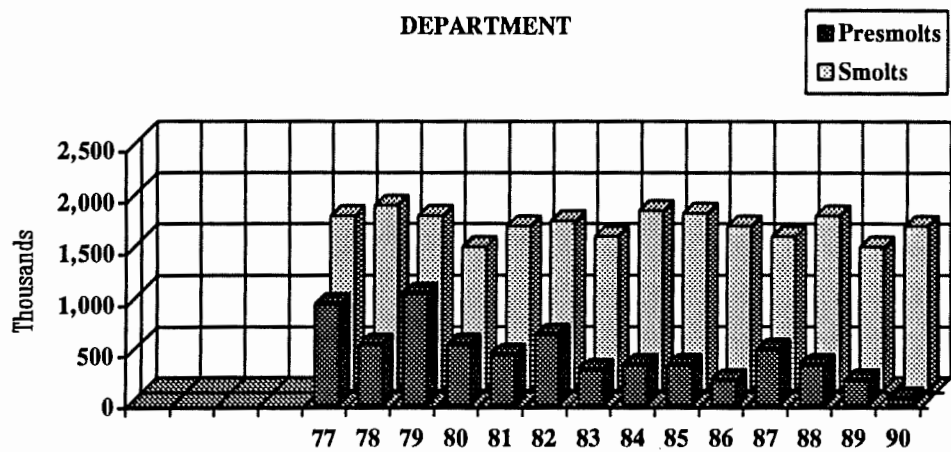


FIGURE IV-4
COASTAL COHO RELEASES

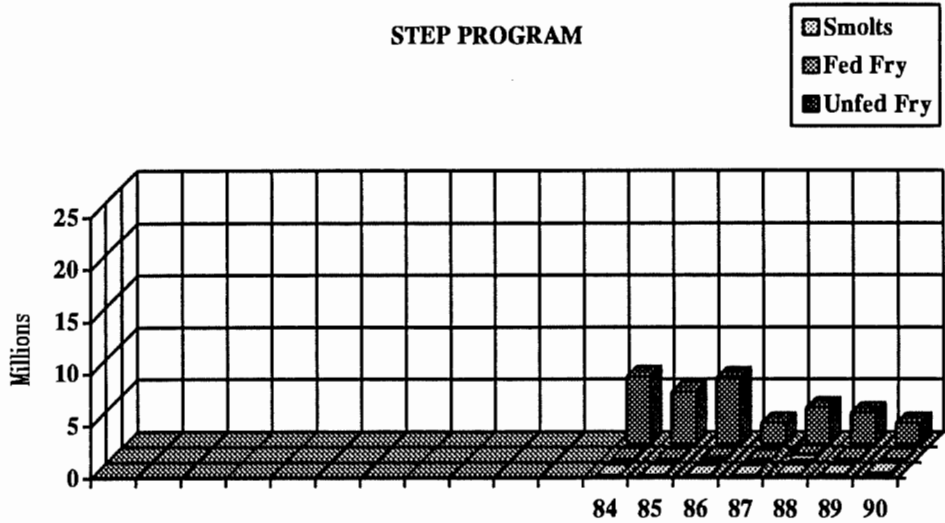
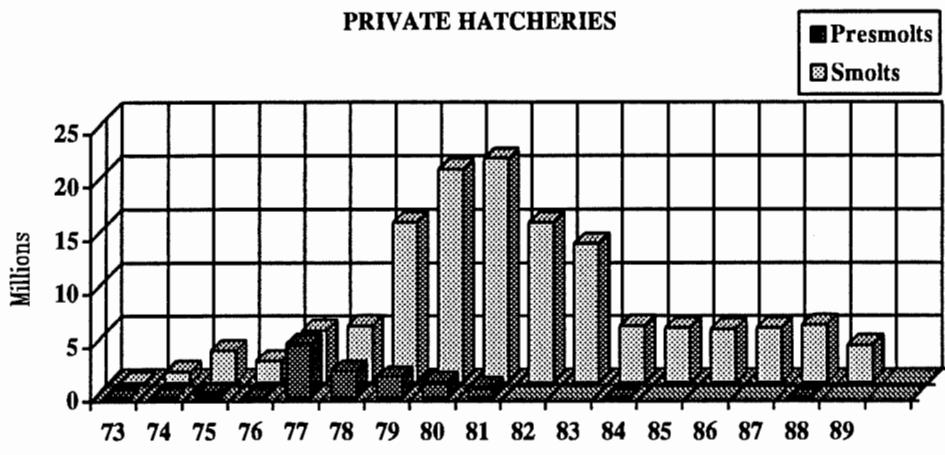
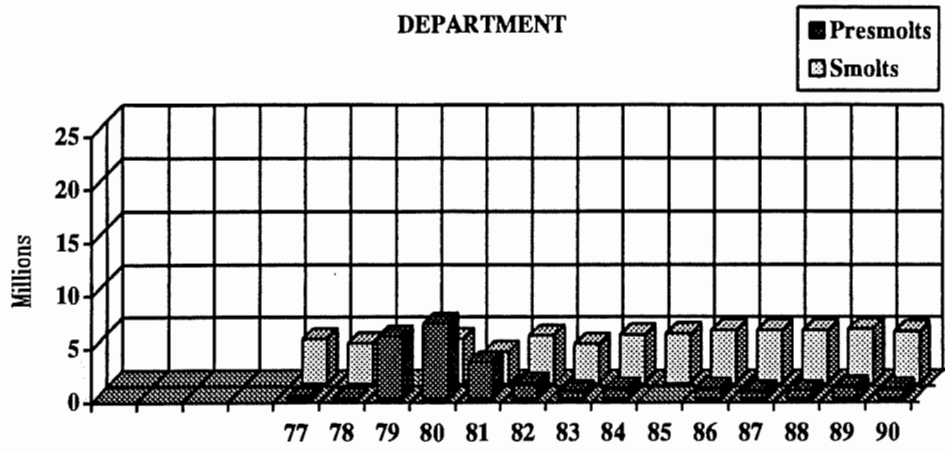
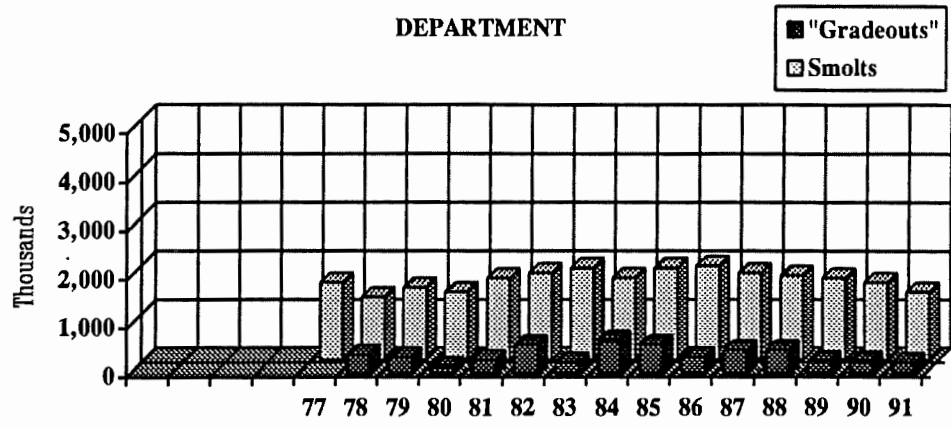


FIGURE IV-5
WINTER STEELHEAD RELEASES



Notes: 1. Smolts are defined as greater than 10 per pound.

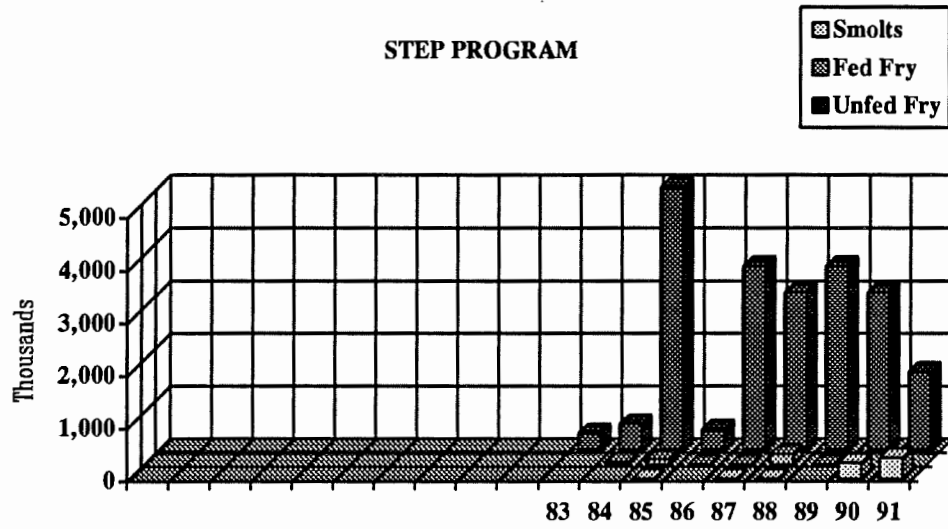
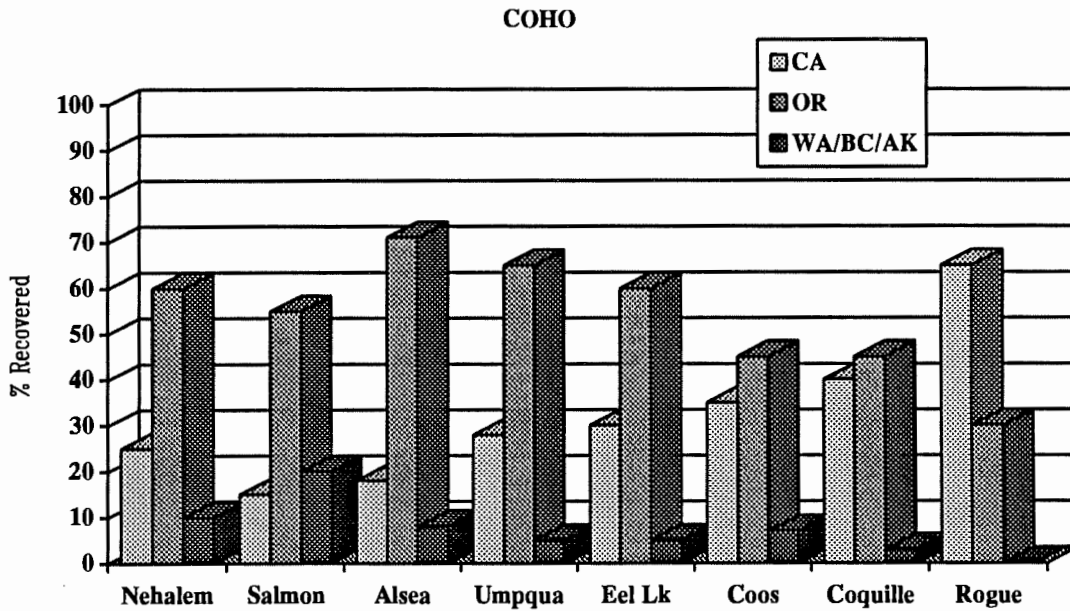
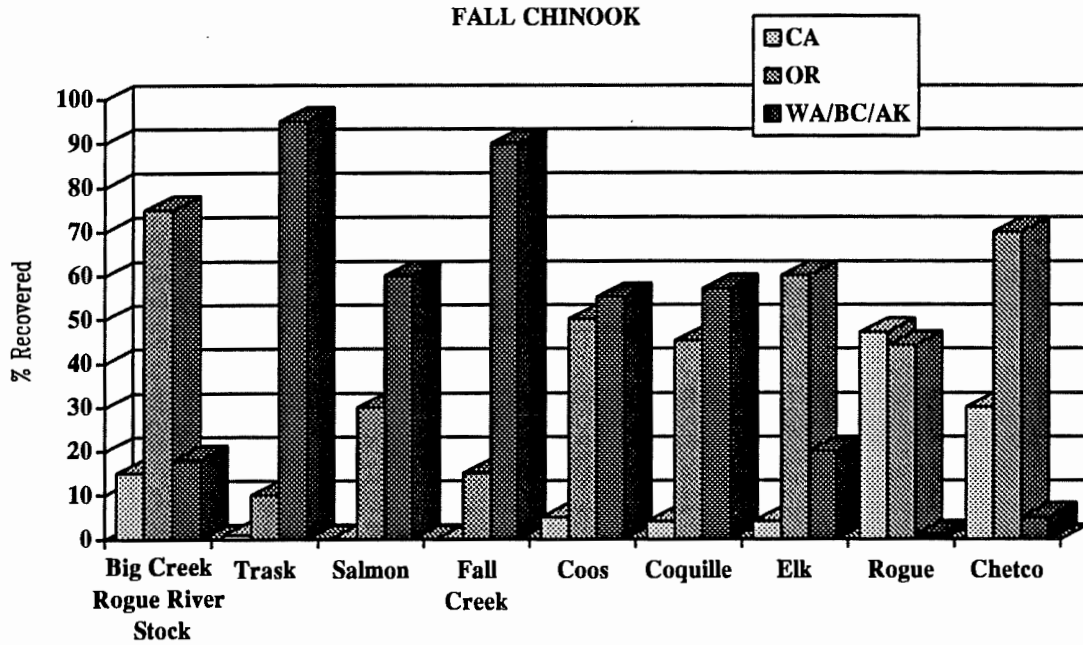


TABLE IV-2
HATCHERY 1990 PRODUCTION AND AGGREGATE PROPORTIONAL
CONTRIBUTION TO FISHERIES

Hatchery	1990 Production Amount (1,000's of Fish)	Percent	Fisheries Contribution	
			Commercial	Recreational
<u>Columbia Region</u>				
Big Creek Hatchery	15,210		83 %	17 %
Bonneville Hatchery	30,994		78 %	22 %
Cascade Hatchery	4,192		74 %	26 %
Cedar Creek	919		13 %	87 %
Clackamas Hatchery	1,629		54 %	46 %
Gnat Creek Hatchery	2,624		13 %	87 %
Klaskanine Hatchery	4,080		69 %	31 %
Nehalem	1,176		28 %	72 %
Oxbow Hatchery	6,692		74 %	26 %
Sandy Hatchery	1,007		72 %	28 %
Trask	2,255		67 %	33 %
Subtotal Columbia	70,778	60 %		
<u>Northwest Region</u>				
Alsea Hatchery	1,440		0 %	100 %
Fall Creek Hatchery	1,743		65 %	35 %
Leaburg Hatchery	1,031		0 %	100 %
Marion Forks Hatchery	1,754		47 %	53 %
McKenzie Hatchery	2,214		51 %	49 %
Roaring River Hatchery	1,544		0 %	100 %
St. Paul Ponds Hatchery	21		0 %	100 %
Salmon River Hatchery	1,818		49 %	51 %
South Santiam Hatchery	6,944		63 %	37 %
Willamette Hatchery	4,727		0 %	100 %
Subtotal Northwest	23,235	20 %		
<u>Northeast Region</u>				
Irrigon Hatchery	5,504		0 %	100 %
Lookingglass Hatchery	1,108		76 %	24 %
Umatilla Hatchery	NA		63 %	37 %
Wallowa Hatchery	793		0 %	100 %
Subtotal Northeast	7,405	6 %		
<u>Central Region</u>				
Fall River Hatchery	949		0 %	100 %
Klamath	2,499		1 %	99 %
Oak Springs	2,395		0 %	100 %
Round Butte Hatchery	681		5 %	95 %
Wizard Falls	2,607		0 %	100 %
Subtotal Central	9,130	8 %		
<u>Southwest Region</u>				
Bandon Hatchery	1,005		9 %	91 %
Butte Falls	1,617		31 %	69 %
Cole Rivers Hatchery	3,400		34 %	66 %
Elk River	964		58 %	42 %
Rock Creek	934		40 %	60 %
Subtotal Southwest	7,920	7 %		
Total Production	118,469	100 %		

**FIGURE IV-6
COMMERCIAL AND RECREATIONAL FISHERIES
RECOVERY AREA OF SELECT HATCHERY RELEASES**



- Notes: 1. Recoveries excludes returns to hatcheries.
2. Recovery based mostly on 1982-87 brood year coded wire tags for multiple catch years.

87 brood year coded wire tag recoveries and multi-year catches, however recovery information is not consistent between hatcheries due to differences in the tagging of fish at the various hatcheries. The proportion would be expected to vary as production, harvest abundance, and catch allocation between users change.

B. Revenue Sources and Cost Allocation to Benefitors of Fish Propagation

Chapter II discussed the Fish Propagation program area's 1991-93 budget which totals \$36.6 million including capital improvements and construction. Of this amount, 22% is General Funds, 59% Federal Funds, and 19% Other Funds. Table IV-3 summarizes the budgets for hatcheries operated by the Department. The table is organized by the primary source of funding.

Hatchery operation cost allocations can be assigned to General Fund and Other Fund sources based on commercial and sport catch, respectively, using the percent of hatchery production caught by sports fishing shown in Table IV-2. The Federal Fund and miscellaneous or mostly utility contributed funds are assumed constant for this analysis. This is a somewhat simplistic assumption as the purpose of certain federal and utility support for hatcheries is based on commercial and sport fisheries mitigation of fish habitat loss due to dam projects. This assignment can be shown using the Cedar Creek Hatchery. Its production and coded wire tag recovery data are as follows:

Species	1990 Production (No. of Fish)	Total Sport Catch %
Fall Chinook	149,040	18 %
Trout	160,923	100 %
Spring Chinook	116,947	24 %
Steelhead	491,611	100 %
Total	918,521	87 %

The total sport catch share is a weighted average based on species production. If funding was based on the commercial and recreational catch share with General Funds assigned to commercial and Other Funds assigned to recreational fisheries, because of how user fees are accounted for within the Department budgets, then the funding would be as follows:

	1991-93 Biennium	Assignment	Change	
			Amount	%
General Fund	380,480	98,925	-281,555	-74 %
Other Fund	380,480	622,035	+281,555	+74 %
Federal Fund	0	0	0	0 %
Misc.	0	0	0	0 %
	760,960	760,960		

TABLE IV-3
HATCHERY FUNDING BY PRIMARY FUNDING SOURCE

	Total	General Fund	Other Fund	Federal Fund	Miscellaneous Income
Federal Hatcheries	13,739	38	38	13,606	57
State Hatcheries	8,193	4,020	4,140	0	33
Mixed Hatcheries	5,640	1,487	288	3,453	449
Utility Hatcheries	449	0	0	0	449
Total Hatcheries	28,021	5,546	4,466	17,059	988

- Notes: 1. Amounts in thousands of dollars for legislatively approved 1991-93 Biennium budget.
2. Amounts do not include the Fish Propagation program area for management and research.

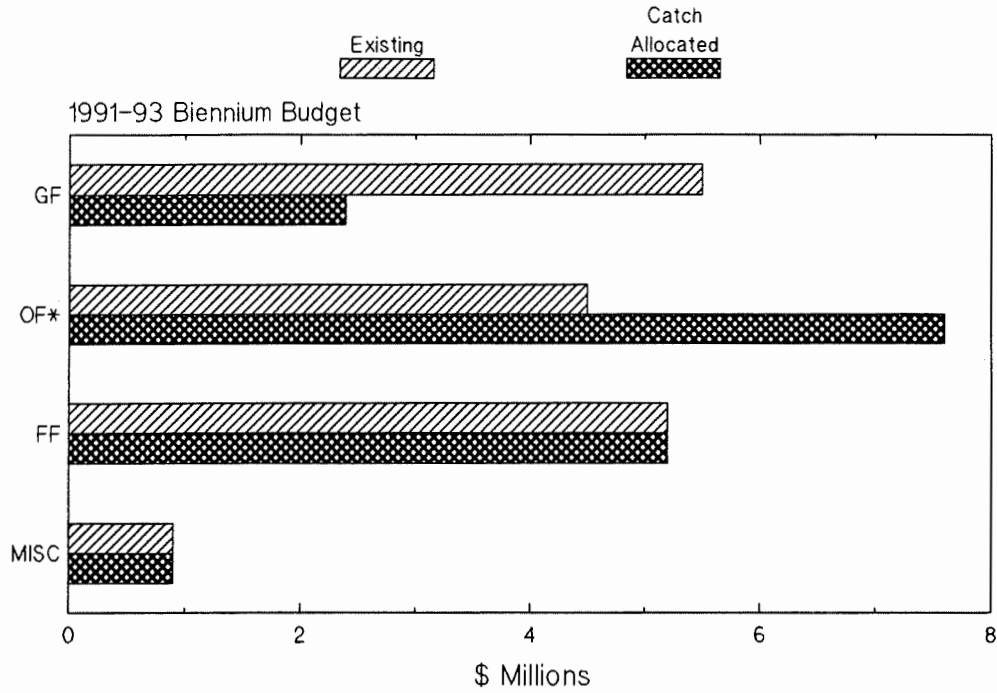
Table IV-4 and Figure IV-7 depict the total funding change over all hatcheries for this analysis. The total change with the cost allocation would be a decrease of 44.5% in General Fund support and an increase of 53.7% to Other Fund support. Recognizing that General Funds are approximately 1/3 commercial user fees (including non-anadromous related fees such as groundfish), and Other Funds are approximately 3/5 sport user fees, the analysis suggests that a substantial proportion of General Fund revenues used to pay for hatchery production contributes to the recreational fisheries. This exercise is an example of the analysis required to determine equity in the level of contribution of fee revenues, the cost of providing services, and who receives the benefits from the services.

TABLE IV-4
COST ALLOCATION OF HATCHERY FUNDING
BASED ON FISHERIES CONTRIBUTION

1991-93 Biennial Funding			
General Fund		Other Fund	
<u>Amount</u>	<u>% Change</u>	<u>Amount</u>	<u>% Change</u>
-2.8	-44.5%	+2.8	+53.7%

- Notes: 1. Amounts are in millions of dollars.
2. Amounts are summed over all hatcheries and species.
3. Other funds are exclusive of federal and utility agreement funds.

FIGURE IV-7
COST ALLOCATIONS OF HATCHERY FUNDING BASED ON CATCH



- Notes: 1. GF--General funds are approximately 1/3 commercial fees, including non-anadromous related fees such as from groundfish.
 2. OF*--Other funds, exclusive of miscellaneous income funds, are approximately 3/5 sport fees.
 3. FF--Federal funds.
 4. MISC--Miscellaneous funds include contributions from utilities.

V. FISH RESOURCE MANAGEMENT AND USE BENEFITS

A. Introduction

The quality of Oregon's environmental amenities, including fish resources, enriches the lives of Oregonians and attracts tourists and business. The enjoyment of fish resources makes significant economic contributions to the State's economy. Jobs and income are created through recreational fishing and commercial fish harvesting and processing. In addition to the contribution to the financial flows of revenues, expenditures, and associated personal income created in the economy, the fisheries are highly valued by resource users and Oregon residents. Recreational anglers and Oregon residents received benefits in terms of enjoyment and quality of life above and beyond their participation costs. These benefits, which can be estimated by indirect methods, are not captured in the estimates of impacts on the State's economy in terms of jobs and personal income. Because these values are an important part of any policy making, the following discussion focuses both on the economic contributions or *economic impacts* and on *economic valuation*.

Economic contributions of fishing activities are estimated for the State. Because economic valuation is most useful when changes in use are contemplated, only the concepts are discussed. No *net valuation* of the total fishery, either recreational or commercial, is made.

Economic values refer to the direct benefits received by those that fish and the value people place on fishing. There also may be economic values to "nonusers," i.e. preservation or existence values to people who don't actually fish or even visit Oregon. Economic impacts consider how many people participate in fishing, how much they spend while fishing, and the resulting impact (e.g. jobs or personal income) on the local and state economy. This section does not address the costs of providing the resources or services. Neither are the economic impacts of government expenditures to provide fish resources included. Generally, only the end products are valued, such as a recreational fishing day or a commercially harvested fish. There may be cases where the expenditures of raising a fish in a hatchery and the costs of managing a recreational fishing season may be greater than the expenditures related to the harvesting of the fish.

The following section discusses the role of public agencies in natural resource management, describes the different types of market and nonmarket economic values and impacts that the waters of Oregon provide, reviews previous studies of these values, and discusses applications and methodological concerns of economic information as applied to valuing Oregon's fisheries.

B. Role of Public Agencies in Natural Resource Management

There are three basic cases when an unregulated market will fail to provide the optimal amount of goods and services (market failures). The first is *externalities*. In a market economy, it is assumed that all of the consequences of a decision are borne by the agent making the decision - there are no "spill-over" effects. An externality exists wherever this is not the case. Externalities can be either negative or positive and can be associated with the production or consumption of a good. An example of a negative production externality is when a manufacturing plant dumps pollutants into a river which affects fish stocks and thus the quality of water and fish stocks. Unless the anglers are also managers of the company, an economically efficient level of pollution will not result. That is because the party that benefits from polluting the river is not the party that bears the cost of the pollution.

The classic example of a positive consumptive externality is the farmer who keeps bees for his orchard. The bees also benefit the surrounding farms by pollinating their fruit trees also, free of cost. With proper information, it can be argued that efficient output and prices can be achieved with taxes or subsidies to internalize such externalities.

A second source of market failure is *free access resources*. These resources are not owned by any one single person and access is not restricted, thus leaving them open to exploitation. One of the most obvious such common property resources is fisheries. Almost anyone can purchase a boat and a license and start fishing, either commercially or recreationally. In such cases, the process leaves the most valued fish species to become overexploited. This will result when no one person owns the stock of fish and there is no incentive for conservation. Why should a fisherman individually reduce his harvest when there is a boat next to him waiting to catch what he refrains from catching?

Public goods are the third market failure. These are goods for which one person's consumption does not diminish another person's consumption of the same good. Examples include vistas and biodiversity. The private market will underproduce these goods due to the free rider problem. This is when a consumer has an incentive to understate his true willingness to pay, since he can enjoy the benefits from someone else's contribution. A public good is a product or service which the many actors in the private sector may not have the incentive to produce in amounts desired. A pure public good cannot be withheld from some consumers who refuse to pay (non-exclusion), and consumption of that good by one person does not reduce its usefulness to someone else (shared consumption). Due to non-exclusion and shared consumption, private firms have no means of profiting from production of public goods, even though society may value these goods highly.

The market for fishery management suffers from many of these market failures. Fisheries management provides many goods and services. However, few benefits accrue solely to the owners of a single section of land, leaving the remainder in the category of positive consumptive externalities. Moreover, the agencies' actions benefit free access resources such

as fisheries. Also, the goods and services provided by the fishery agency are public goods such as biodiversity and protection of endangered species.

A summary of possible benefits related to fisheries management is displayed in Figure V-1. The process of providing information on such benefits may come through the market place or through some other valuation technique.

C. Measuring Economic Values and Impacts

1. Economic Valuation

Economic value is only one of many ways to describe the "worth" of some resource or service. The fishery resource provides an excellent example of this. Native salmon have many different types of value. A biologist may say that the values of the native fish are their genetic contribution to the survival of the species. An angler may say that the value of the native fish is in their challenge and fight, and the sense of accomplishment at having landed one. A nutritionist may find no difference in the value of native and hatchery fish, both providing the same calories, protein, etc. All of these people would be describing some aspect of the value of native fish, but none would be describing the economic value.

Economic value is very precisely defined as the relative value of a good or service, or what someone would be willing to give up (pay) in exchange for that good or service. This definition describes an anthropocentric view of value, that is, value to people. Therefore, for a fishery resource to have economic value, people must be willing to give up other valuable resources (which can be represented by money) in order to have the fishery resource. Clearly this makes economic value a function of peoples, preferences and their ability to pay (income).

When measuring economic value, it is not necessary to know why people value a resource (e.g. for nutritional reasons, for biological reasons, for recreation reasons), but rather how much they value it relative to other things. This makes it clear that economics is the appropriate tool when the objective is to allocate scarce resources. (A scarce resource is defined as a resource that people desire and need and of which there is a limited amount. A resource such as air may not fit this definition unless clean air becomes polluted.) For example, if something of value must be given up to save native fish populations, society needs to know whether the native fish are worth more than what must be given up. Information about the biological, nutritional, or recreational value of fish will certainly affect peoples' willingness to pay for the resource, but the economist does not need to know the motives behind peoples' willingness to pay in order to make socially efficient resource allocations. The calculation for social efficiency requires information on the total value of resources, that value being the result of many different motives. While recognizing that total value is the goal, there are methodological issues related to the measurement of economic value that have led to a distinction between different types of economic value.

Benefits Related to Fish Resources	Current User Benefits	Use	Resource No or Low Consumption	<ul style="list-style-type: none"> Recreational - swimming, boating, rafting, etc., related to water of sufficient quality and quantity necessary for fish habitat Relaxation - viewing fish, fishing with release
			Resource Consumption	<ul style="list-style-type: none"> Ocean commercial fishing In-river commercial fishing (crabbing, gillnet, crayfish, etc.) Recreational fishing without release
			Habitat	<ul style="list-style-type: none"> Recreational - hiking, picnicking, birdwatching photography, etc. Aesthetic - enhancement of adjoining site amenities
	Intrinsic Benefits	Potential Use	Option	<ul style="list-style-type: none"> Near-term potential use Long-term potential use
		No Use	Existence	<ul style="list-style-type: none"> Stewardship - maintaining a good environment for everyone to enjoy (including future family use-bequest) Vicarious consumption - enjoyment from the knowledge that others are using the resource Genetics, water quality, education, research, etc.

FIGURE V-1
SPECTRUM OF POTENTIAL ECONOMIC BENEFITS

a. Use Value

People may value a particular resource such as the fishery because they either use the resource currently, or they intend to use it at some time in the future. Current and future use value can be either direct or indirect. An example of direct use value would be the willingness of anglers to pay for access to the salmon in Oregon fisheries. This may be actual price paid, which may be market price or any price that may not signal a "market clearing" price; an angler may be willing to pay more than he is being charged on the market. An example of indirect use value would be the willingness of a reader to pay for a magazine account of a fishing trip to Oregon. In both cases, someone had to actually use the site or resource in order for something of value to be produced.

Since the anadromous fish of Oregon river basins contribute to the overall ocean stocks, some of the use value of these fish is actually realized in the ocean fishery. In a sense, there is a derived demand for the habitat of Oregon rivers since they are an input into the ocean fishery "product."

The willingness to pay for future use of the resource is called option price. This price represents the expected value of the future trip (expected consumer surplus), plus (or minus) any "option value." The option value represents any additional (or less) willingness to pay (above expected consumer surplus) for the option of future use, when future use is uncertain. Some have described option value as a kind of insurance premium, to guarantee that the resource will be available when, and if, future use is desired.

b. Non-use Value (Intrinsic Value)

There are some people who are willing to pay for a resource, even though they never intend to use it. This type of non-use value is called existence value, because people are willing to pay to ensure that a resource exists, knowing that they will never actually use the resource. The motive for existence value may be that people want to ensure that a resource exists for future generations to enjoy. Some economists have separated this type of existence value into a separate category called bequest value, but it is clearly a subset of existence value.

c. Which Value to Measure?

It is likely that the fishery resource of the Pacific Northwest provides all of the above types of values to society. The decision about which ones to focus on for measurement is a function of the resource allocation question being asked. For example, if a particular fishery resource is not threatened with extinction, there is no need to measure the existence value of that resource. Since society would not be deciding whether to allocate scarce resources to save the fishery, the existence value is not relevant. If the policy decision under consideration is whether to invest resources to increase the fish populations, then the values which are measured must correspond to only the increase in fish numbers. In other words, total use value would not be the appropriate value to compare with the value of the resources necessary to increase the population by some incremental amount. Given the different types of policy decisions which

might be relevant, as well as the fact that the existence of some Oregon fish populations may be in question, measurement of total and marginal values are likely to be useful to decision makers.

2. Economic Values vs. Economic Impacts

The economic value of the fishery resource has been defined as people's willingness to give up resources of value (money) to have the fishery resource. This is commonly called net economic value or NEV (net economic value above costs) or NED's (National Economic Development accounts). A common mistake that is often made is to include the costs associated with using the fishery resource (e.g. travel costs, lodging costs, equipment) as part of the economic value of the resource. These associated costs, or expenditures, are instead the source of local or regional economic impacts associated with use of the fishery. These are commonly called the RED's (Regional Economic Development accounts).

Since economic values are used to allocate scarce resources, the economic value must represent the value of the fishery resource itself, and not the value of the related travel and equipment items. For example, suppose the fishery was threatened by a hydropower development and policy makers wanted to know whether the anglers could "buy out" the hydropower interests, if necessary. All of the money spent on travel and equipment is no longer available to be used to buy out the competing hydropower interests. However, the money that is left over, after all the costs of angling have been paid, is the net willingness to pay (consumer surplus) for the fishery resource (or site) itself and could be sufficient to buy out the hydropower interests.

Another way to view the difference between economic value and economic impacts is to consider economic value as the net loss to society if the resource was no longer available. Suppose that a specific river fishery was no longer available to anglers, and they had to either fish somewhere else or engage in some other activity. The money spent on travel and equipment would not be lost to society - in fact it could be spent on travel and equipment or some other commodities in some other location. But the value anglers received from fishing that specific river would be lost. It must be assumed that one river's fishing was preferred over (had greater value than) the other rivers or activities, or the anglers wouldn't have chosen the one site in the first place. Their net willingness to pay for the chosen fishery would be a loss to society. Their expenditures or associated impacts on income or jobs would be a loss to the economy of the preferred river but, if shifted elsewhere, would be a gain to some other local economy. Economic impacts, therefore, describe the local or regional effects on jobs and income associated with any specific area chosen as the point of interest.

The above example should make it clear why local economies are often more concerned about economic impacts than economic values, especially when the economic values are in the form of consumer surplus. If anglers are willing to pay some amount of money over and above their costs, but don't actually have to pay, the consumers get to take that surplus or value home with them in their pockets. It is not immediately obvious to local businesses that the consumer surplus generated from any specific fishery has any impact on the local economy.

On the other hand, money spent on lodging, food, supplies, guides, etc., has a direct impact on local businesses.

It is clear that economic value and economic impacts are two distinct measures, and each is useful for different purposes. Economic values are important if the goal is to allocate society's resources efficiently. Economic impacts are important in assessing the distributional impacts of the different allocation possibilities. It may often be the case that society will want to invest in a less valuable resource because the local area or economy that holds that resource is in need of economic development. Nevertheless, having the information on economic value will tell society how much they are giving up in order to achieve the redistribution of economic activity or development.

D. Methods of Measurement

Two basic measures, net economic value (NEV) and local personal income impacts, can be used to estimate the economic effects of alternative resource use. NEV refers to the difference between the gross value of an economic activity and the costs (properly defined and measured) of carrying out that activity. The local personal impact (RED) measures the change in income that people in a given region will receive in the form of wages, salaries, and proprietary income and profits.

1. Estimating Net Economic Value (NEV)

a. Recreational

Because recreational fishing areas are mostly located in public areas, prices for the use of the fishing area play an insignificant role in the valuation process. A frequently used approach is to estimate the value that a recreational fisherman places on his recreation experience through surveys on their actual cost or on their "willingness to pay." The value may be on the experience of the total fishing opportunity; catching of the fish being only part of that opportunity. Travel costs surveys and other survey information have been used as basic data in economic models to estimate the NEV of publicly provided fishing experiences.

There have been many studies completed on the NEV of the recreational fishing resource. Two fairly recent publications summarize these studies. Loomis and Sorg (1989) (their recommended Pacific Northwest Recreation Activity Values are listed in Table V-1), and Riely (1988). These reviews are usually for specific studies. Although it may not always be appropriate the results from such specific studies can be used to set generalize "bounds" on economic values.

For the Pacific Northwest and Oregon, a review of the following studies provides an estimate of suggested NEV for a recreational fishing day. (Specific sites may vary; such values should only be used as guidelines.) These studies are: Brown and Shallof (1987), Brown and Hay

TABLE V-1
REGIONAL RECREATION ACTIVITY VALUES

Anadromous Fishing	\$52	Motorized Travel	\$12
Cold Water Fishing	\$24	Camping	\$9
Warm Water Fishing	N/A	Picnicking	\$10
Salt Water Fishing	\$50	Hiking	\$16
Big Game Hunting	\$48	Wilderness	\$28
Small Game Hunting	\$21	Downhill Skiing	\$50
Waterfowl Hunting	\$40	Water Sports	\$12
Upland Game Hunting	\$40		
Motorized Boating	\$6		
Nonmotorized Boating	\$10		

Notes: 1. Units are personal income impacts per recreation visitor days.

Source: Loomis, John and Cindy Sorg. "A Critical Summary of Empirical Estimates of the Value of Wildlife, Wilderness and General Recreation Related to National Forest Regions." Rocky Mountain Forest and Range Experiment Station. 1990. Fort Collins, Colorado.

(1987), Brown, Sorhus, and Gibbs (1980), Crutchfield and Schelle (1982), Hay (1988), and Olsen, Richards, and Scott (1990).

Because these "net values" per day in general tend to be similar, several agencies such as the Oregon Department of Fish and Wildlife and the Pacific Fishery Management Council has selected the Brown study (1980 and 1987) and Crutchfield (1982) studies as values that provide some guidance.

Brown et al. (1980) estimated the average NEV per day for ocean salmon fishing to be \$26.12. Adjusting this value to 1989 dollars using the ratio of the gross national product price deflators from 1989 and 1977 (about 1.82) provides an average NEV per day of \$47.54.

An indication of the annual net economic benefits of salmon and steelhead angling is contained in a recent study by Olsen, Richards, and Scott (1990). According to their estimates, anglers' average willingness to pay (above cost) per recreational fishing day ranges from \$32.68 for coastal river fishing to \$51.19 for ocean salmon fishing. This compares to a suggested value of \$50.00 per day in the Loomis report.

Brown and Hay (1987) estimated the average net economic value per day of trout fishing for residents of most states using data from the U.S. Fish and Wildlife Service's 1980 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Their estimate for Oregonians' average net economic value per trout angling day was \$12. Adjusted for inflation, this amounts to over \$18 per day in current dollars.

A more recent study by Hay (1988) used data from the U.S. Fish and Wildlife Service's 1985 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Hay analyzed survey questions on anglers' willingness to pay for bass fishing. The net economic value

estimate for Oregon residents was \$8 per angler day, which if adjusted for inflation would be about \$10 per angler day. Estimates for warmwater fishing in Idaho based on several extensive angler surveys conducted in 1982 and 1983 ranged from \$12 to \$26 per average angler day.

These estimates represent an average value per angler day. Conversion of this number to a marginal value associated with any significant decrease or increase of allocated fish requires additional assumptions about the number of angler days of use supported by each additional fish. Success ratios reflect the harvest rates in any specific area. Most analyses assume that additional fish allocated to the recreational fishery will increase recreational effort proportionally to the success rates. (For example, at \$50 per day a success rate of 1 fish per day may result in a \$50 per fish value; a success rate of 1.5 would result in a lower \$33.33 dollar per fish value.) This may or may not be correct but, lacking any additional information, such an assumption may be acceptable, within narrow bounds. The Olsen study estimated marginal net values for doubling catch (or going from zero to one fish caught) to range between \$18.17 and \$25.26 per fish.

User values are at times not the only values that a society places on a resource. The Olsen study also estimated the Total Economic Value (existence value, option value, and consumer surplus) for doubling the size of the Columbia River Basin Fish Runs to be \$68.49 per additional fish.

b. Commercial (NEV)

To compute the net economic benefits from commercial fishing the costs of harvest (fuel, repairs, labor, etc.) should be subtracted from the gross revenues (ex-vessel price). Because the fishing season is of short duration, most fishing boats are not limited to salmon fishing. The investment in boat and gear is also used for other fisheries. Also, at low levels of total salmon harvest and with small incremental changes in salmon production, it is often argued that any increased harvest could be taken with almost the same amount of labor, fuel, ice, etc. as before. Since the current fisheries (both the harvesting sector and processing sector) are greatly overcapitalized, in use of fixed and operating capital as well as labor, this is a plausible assumption. This assumption implies that almost no additional fleet costs are incurred for an increment in catch, and gross benefits are close to net benefits.

Generally, any valuation of salmon species involves a geographic area and a salmon species for which there are many substitutes. In such cases, the demand curve is relatively flat. That is, if consumers are faced with a rise in the price of one type of salmon in one area, they will simply shift their consumption to an alternative salmon product (or other protein substitute). In such cases, there are no extra benefits that could be counted resulting from consumers' willingness to pay different prices for a specific salmon product. Therefore, most economic valuations involving salmon will center on the benefits that a producer receives from the harvesting and processing of salmon.

The assumption of full employment is implicit in most benefit and cost analysis. But unemployment and excess fishing capacity, both transitory and chronic, seem to prevail in many Pacific coastal communities dependent on commercial fishing. Changes in markets or fishing opportunities may make it necessary for people and capital to change occupations and/or locations. Various factors make it difficult for this to happen quickly enough to prevent a period of unemployment and idle capacity. The Water Resources Council (1979) suggests that when "idle boats" are available, the only incremental costs of increased harvest will be the operating costs.

Rettig and McCarl (1984) made recommendations on the calculations of commercial fisheries NEV's. Their recommendations range from 50 to 90 percent of ex-vessel prices and processor margins. (Processor margin is the difference between their purchase price, ex-vessel price, and their sales price.)

In periods of reductions, the 90 percent rule would be appropriate. However, if the total salmon harvest increases it might not be appropriate to use the 90 percent level. A more appropriate level might be the 50 percent level (the lower level recommended by Rettig and McCarl (1984)). In a situation where new resources (capital and labor) were needed to harvest and process a greater amount of salmon, the actual additional costs of harvesting and processing would have to be deducted from the ex-vessel price and the processors' margin in order to arrive at the NEV of additional salmon harvest.

Because it is difficult to collect data on the commercial fishing industry for specific areas and specific gears and almost impossible to compare such estimates on a wide geographic and industry basis, a general guidance may be to present information on an ex-vessel basis (properly defined so as to be comparable) and on a first level primary processing basis. (This being the minimal amount of processing required to move the fish out of the region - dressing, icing, packing, etc.) The first level processor basis should be used because in many areas tendering costs and other costs and incentives of specific fisheries may not reflect the actual ex-vessel prices. It may also be argued that the first level processing in any area is inseparable from the harvesting component.

One survey of salmon trollers estimated that if they were not salmon trolling they would be working at alternative employment at an average of \$131 per day. This could be used as one indicator of the net value of salmon trolling, especially the opportunity cost of labor involved in salmon trollers (Radtke and Jensen). For illustration purposes, Table V-2 describes typical, recent ex-vessel prices per pound, yield figures, and ex-processor prices per pound for some species of salmon in Oregon.

From the above example it can be seen that it is important to specify the species, harvesting gear, product form and ex-processor price in any analysis.

TABLE V-2
EX-VESSEL PRICES

<u>Species Gear and Product</u>	<u>Landed Ex-Vessel Price</u>	<u>Round Weight Equivalent Price</u>	<u>Yield Percent</u>	<u>Ex-Processor Price Processed Product</u>	<u>Ex-Processor Price Processed Product Round Weight Equivalent</u>
Troll Coho Fresh	1.00	.85	head on 85	1.90	1.62
Troll Chinook Fresh	2.00	1.70	head on 85	2.90	2.47
Gill Net Chinook Fresh	1.90	1.90	head off 78*	3.20	2.50
Gill Net Coho Fresh	.80	.80	head off 78*	1.90	1.48

Notes: 1. Average prices 1989-1992.
2. Eggs included in yield percent.

2. Estimates of Personal Income Impacts

The amount that commercial fishermen and processors spend to prepare a consumer-ready product for market, or a recreational fisherman spends to take part in a fishery, has an important impact on the local and regional economy. In addition, purchases made by the harvester, processor, or tourist-related business will cause suppliers to purchase additional inputs in the form of labor, more inventory, and other items. As workers and entrepreneurs receive wages, salaries, and profits from these activities, they spend money in the local area for a variety of goods and services. The total effect on the local economy depends upon the amount of the original dollar expenditures and the amount which is spent for subsequent purchases within the local economy. This effect is closely tied to the total expenditures, types of expenditures, and structure of the economy. Economic input-output (I-O) models are often used to estimate the impact of resource changes on the local economy and can also be used to estimate contributions to larger areas such as state economies.

a. Sport Fishing

Over 750,000 individuals (roughly 80 percent residents and 20 percent nonresidents) paid for Oregon fishing licenses in 1990. In addition, a number of Oregonians hold permanent senior citizens or pioneer fishing licenses. Over 80,000 of these senior and pioneer licenses have been issued since 1984.

According to a survey of anglers recently completed for the Department (The Research Group, 1991), about eight million activity days (any portion of a day spent angling) of recreation were

taken in the one year period from September, 1988 through August, 1989. The distribution of activity days among the major species groups is shown in Table V-3.

During the survey period, anglers spent over \$280 million on items purchased during their fishing trips. The economic contributions associated with these trip expenditures were about \$250 million in total personal income (direct, indirect, and induced) at the state level. Anglers also spent an estimated \$760 million on durable equipment used primarily for fishing. The personal income associated with the equipment expenditures was about \$670 million at the state level. A summary of uses related to sport fishing is provided in Table V-4. Table V-5 provides estimates of the contributions to Oregon personal income per angler day associated with some of the major species.

TABLE V-3
SPORTS FISHING ACTIVITY DAYS

<u>Species Category</u>	<u>Percent of Total Angler Days</u>
Trout	49%
Salmon	18%
Warmwater	13%
Steelhead	10%
All Others	10%

TABLE V-4
USES RELATED TO SPORT FISHING

1. Number of paid angling license holders	752,000	(1990)
(excludes activity by up to 40,000 senior and pioneer permanent license holders who are not required to purchase licenses and tags annually)		
2. Number of angler activity days for all types of angling	8,026,000	(1989)
3. Sport fishing expenditures and associated impacts on personal income in Oregon		
A. Expenditures (1989)		
1. Angling trip expenditures	\$282 million	
2. Equipment expenditures		
a. All items prorated to angling	\$1,035 million	
b. Items used <u>primarily</u> for angling	\$759 million	
B. Estimated impacts on personal income (state level) in Oregon:		
1. Income associated with trip expenditures	\$253 million	
2. Income associated with equipment expenditures		
a. All items prorated to angling	\$779 million	
b. Items used <u>primarily</u> for angling	\$671 million	
4. Annual expenditures on angling licenses and tags in Oregon	\$11.3 million	(1990)

TABLE V-5
STATE LEVEL PERSONAL INCOME IMPACT
SELECTED RECREATIONAL FISHING ACTIVITIES

<u>Species/Water</u>	<u>\$ Per Angler Day</u>
Salmon	
Ocean	\$56.62
Bay/estuary	40.82
River/stream	29.13
Steelhead	
River/stream	29.54
Trout	
River/stream	27.14
Lake/reservoir	25.51
Warmwater species	
River/stream	42.12
Lake/reservoir	\$25.04

- Notes: 1. Only Oregon resident anglers are shown for purposes of this table.
2. Dollars per angler day are personal income impact at the state level.

Source: The Research Group. June 1991. Oregon Angler Survey and Economic Study. Final Report and Technical Supplement. Prepared for the Oregon Department of Fish and Wildlife. Corvallis, Oregon.

b. Commercial Fish Harvesting and Processing

Commercial fishing and processing are an important basic industry for Oregon's coastal and Columbia River communities. Trends in commercial fish landings are shown in Table V-6 and Figure V-2. Historically, the troll and gillnet salmon fisheries have been the most important commercial fisheries. In the late 1970's and early 1980's, fisheries for marine species such as groundfish and shrimp exceeded salmon in terms of volume and harvest level value. The harvest level value of the salmon fisheries recovered in the late 1980's, particularly in 1987 and 1988. Since 1990, however, the commercial salmon fisheries have been depressed again. The trends in commercial fisheries harvest level values are shown in Table V-6 and Figures V-2 and V-3. Salmon are significant to the multi-species, multi-gear commercial fishing fleet, because most of Oregon's licensed commercial vessels have typically been used in the salmon fisheries for at least some portion of the year. Over the last five years an average of 65 percent of commercial vessels licensed in Oregon have landed salmon in Oregon. A summary of uses related to commercial fishing is given in Table V-8.

Representative budgets from the fish harvesting sector and the fish processing sector, as well as price and cost for processing are used to estimate the impacts or contributions of commercial salmon fishing. The commercial fisheries data were developed by Hans Radtke and William Jensen in connection with a project to develop a fisheries economic assessment model for the West Coast Fisheries Development Foundation. An example of impact estimates for two species (chinook and coho) harvested by trolling is shown in Figure V-4. Assumptions

TABLE V-6 - OREGON COMMERCIAL SEAFOOD LANDINGS (Thousands of Round Pounds): 1969-1992

Year	Groundfish	Pink Shrimp	Crab	Salmon	Tuna	Other	Total
1969	23,244	10,268	9,784	10,932	29,828	1,490	85,546
1970	21,392	13,572	14,929	19,628	26,937	1,200	97,659
1971	22,040	9,075	14,876	17,268	13,092	1,036	77,387
1972	22,801	20,731	6,762	12,189	29,234	1,170	92,888
1973	21,944	24,517	2,350	17,385	24,425	917	91,538
1974	22,098	20,314	3,918	15,099	33,040	1,137	95,605
1975	21,024	24,084	4,027	12,390	23,584	937	86,046
1976	26,930	25,456	8,134	16,278	17,349	1,313	95,460
1977	23,366	48,580	19,902	10,774	9,899	1,835	114,357
1978	37,056	56,666	12,502	8,780	18,398	1,385	134,787
1979	64,430	29,587	15,634	11,129	8,821	2,267	131,868
1980	63,661	30,152	18,652	7,243	3,506	1,293	124,507
1981	82,502	25,924	6,984	7,041	7,727	18,047	148,224
1982	90,690	18,462	7,036	8,638	1,914	2,944	129,683
1983	78,152	6,547	5,368	2,673	3,411	4,211	100,361
1984	63,245	4,844	5,286	3,598	1,631	5,567	84,171
1985	64,694	14,855	7,518	6,577	1,525	4,435	99,603
1986	56,202	33,884	4,661	13,797	2,461	2,818	113,822
1987	68,409	44,589	5,991	15,092	2,288	2,243	138,612
1988	71,559	41,846	9,414	17,786	3,967	3,734	148,306
1989	82,510	49,129	11,676	11,724	1,080	9,504	165,623
1990	79,177	31,883	9,510	5,412	2,079	11,011	139,072
1991	110,817	21,711	4,924	5,344	1,259	5,976	150,031
1992	186,318	48,033	11,928	2,364	3,886	4,454	256,982

Source: Oregon Department of Fish & Wildlife

Notes: 1. Year 1991 and 1992 are preliminary.

2. In 1991, 38,076,797 pounds of groundfish was Pacific whiting, of which 8 million was landed and processed by a "mothership." In 1990, Pacific whiting landings totaled 5,058,341 pounds. In 1989, Pacific whiting landings totaled 195,914 pounds. Up to October in 1992, a total of 85 million pounds of Pacific whiting was processed on shore. A total of about 105 to 115 million pounds is expected to be processed on-shore in Oregon through 1992.

FIGURE V-2 - 1969-1992 OREGON COMMERCIAL SEAFOOD LANDINGS

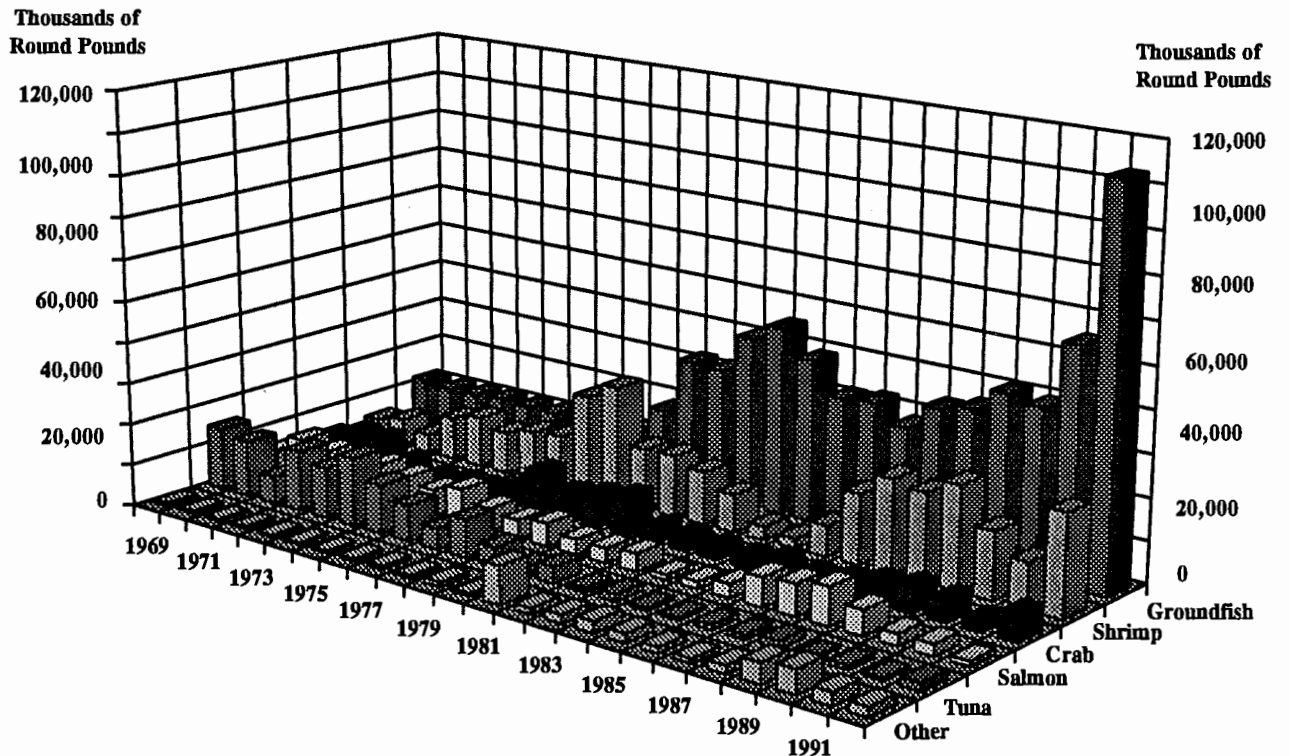


TABLE V-7 - 1969-1992 LANDED VALUE OF OREGON COMMERCIAL SEAFOOD
(Thousands of 1992 Real Dollars)

Year	Price Index	Groundfish		Shrimp		Crab		Salmon		Tuna		Other		Total	
		Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real	Nominal
1969	27.2	6,831	1,858	4,154	1,130	10,787	2,934	16,018	4,357	24,676	6,712	2,195	597	64,662	17,588
1970	28.8	5,573	1,605	5,656	1,629	12,958	3,732	31,750	9,144	24,042	6,924	708	204	80,688	23,238
1971	30.4	5,961	1,812	3,651	1,110	13,964	4,245	18,898	5,745	11,934	3,628	678	206	55,086	16,746
1972	31.9	6,790	2,166	8,997	2,870	8,984	2,866	20,100	6,412	28,639	9,136	652	208	74,163	23,658
1973	33.9	7,737	2,623	15,912	5,394	3,953	1,340	41,740	14,150	25,658	8,698	673	228	95,673	32,433
1974	36.9	8,764	3,234	11,978	4,420	7,482	2,761	28,539	10,531	34,068	12,571	534	197	91,366	33,714
1975	40.4	7,361	2,974	8,012	3,237	7,973	3,221	24,384	9,851	18,564	7,500	599	242	66,894	27,025
1976	43.0	10,005	4,302	11,840	5,091	12,298	5,288	45,019	19,358	13,165	5,661	1,088	468	93,414	40,168
1977	45.9	10,675	4,900	24,401	11,200	23,747	10,900	34,144	15,672	5,586	2,564	1,288	591	99,841	45,827
1978	49.5	16,214	8,026	30,109	14,904	19,392	9,599	23,659	11,711	20,848	10,320	840	416	111,063	54,976
1979	53.8	32,351	17,405	21,078	11,340	21,612	11,627	38,935	20,947	8,654	4,656	1,708	919	124,338	66,894
1980	58.9	19,696	11,601	28,324	16,683	21,010	12,375	17,883	10,533	4,662	2,746	1,056	622	92,632	54,560
1981	64.8	22,711	14,717	20,128	13,043	10,358	6,712	17,122	11,095	10,306	6,678	8,198	5,312	88,823	57,557
1982	68.9	29,488	20,317	13,482	9,289	10,959	7,551	18,019	12,415	1,837	1,266	1,991	1,372	75,776	52,210
1983	71.7	26,450	18,965	6,494	4,656	11,084	7,947	4,240	3,040	2,623	1,881	2,314	1,659	53,205	38,148
1984	74.8	21,436	16,034	2,872	2,148	10,580	7,914	6,856	5,128	1,183	885	3,016	2,256	45,943	34,365
1985	77.6	22,866	17,744	6,754	5,241	13,903	10,789	11,686	9,068	1,049	814	2,782	2,159	59,040	45,815
1986	79.6	23,368	18,601	22,745	18,105	8,276	6,588	19,084	15,191	1,156	920	2,917	2,322	77,546	61,727
1987	82.2	30,905	25,404	36,827	30,272	10,161	8,352	32,873	27,022	2,038	1,675	2,405	1,977	115,209	94,702
1988	85.0	29,231	24,846	20,176	17,150	13,267	11,277	45,968	39,073	3,914	3,327	2,545	2,163	115,101	97,837
1989	89.1	29,886	26,628	20,097	17,906	15,223	13,564	16,011	14,266	996	887	4,687	4,176	86,899	77,427
1990	92.8	26,208	24,321	16,842	15,629	15,684	14,555	10,329	9,585	1,800	1,670	6,180	5,735	77,042	71,494
1991	96.8	32,341	31,306	12,468	12,069	7,709	7,462	6,025	5,832	1,008	976	4,659	4,510	64,210	62,156
1992	100.0	32,851	32,851	17,187	17,187	13,408	13,408	3,687	3,687	3,956	3,956	3,185	3,185	74,274	74,274

Source: Oregon Department of Fish & Wildlife.

- Notes: 1. Adjustment used gross national product implicit price deflator developed by U.S. Bureau of Economic Analysis. (1992 is 100.)
 2. The ex-vessel nominal value of Pacific whiting is as follows: 1988 - \$41,183; 1989 - \$14,625; 1990 - \$274,586; 1991 - \$1,496,709; 1992 - \$5,044,786.
 3. Year 1991 and 1992 are preliminary.

FIGURE V-3 - 1969-1992 LANDED VALUE OF OREGON COMMERCIAL SEAFOOD

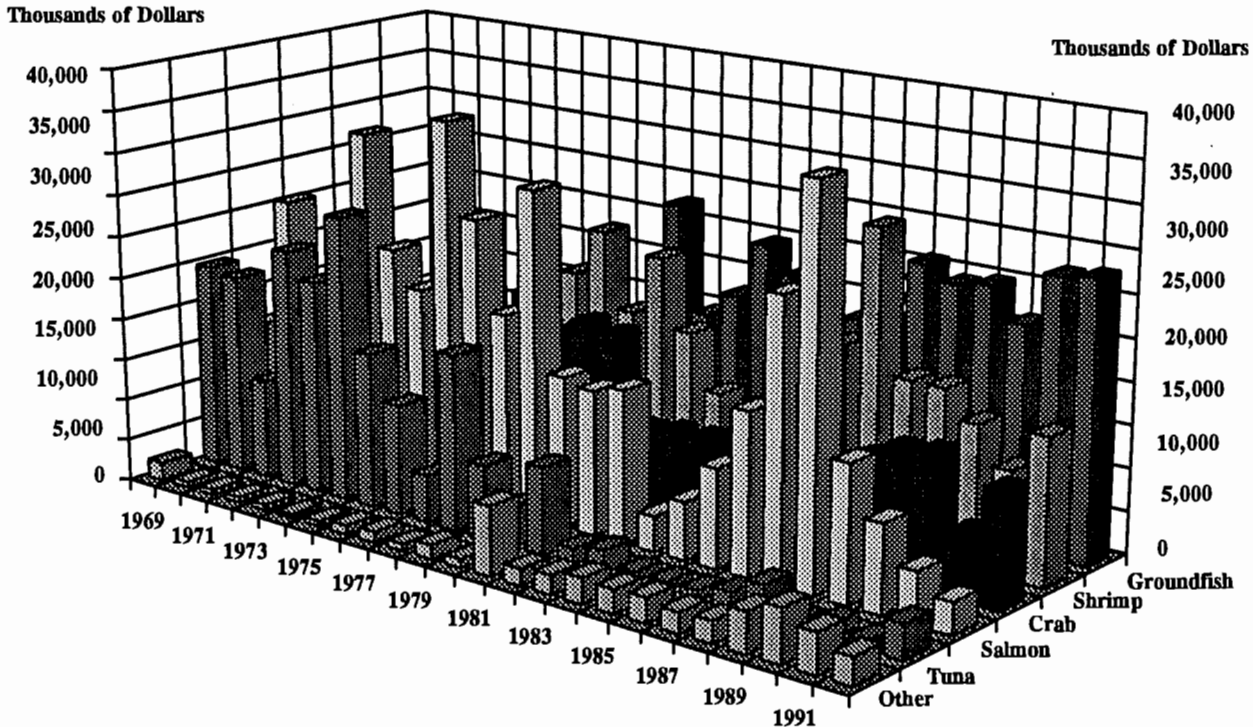


TABLE V-8
USES RELATED TO COMMERCIAL FISHING

1.	Number of licensed commercial fishermen	5,741	(1991)
2.	Number of licensed commercial fishing vessels	2,959	(1991)
3.	Number of commercial processing plants	43	(1990)
4.	Total pounds of fish landed in Oregon	148 million pounds	(87-91 average)
5.	Total value of fish at harvest level	\$80.7 million	(87-91 average)
6.	Total personal income (state level) from both the harvesting and processing of fish landed in Oregon.	\$194.6 million	(87-91 average)
7.	Total personal income (state level) for the commercial fishing industry, including the effect of income returned by Oregon fishermen from distant water fisheries.	\$276.5 million	(87-91 average)
8.	Annual revenues collected from the commercial fishing industry as license and landings fees.	\$2.0 million	(FY 92)

and estimates to derive personal income impacts for such specific examples are listed. Notice that landed price for troll caught salmon includes partial processing.

The total direct, indirect, and induced personal income contributions of commercial fishing industry activities (harvesting and processing) at the state level have been estimated (Radtke, 1992), and are shown in Table V-9 below.

TABLE V-9
PERSONAL INCOME IMPACTS (STATE LEVEL)
COMMERCIAL FISHING INDUSTRY

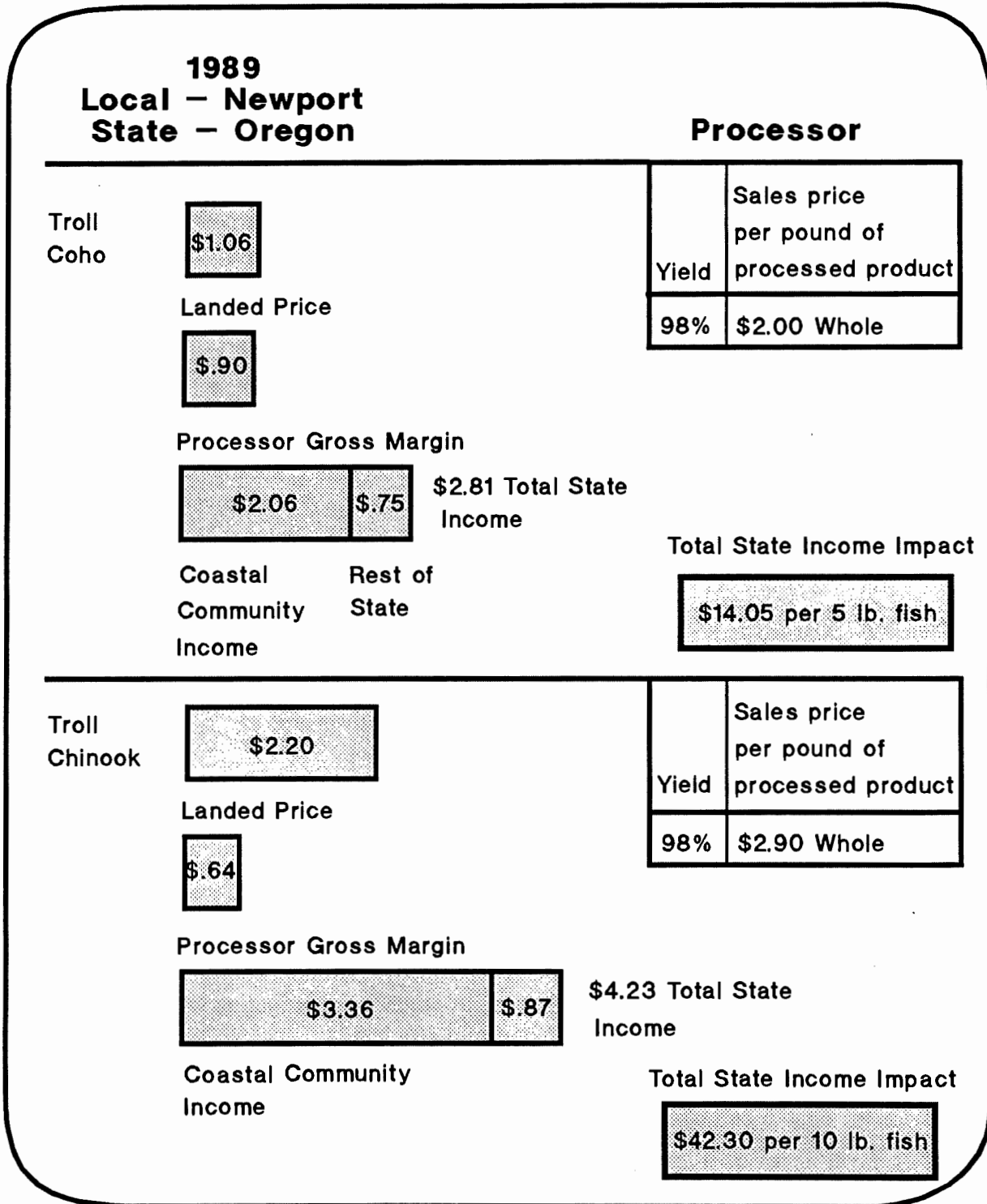
Source	1987	1988	1989	1990	1991	Average
Salmon	55.1	87.5	37.0	18.9	13.0	42.3
Other landed fish	196.3	151.7	149.6	142.3	121.7	152.3
Offshore and distant water fleet	77.0	75.1	74.3	100.0	83.0	81.9
Total impact	328.4	314.3	260.9	263.2	217.7	276.5

Notes: 1. Millions of dollars, not adjusted for inflation.

Source: Radtke, Hans and Shannon Davis. April 1992. 1992 Ocean Salmon Season Adopted Regulations: Estimated Economic Impacts on Oregon's Coastal Communities. Report prepared for Oregon Coastal Zone Management Association. Funded by Oregon Department of Fish and Wildlife.

In the coastal area, the personal income associated with commercial fish harvesting and processing represents approximately 15 percent of all coastal earned income.

FIGURE V-4
 LANDED PRICE, PROCESSOR MARGINS, SALES PRICE, AND
 ECONOMIC IMPACTS FOR TROLL CHINOOK AND COHO



E. Application of Economic Models Used to Evaluate Fishery Policies

The preceding discussion centers on a broad range of economic evaluation that may be used when addressing alternative use of fisheries resources. The purpose of the preceding discussions has been to suggest key considerations which should be made in any economic evaluation process.

1. Economic Benefits from Activities Related to Fish Resources

Oregon Department of Fish and Wildlife activities enhance and protect the environment required by fish and manage fish use. The use of fish resources, such as the ocean commercial harvest of salmon, creates jobs in Oregon's communities. Fish are also used by the public in their recreation pursuits in consumptive (taking home their catch), as well as in non-consumptive activities (viewing).

The use of fish resources (particularly for species which spend all or part of their lives in fresh water) is directly tied to the quantity and quality of water resources. Therefore, many of the benefits derived from ODFW activities are closely related to water use. Examples of benefits stemming from ODFW activities related to water use and water quality might include: improvement in human health; reductions in the water treatment costs for industrial water and agricultural uses; increases in sport and commercial fishery yields; improvements in water recreation opportunities; as well as increases in aesthetic values related water quality improvements.

2. Goals and Objectives

Probably the first consideration that needs to be made is that of the appropriate goals and objectives of resource use policy. Some examples of objectives are:

- Improving coastal community income and employment levels.
- Maximizing the net economic value of the resource (maximizing economic efficiency).
- Maintaining existing lifestyles and the character of coastal communities.

The appropriate model or gauge for determining success depends upon the objective or weighted combination of objectives chosen. The input-output model approach for assessing the effects of alternative policies on community income can be most helpful when the first objective is important. The NEV approach is appropriate in investigating whether or not investment in habitat improvements is economically efficient.

3. Relationship Between Recreational Fish Use and Commercial Fisheries

One of the most important things to understand concerns comparison of the estimates of economic impacts presented for commercial fishing to those for recreational fishing. The commercial estimates are for income impacts per fish. The recreational impacts are for income impact per recreational fishing day.

Historical data suggests that each recreationally harvested salmon "supports," on the average, roughly one day of recreational fishing. It is tempting to conclude that each additional recreational salmon caught in the ocean would produce a 1989 community income impact of \$56.62. Further, it is tempting to compare the income impact figures for a commercially harvested and processed salmon (\$42.30 per troll chinook; \$14.05 per troll coho). It would appear that a case for reallocation from commercial to sport can be made. Depending on the circumstances, this could be an incorrect inference.

For example, suppose a large "block" of salmon is reallocated from the commercial to the recreational fishery and at the same time the daily bag limit is increased to six fish. As a result of the increased bag limit, suppose the average catch per day increased to three (3) salmon. In effect, the income impact per average recreational salmon is reduced because fewer recreational days were "supported" per sport allocated fish. Such a reallocation scheme does not clearly produce improved coastal community income. If, on the other hand, it can be clearly shown that additional numbers of fish can be released to attract additional angler days, a case for reallocation between commercial and recreational groups may be supported.

This hypothetical example has some implications for the magnitude of resource changes and the structure of recreational regulations which may accompany it. It is the additional effort and resulting expenditures in the coastal communities which can produce positive and significant impacts. Several policy variables can influence the results:

- Total number of fish allocated to the recreational fishery. (Does the number exceed the amount which can be utilized under reasonable bag limits and season lengths?)
- Daily and weekly bag limits. (Will a one fish daily bag limit stimulate effort? Will a large bag limit "burn up" the total sport allocation without a proportional increase in angler use and tourism?)
- Timing of the fishery. (How does the recreational or commercial fishery fit into the local economy? Will any additional resource create additional demands on local infrastructure, such as roads, etc.?)

Good specific choices among alternatives for each policy variable could lead to longer recreational seasons, and give both the potential recreational "customer" and the supporting industry stability and the ability to plan ahead. These choices should also be made with some understanding of the likely reductions in commercial-related income. In this way a "balanced" set of regulations might increase overall community income and, at the same time, not impose undue hardships (losses of income) on the commercial sectors and dependent community. While any change in resource use will impact specific businesses, it is important to note that the general community economies dependent on these industries can be affected by these changes.

4. Winners and Losers

A major resource change will produce "winners" and "losers." Reallocation of resources from commercial to sport or from one geographic area to another will obviously result in reduced incomes to the commercial-related sectors or to one geographic area at the cost of another. Such a reallocation produces obvious results unless the allocation results in an "investment" that, in effect, produces a greater amount of fish for everyone. An example of this may be a reduction in a fishery that harvests a greater than is needed amount of fish needed for future propagation. In such cases the "losers" could be compensated by the "winners" and, in effect, everyone is better off.

Other potential losers are ports which are heavily oriented toward a specific fishery and lack the facilities to support any changes. The timing of seasons may favor some geographical areas over others. Recreational bag limits may promote one recreational mode (charter or private), but not the other. Any specific allocation alternative will have to be assessed within some of the "bounds" reviewed. This background paper can only be used as general guidance, not as a source of specific suggested values for all situations.

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APPENDICES

APPENDIX A.

**FISH DIVISION OTHER FUND
AND FEDERAL FUND
REVENUE SOURCE AMOUNTS
FOR THE 1991-93 BIENNIUM**

OTHER AND FEDERAL FUND REVENUE SOURCE
AMOUNTS FOR THE 1991-93 BIENNIUM

Other Funds

Hunting & Angling Licenses	51,141,422
Commercial Licenses	4,000,000
Commercial Fish Fund	1,266,000
CEDC	3,902
City of Portland	200,257
Confederate Tribes Umatilla	98,741
Coos County	98,120
Curry County	102,900
Douglas County	26,216
Eugene Water and Electric Board	81,483
Gov. Watershed Enhancement Board	14,448
Oregon YCC	76,433
Portland General Electric Co.	379,682
Pacific Power and Light	8,386
Port of Portland	197,595
Private Hatcheries	10,902
Fines & Forfeitures	280,000
Rents & Royalties	390,060
Interest Income	1,000,000
Carcass and Egg Income	1,600,000
Eel Lake Timber Sales	1,324,240
COID	175,102
Donations	1,308,673
Dept. of Environmental Quality	87,600
Dept. of Justice	210,000
Dept. of Revenue Penalties	121,587
Department of Water Resources	1,034,220
Indirect Income	8,520,564

Federal Funds

U.S. Department of Agriculture, Forest Service	1,695,006
U.S. Department of Defense, Corps of Engineers	10,424,513
U.S. Department of Energy Bonneville Power Administration	17,478,358
NW Power Planning Council	211,818
U.S. Department of Commerce, Anadromous Fish	1,053,375
Columbia River Fish Dev.	8,381,879
Interjurisdictional Fish Act	190,733
Marine Mammal Protection Act	165,000
Pacific Salmon Treaty Act	941,462
NMFS	3,340,894
USFWS	

Federal Funds (Cont.)

1991-93

U.S. Department of Interior	
Anadromous Fish	79,913
Wallop-Breaux (Dingell-Johnson)	15,643,040
Lower Snake Compensation Plan	3,294,863
Pittman-Robertson Act	5,265,508
Threatened and Endangered Act	109,500
Bureau of Reclamation	44,802
Misc. Federal	265,600
Pacific Fisheries Management Council	155,832
North Pacific Fisheries Management Council	47,470
Pacific States Marine Fisheries Commission	1,672,685

Notes: 1. Revenue source amounts may be split with other Department divisions.

APPENDIX B.

**OTHER FUND AND
FEDERAL FUND REVENUE
SOURCE DESCRIPTIONS**

OTHER FUND AND FEDERAL FUND REVENUE SOURCE DESCRIPTIONS

A. Restrictions on Uses of Selected Other Fund Revenue Sources

This is a brief summary of the important constraints on the use of specific types of revenues. In addition to these restrictions, certain funding from external Other Fund and Federal Fund sources must be matched at various percentage levels by commitments of state funding (e.g., sport license revenues or State General Funds).

Hunter and Angler License Revenues

Most of these revenues can be used to support a wide range of activities related to fish and wildlife management activities for the benefit of Oregon hunters and anglers. Policy and legislative guidance require that ODFW use revenues from anglers for fish-related purposes and from hunters for wildlife-related purposes. Both angler and hunter revenues are used to help support law enforcement and administration.

Two different kinds of license fee surcharges are in effect for anglers. Restoration and Enhancement Program surcharges are placed in a separate subaccount of the State Wildlife Fund and can be used only to fund fisheries restoration and enhancement projects. Surcharges established for the program to screen irrigation diversions are placed in a separate subaccount of the State Wildlife Fund and are used only to carry out the provisions of the screening legislation.

Halibut tag revenues are to be credited to the Halibut Research Account, which is a subaccount of the State Wildlife Fund. Moneys in this account may be expended only for halibut population studies and other research.

Commercial Fish Fund

The legislation which created the fund in 1991 tied new revenues to several specific uses for the 91-93 biennium only. The new revenues were expected to be generated from increased fees on commercial fishing industry licenses and a new landings fee system. Under the new system, landing fees are to be based on the value of the fish at landing, rather than the poundage of fish landed.

The Commercial Fish Fund was created separate and distinct from the State General Fund. Moneys received in the fund are to be used for the administration and enforcement of the commercial fishing laws, and for the management, propagation, research, habitat improvement and other activities that protect, maintain or enhance Oregon's food fish resource. Interest earned on moneys in the fund are credited to the fund.

Nonfederal Agreements and Contracts

Direct revenues from nonfederal agreements and contracts (e.g. Portland General Electric, Eugene Water and Electric Board) are to be used only for the specific purposes defined in the particular agreements. Indirect charges to cover ODFW administrative expenses are provided for in most contracts as a percentage of direct costs.

Interest Income

Interest income earned on wildlife fund balances has to remain in the fund and can not be diverted to the State General Fund. Half of the earnings are transferred to the Nongame Wildlife Fund to support the Nongame Wildlife Program (see the next section). For the period July 1, 1989 to June 30, 1995, the other half of the interest earnings must be transferred to the Fish Endowment Account. The Fish Endowment Account was created in the 1989 legislative session. Interest earnings, but not the principal in this endowment account, may be used for the maintenance of state funded fish hatcheries beginning in the 1995-97 biennium. (Also see the discussion under Eel Lake Timber sales, below.)

Carcass and Egg Income

Revenues from the sale of fish carcasses and eggs from hatcheries are recorded as Other Fund revenues. As part of the agreements with federal agencies, the revenues from federally funded hatcheries operated by ODFW must be used only to fund expenditures at the respective hatcheries.

Eel Lake Timber Sales

Revenues from timber sales on ODFW land near Eel Lake were received primarily during the 1989-91 biennium. During this period, one-half of such revenues were transferred to the Fish Endowment Account mentioned above.

Donations and Grants

Most donations and grants are received for specific purposes and are used accordingly.

Hydroelectric Fund

The Oregon Fish and Wildlife Hydroelectric Fund consists of moneys received by ODFW from hydroelectric application, permit or license fees. Most of the fees are transferred to ODFW from the Water Resources Department's Hydroelectric Fund. Interest on fund balances are credited to the fund. Moneys in the fund are to be used by ODFW only for activities related to hydroelectric projects, including administrative expenses.

Transfers In from Other State Agencies

Transfer in of revenues from other state agencies is prescribed in the budgets for both agencies. The uses of such revenues are usually controlled by budget directives or other legislation, which may apply for one or several biennia.

Lottery Proceeds

Lottery funds have been directed to ODFW by the legislature for purposes related to economic development (e.g., the Fish Restoration and Enhancement Program) specified each session in the legislation guiding the overall statewide usage of lottery revenues in the next biennium.

Civil Damages

In the specific case of civil damages received in settlements or judgments related to fish kills caused by pollution, ODFW policy is to use the funds to restore the populations of fish or habitat damaged by the pollution. If this is not possible, the funds may be used in the same region for mitigation projects.

B. List of Other Fund Revenue Categories

The Department of Fish and Wildlife receives Other Fund revenue from a wide variety of sources. The following is a list of Other Fund revenue categories based on the Executive Accounting System (EAS) revenue reporting system. Revenue categories are broken out by internal fund/subaccount classification.

<u>EAS Code</u>	<u>Title</u>	<u>Details</u>
WILDLIFE FUND/ WILDLIFE, FISH, ADMINISTRATION		
822.990	Forfeitures and	
822.990	Penalties or Fines	a/ criminal court fines; money which comes directly from the courts. b/ The Judicial Dept acts as an agent; collects monies from courts and distributes.
822.993	Civil Penalties	a/ civil cases initiated by ODFW. b/ civil cases turned over to Dept of Revenue for collection; collection charges are entered here.
829.407	Violation Fines	examples are civil damage suit settlements and recoveries such as those for Santa Fe pipeline, Hult Reservoir fish kills.

830.110	Interest	interest earnings on Wildlife fund balances; also recorded under Fish Endowment Fund, Nongame Fund, Commercial Fish Fund and Hydro Fund.
830.210	Land Lease	examples - annual ODFW leases to Siskiyou National Forest (trailer pad), and acreage to DWAVE Cattle (188 acres on Bennett Track in Dayville).
830.336	Office Rental	all parking at ODFW headquarters building; fees from rental of space at ODFW building.
833.629	Residential Rentals	ODFW rental houses for hatcheries and wildlife management areas (Other/General Fund).
840.108	Private Hatcheries - Fees	Fees paid by private hatcheries for annual wholesale fish dealer licenses, private salmon hatchery permits, poundage fees and R&E surcharge on poundage fees.
840.127	Public Voucher Direct	Direct charges on nonfederal contracts: CEDC, City of Portland, Confederated Tribes of the Umatilla, Coos County, Curry County, Douglas County, EWEB, Governor's Watershed Enhancement Board, Oregon YCC, PGE, PP&L, Port of Portland, etc.
840.128	Public Voucher Indirect	Indirect charges on nonfederal contracts.
840.129	Private Hatcheries Direct	Revenues from billings for services provided to private hatcheries under contract.
840.131	Private Hatcheries Indirect	Indirect charges on private hatchery contracts.
840.133	Fish Carcass/Egg Income	Carcass & egg sale revenues for hatcheries.
840.134	Grazing/Farming/Hay Income	Charges for hay and grazing livestock, based on number of animals and length of time grazing takes place.
840.137	Hunter/Angler License/Tag Sales	Revenues from sales of hunting and fishing licenses, waterfowl stamps sold by license agents, upland bird stamps, Sauvie Island parking permits, pheasant tags, occupational licenses (e.g.

trapping). Revenues from surcharges on angling licenses are transferred to the Restoration and Enhancement Fund (see below).

840.138 Commercial Fish License/Fees Revenues from sales of commercial fishing industry licenses. Posted to Fund 529 through 89-91, followed by 100 percent transfer out to the General Fund through September, 1991. After September, 1991 the revenues will initially be posted under the Commercial Fish Fund (CFF), with 75 percent being transferred out to the General Fund. (The portion retained in the CFF will be recorded under EAS code 840.142.) A small portion of the revenues are surcharges on troll salmon and gillnet salmon limited entry permits. These surcharge revenues are transferred to the Restoration and Enhancement Fund (Fund 521).

840.139 Commercial Poundage Fees Revenues from poundage fees paid by commercial fish dealers. Posted to Fund 529 through 89-91, followed by 100 percent transfer out to the General Fund through September, 1991. Between October, 1991 through December, 1991 the revenues will be posted under the Commercial Fish Fund with 75 percent being transferred out to the General Fund and 25 percent being retained in the CFF. There is also a surcharge on the poundage fees for salmon which is transferred to the Restoration and Enhancement Fund . Beginning on January 1, 1992, the poundage fee will be replaced by an ad valorem landings fee, except for the poundage fee surcharge (\$0.05/lb.) on salmon. The ad valorem landings fee revenues will be posted under the CFF revenue code 840.143. The portion to be transferred to the General Fund will be 75 percent, with 25 percent to be retained in the CFF under code 840.144.

840.141 Timber Sales Revenues are mostly from Eel Lake timber sales, with minor amounts from several other areas. For the period 7/01/89 to 6/30/91 half of the Eel Lake timber sale revenues were subsequently transferred to the Fish Endowment Fund (Fund 523).

840.210	Donations & Contributions	Donations received from memorials, and any money received and giving nothing in return.
860.310	Sale of Lands	Revenues from sales of land or real estate, e.g., revenues from sale of old building on Mill Street.
860.330	Sale of Other Surplus Equipment	Revenues from surplus equipment sales.
861.xxx	Transfers in from Other Departments	Transfer in of revenues from other state agencies, usually prescribed in the budgets for both agencies. (See the following two items for continuing sources of revenues from court fines.)
861.150	Transfer in from Department of Revenue	Transfer in of revenues received from payment of court fines received by the Department of Revenue from justice courts which are by law required to be deposited in the State Wildlife Fund.
861.198	Transfer in from Judicial Department	Transfer in of revenues from payment of court fines received by district courts which are by law required to be deposited in the State Wildlife Fund.
861.500	Transfer in Indirect Cost	Indirect charges on federal contracts transferred in from federal funds.
870.500	Transfer Out - Intrafund	Internal intrafund transfers out.
871.xxx	Transfer Out to Other Departments	Transfer out to other state agencies, prescribed in the budgets for both agencies.
872.000	Transfer to General Fund	Transfer out to the State General Fund of revenues, such as commercial fishing industry fees, which are prescribed by law to accrue to the General Fund after collection by ODFW.
880.013	Miscellaneous Revenue - Misc.	Miscellaneous revenues from other sources. Examples include mailings and computer lists, maps, fish food pellet machines, witness fees, sale of horses, watchable wildlife merchandise, publications such as viewing guides, etc.
880.618	Sale Certificate-Participation	Revenues from sales of certificates of participation. To date the only use of COP's was

to fund purchase of the current headquarters building.

RESTORATION AND ENHANCEMENT FUND

- 841.137 Recreational License Surcharge Revenues from surcharges on angling licenses beginning in calendar year 1990. Amounts vary by license type. Revenues are used exclusively to support the Fish Restoration and Enhancement Program.
- 841.138 Commercial License Surcharge Revenues from surcharges on commercial troll (\$65) and gillnet (\$74) salmon fishing permits beginning in calendar year 1990. Revenues are used to support the Fish Restoration and Enhancement Program.
- 841.139 Poundage Fees Surcharge A fee of \$0.05 per pound round weight is collected as a surcharge for the R&E Program.

COMMERCIAL FISH FUND

- 830.110 Interest Interest earnings on Commercial Fish Fund balances.
- 840.138 Commercial Fish License/
Fees Initial posting of commercial fishing industry license fee revenues after September, 1991. Portion of commercial fishing license fees earmarked for transfer to the General Fund (75 percent of the amount net of R&E surcharges) prior to transfer to 872.000.
- 840.142 Commercial Fish License
Fees That portion of commercial license fees earmarked for retention in the Commercial Fish Fund (25 percent of the amount net of R&E surcharges).
- 840.143 Commercial Landing Fees Initial posting of commercial fishing industry landing fee revenues after September, 1991. Portion of commercial fishing landing fees earmarked for transfer to the General Fund (75 percent of the amount net of the R&E salmon poundage surcharge) prior to transfer to 872.000.

840.144	Commercial Landing Fees	That portion of commercial landing fees earmarked for retention in the Commercial Fish Fund (25 percent of the amount net of the R&E salmon poundage surcharge).
840.145	Commercial Fishing Fines	Revenues from fines related to commercial fishing law violations and from confiscated fish taken in violation of commercial fishing regulations.
872.000	Transfer To General Fund	Total commercial fishing industry revenues transferred to the State General Fund.

FISH ENDOWMENT FUND

830.110	Interest	Revenues from the other 50 percent of interest earned on Wildlife Fund balances.
840.141	Timber Sales	Revenues from the Eel Lake timber sale.

HYDROELECTRIC FUND

830.110	Interest	Interest income on Hydro Fund balances.
861.690	Department of Water Resources	That portion of Hydro Fund revenues (collected by the Water Resources Department) transferred in to fund appropriate programs in ODFW.

LOTTERY FUND

864.000	Lottery Proceed	Revenues authorized in the budget from lottery revenues. (Fish Restoration and Enhancement Program)
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CAPITAL IMPROVEMENT OTHER FUND

860.500	Transfer in - Intrafund	Internal account used to transfer funds from other internal sources for capital improvement expenditures.
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C. Federal Fund Descriptions

Mitchell Act Funds

The funds are used for operation and maintenance of the Columbia River mitigation hatcheries, the northeast Oregon screening maintenance activities, and other fishway maintenance. Funding for the period October 1, 1991 to September 30, 1992 has been awarded to the exact amount awarded the previous year (\$3,778,841) and was contingent upon the FY 92 funds appropriated by Congress, although to date only \$298,000 has been made available for reimbursement.

Pacific Salmon Treaty Act Funds

These funds are used to provide administrative, management, and applied research support to the Pacific Salmon Commission in accordance to the U.S./Canada Pacific Salmon Treaty. The projects consist of personnel to provide the technical and coordination support for all PSC activities in Oregon, stock identification, sampling of various populations of salmon and the data services needed to gather and organize the material for necessary reports to support the PSC technical needs.

Anadromous Fish Conservation Act

These funds are used to conduct monitoring and stock assessment activities jointly with the State of Washington in managing the Pacific Coast salmon stocks. This information provides the federal government with the real time fishery catch data and stock assessment information for federal management of the salmon fishery under the Magnuson Fishery Conservation and Management Act.

Interjurisdictional Fisheries Act

The funds are used for collecting and providing assessment information to PSMFC and ODFW management for use in managing Oregon's west coast groundfish fishery and shrimp fishery. The funds for these projects have been allocated by Congress, but as of this date have not been awarded by NOAA. The amount for the two projects to operate for the time period January 1, 1992 to December 31, 1992 is a total of \$144,936 federal dollars, and will be matched with \$48,312 State dollars.

Endangered Species Act

These funds are being used to gather additional information on the salmon populations and their habitat in Oregon. During the five years of this project, we will determine the number, distribution, and hatchery proportion of naturally spawning coho salmon and the distribution and abundance of juvenile coho salmon in lower Columbia River tributaries and also of the naturally spawning spring chinook and juvenile spring chinook in Oregon's

portion of the Snake River Basin. Funding for this year has not yet been awarded by NOAA/NMFS, but our request for this year's funding is \$233,302.

Marine Mammal Populations Assessment

These funds are used for the population assessment of Oregon's pinnipeds in determining population status and trends for coastal marine resource management programs. The amount Oregon has received for funding period July 1, 1991 through June 30, 1992 is \$35,600 and is matched with \$35,600 of State funds.

Marine Mammal Protection Act (Observer)

These funds are dollars that come from NMFS through PSMFC to Washington and Oregon. Oregon's share for this year is \$148,848 and is used to fund the Columbia River Commercial Salmon Gillnet Fishery Observation project.

Regional Fishery Councils

As a voting member of North Pacific Fishery Management Council and Pacific Fishery Management Council, ODFW is allocated through each Council funds to support the Councils in the administrative and technical support functions. Funding for this CY 92 amounts to \$42,161 from PFMC and \$25,000 from NPFMC.

PacFIN

With these funds that come through PSMFC from NMFS we fund the collection and processing of groundfish landing receipts, the groundfish sampling and collection of biological and area catch, the groundfish aging analysis work, and the software development project to enhance ODFW's PacFIN subsystem to meet the specifications and needs of the redefined research database. The total amount requested for February 1, 1992 through January 31, 1993 is \$389,598.

APPENDIX C.

**DEFINITION OF
ECONOMIC TERMS**

DEFINITION OF ECONOMIC TERMS

Consumer Surplus - The difference between the maximum a consumer would be willing to pay for his current consumption for a good or service and the amount he actually pays.

Ex-Vessel Price - The price that a harvester receives for the fish harvested at the point of landing.

Input/Output Analysis - A technique for analyzing the interdependence of producing and consuming sectors in an economy.

NEV - Net economic value used in economic valuation in National Economic Development accounts (NED's).

Option Value - A willingness to pay for the option of future use, when future use is uncertain. Different versions may also be called existence value or bequest value.

Personal Income Impact - The amount of income generated by an activity. Includes both the direct wages, profits, and salaries (e.g. crew shares, boat owners' profits, processing labor); the indirect income generated (e.g. wages, salaries, and profits of boat repair shops); and induced income generated (e.g. wages, salaries, and profits of the local grocery store).

Processor Margin - The amount between the price the processor pays for fish at the harvester and the sales price of the processed product (ex-processor price).

RED's - Regional Economic Development accounts. Local or regional economic impacts on jobs and income associated with any specific expenditures in a chosen area of interest.

Round Weight Equivalent - Some fish are landed in the round, others semi-processed. Round weight equivalent equates weights and prices to unprocessed states.

Yield - The amount of recovery of finished product after processing takes place.

APPENDIX D.

**HATCHERY
CHARACTERISTICS**

HATCHERY CHARACTERISTICS

The following narrative discusses individual hatchery facilities and recent production. The discussion is organized by major funding source (federal, state, mixed federal and state, and utility) and regions within the source categories.

1. Federally-Funded Hatcheries

a. Columbia Region

(1) Big Creek Hatchery

The Fish Commission began construction on this hatchery in 1939, and it was expanded and remodeled in 1952-53 under the Lower Columbia River Rehabilitation Program. The hatchery is located two miles south of Knappa off Highway 20, on 48 acres of Oregon Department of Fish and Wildlife (ODFW) land. Water for the ponds and raceways is supplied by the Big and Mill Creeks, and two springs. In 1990, the facility produced 14,354,477 fall chinook, 719,225 coho, 126, 819 winter steelhead, and 9,391 searun cutthroat trout. The hatchery is currently 100 percent funded by the National Marine Fisheries Service (NMFS), and supports a staff of six full-year and several seasonal employees. The 1991-93 biennium budget for the facility is \$866,551.

(2) Bonneville Hatchery

Original construction of this facility by the Fish Commission began in 1909, and it has undergone several reconstructions over the years. The hatchery was included in the Columbia River Fisheries Development Program (CRFDP) in 1954 to compensate for the loss of salmon spawning grounds due to the construction of the John Day and Bonneville Dams. Located three miles west of Cascade Locks off of Interstate 84 (Exit 40), the facility sits on 206 acres within the Bonneville Dam Complex. The ODFW leases 200 acres of land on both sides of Tanner Creek from the Oregon Division of State Lands. During 1990, the hatchery released 25,790,500 fall chinook, 4,231,144 coho, 588,397 spring chinook, 381,096 summer steelhead, and 2,506 white sturgeon. The hatchery is currently funded 55 percent by the NMFS, and 45 percent by the Army Corps of Engineers (COE), with a 1991-93 biennium budget of \$2,157,049.

(3) Cascade Hatchery

This hatchery was built in 1958 as part of the Columbia River Fishery Development Program, and is meant to provide supplemental production of coho and fall chinook for Bonneville's Columbia program. The facility is located on 3.8 acres of U.S. Forest Service land 1.5 miles west of Cascade Locks off of Interstate 84 (Exit 41). The water supply intake is located on Eagle Creek, one half a mile upstream from the hatchery. Nearly 4.2 million coho fry were

released from the facility in 1990. Cascade Hatchery is 100 percent funded by the NMFS, and employs five full-year and three seasonal staff. The 1991-93 biennium budget is \$695,096.

(4) Gnat Creek Hatchery

This hatchery was constructed in 1960 as part of the CRFDP to supply migrant-sized steelhead for the Columbia River Basin fisheries, which were adversely affected by water development projects in the area. The facility is located 28 miles east of Astoria on Highway 30, on 15.3 acres of ODFW land. Water for the raceways is taken from Gnat Creek and a small side creek. There were 770,633 steelhead and 1,802 searun cutthroat trout released from the hatchery in 1990. Coho fry have also been hatched at the facility in the past. The facility is fully funded by the NMFS, and is staffed by four full-year and several seasonal employees. The 1991-93 biennium budget for this facility is \$547,115.

(5) Klaskanine Hatchery

This hatchery was originally built in 1913, and was expanded and remodeled in 1952 under the Lower Columbia Rehabilitation Program. It is located 21 miles southeast of Astoria on Highway 22, on 16.6 acres of ODFW land. The Hatchery takes its water from the North Fork Klaskanine. During 1990, the facility released 60,086 winter steelhead, 1,394,555 coho and 2,625,730 fall chinook. The NMFS fully funds the hatchery, which employs four full-year and several seasonal staff. The 1991-93 biennium budget for the facility is \$578,565.

(6) Oxbow Hatchery

The original hatchery was built in 1913 to provide additional rearing facilities for the Bonneville hatchery. Construction of the Bonneville Dam flooded the site, and a new hatchery was built nearby in 1937. That facility was expanded and remodeled in 1952 under the CRFDP. The present facility is located one mile east of Cascade Locks off of Interstate 84, on 33.3 acres of ODFW land. Oxbow Springs, Herman Creek and Wahkeena Creek supply the water for Oxbow Hatchery and the adjoining Herman Creek and Wahkeena Ponds. In 1990, the facility released 5,198,083 coho and 1,494,030 spring chinook fry. The hatchery is fully funded by the NMFS with a 1991-93 biennium budget of \$583,172.

(7) Sandy Hatchery

This hatchery was built on 1951 at its present site on Cedar Creek, about one-half mile before the creek enters the Sandy River. The hatchery was included in the CRFDP in 1951 to produce additional fish for the Sandy River runs, and to aid in rehabilitating the runs in the Sandy River and tributaries upstream from Marmot Dam. The facility is located 1.5 miles north of Sandy, Oregon, off Highway 26, on 12.3 acres of ODFW land. Cedar Creek supplies the water for the hatchery. During 1990, this facility produced 45,000 rainbow, cutthroat, and brook trout and 961,806 coho for area fisheries. This hatchery is fully funded by the NMFS with a 1991-93 biennium budget of \$462,643.

b. Northwest Region

(1) Leaburg Hatchery

This hatchery was built in 1953 by the COE for mitigation of lost rainbow trout habitat due to construction of the Blue River and Cougar dams. It is located four miles east of Leaburg Oregon on Highway 126, at river mile 38.8 of the McKenzie River, on 21.6 acres of COE land. The McKenzie River supplies water to the facility. In 1990, the hatchery produced 835,248 rainbow and cutthroat trout and 196,087 summer steelhead for area fisheries. This facility is 100 percent funded by the COE, employs seven full-year and two seasonal workers, and has a 1991-93 biennium budget of \$1,250,197.

c. Northeast Region

(1) Umatilla Hatchery

In 1986, a co-management effort between ODFW, the Confederated Tribes of the Umatilla Indian Reservation and other fishery agencies developed a comprehensive plan for rehabilitation of anadromous stocks in the Umatilla River Basin as partial mitigation for losses caused by the Federal Columbia River Hydropower System. Construction of the Umatilla Hatchery by the COE began in 1990, and operation began in 1992. The facility is located 3.5 miles west of Irrigon and adjacent to the Columbia River. Water is supplied to the hatchery through four remote wells. The facility is 100 percent federally funded, and it is operated by the ODFW, with a 1991-93 biennium budget of \$2,074,642, which includes some construction funds.

(2) Irrigon Hatchery

Construction began on this hatchery in 1982 by the COE. Operation of the facility is part of the Lower Snake River Comprehensive Plan to enhance summer steelhead runs in the Grande Ronde and Imnaha River systems. The facility is located on 35 acres of COE land, three miles west of Irrigon and adjacent to the Columbia River. This hatchery does not have fish returning directly to it, but takes eyed eggs from other area hatcheries for incubation and rearing. During 1990, the facility produced 182,537 rainbow trout, 1,887,923 summer steelhead, and 3,433,949 chinook. The hatchery is 100 percent federally funded, with a 1991-93 biennium budget of \$1,466,581.

(3) Lookingglass Hatchery

This facility was constructed in 1980-81 at a cost of \$5,315,000. The purpose of the facility is to produce spring chinook for the Imnaha and Grande Ronde Rivers as part of the Lower Snake River Compensation Package. The hatchery is located on 22.5 acres of U.S. Fish and Wildlife Service (USFWS) land on Lookingglass Creek, 20 miles north of Elgin on Palmer Valley Road. Lookingglass Creek supplies the water for the facility. The hatchery produced 1,107,901 chinook in 1990. Four full-year and two seasonal employees work at this federally-funded hatchery. The 1991-93 biennium budget for the facility is \$941,236.

d. Southwest Region

(1) Cole Rivers Hatchery

The hatchery was constructed in 1972 by the COE to mitigate for spawning and rearing areas blocked by the construction of Lost Creek, Applegate, and Elk Creek Dams. It is located on 58 acres of Corps of Engineers land on the Rogue River, 30 miles northeast of Medford on Highway 62, about 1/2 mile downstream of Lost Creek Dam. 1990 production of the facility includes 571,797 winter and summer steelhead, 454,841 rainbow trout, 407,840 coho, and 1,965,236 spring chinook. Presently, the hatchery is 100 percent funded by the COE, with a 1991-93 biennium budget of \$2,116,637.

2. State-Funded Hatcheries

a. Columbia Region

(1) Cedar Creek Hatchery

This hatchery was built in 1923 to enhance chinook, coho, steelhead and trout populations in various coastal streams. It is located on Cedar Creek, a tributary of Three Rivers, 1.5 miles east of Hebo off Highway 22, on 35.3 acres of state-owned land. Cedar Creek and Three Rivers supply the water for the facility. During 1990, the hatchery produced 265,987 chinook, 491,611 steelhead, and 160,923 searun cutthroat trout for area populations. This facility is funded 50 percent from the General Fund and 50 percent from the Wildlife Fund, with a 1991-93 biennium budget of \$760,960.

(2) Nehalem Hatchery

This facility was built in 1965 to replace the Foley Creek Hatchery, which was originally built in 1926. The purpose of this hatchery is to enhance coho, fall chinook, coastal cutthroat trout, and winter steelhead populations for various coastal systems and STEP programs. The facility is located on the North Nehalem River, 12 miles east of Nehalem on Highway 58, on 26.2 acres of state land. The North Nehalem River supplies water for the hatchery. During 1990, 16,867 searun cutthroat trout, 211,217 winter steelhead, and 948,111 coho were released from the facility. The hatchery employs four full-year staff and is 100 percent funded from the State General Fund. The 1991-93 biennium budget is \$568,236.

(3) Trask Hatchery

This hatchery was constructed in 1914 to replace a nearby facility which was built in 1906. It is located on the Trask River six miles east of Tillamook on Highway 6. The associated Trask Pond facility, established in 1970, is located on 32.9 acres of leased Oregon State Forestry land on the East Fork Trask River, 16 miles east of Tillamook on Trask River County Road. These facilities were built to enhance coho, chinook and winter steelhead populations in

various coastal systems and STEP programs. The facilities released 1,680,648 coho, 358,734 spring chinook, and 215,629 fall chinook during 1990. Funding for the Trask Hatchery and associated ponds is provided 50 percent from the General Fund and 50 percent from the Wildlife Fund. The 1991-93 biennium budget for the facilities is \$688,658.

b. Northwest Region

(1) Alsea Hatchery

This facility was built in 1934 to enhance winter steelhead and searun cutthroat trout populations in various coastal streams for angler use. The hatchery is located on 25 acres of state land on the North Fork Alsea River off Highway 34, 15 miles east of Philomath. The North Fork Alsea River provides water for the hatchery. The facility released 192,377 winter steelhead and 1,247,151 cutthroat trout during 1990. Hatchery funding sources are the General Fund (24 percent) and the Wildlife Fund (76 percent). The 1991-93 biennium budget is \$618,660.

(2) Fall Creek Hatchery

This hatchery was built in 1952 to enhance coho and fall chinook populations in the Alsea River system. It is located on 31 acres of state land on Fall Creek, a tributary of the Alsea River, 29 miles east of Waldport off Highway 34. Fall Creek, Carnes Creek and a small spring provide water for the facility. In 1990, 1,618,102 coho and 124,990 fall chinook were produced at the hatchery. This facility is staffed by two full-year and several seasonal employees. Full funding is provided by the General Fund, with a 1991-93 biennium budget of \$459,484.

(3) Roaring River Hatchery

This facility was built in 1924. It is located 18 miles northeast of Albany on 30 acres of state-owned land. The Roaring River provides water to the facility. During 1990, the hatchery released 1,270,100 rainbow trout, 198,575 summer steelhead, 75,440 winter steelhead and 5,426 white sturgeon. This facility is funded 50 percent from the state General Fund and 50 percent from state dedicated funds. The hatchery employs eight full-year and several seasonal staff, and has a 1991-93 biennium budget of \$527,458.

(4) Salmon River Hatchery

The Salmon River Hatchery was built in 1975 to enhance coho, fall chinook, and summer steelhead populations in the Salmon and Siletz River systems. It is located on the Salmon River, four miles north of Lincoln City, off Highway 18, on 23.7 acres of land. Water is pumped from the Salmon River to supply this facility. During 1990, the hatchery produced 138,908 summer steelhead, 1,467,235 coho and 211,483 fall chinook. The facility is funded 50 percent from the General Fund and 50 percent from the Wildlife Fund, and employs four full-year and several seasonal staff. The 1991-93 biennium budget is \$630,966.

c. Central Region

(1) Fall River Hatchery

This facility was built in 1929 to provide rainbow trout for sport fisheries in the central, northeast and southeast regions. The hatchery also provides brook, rainbow and cutthroat trout fingerlings for air stocking programs throughout Oregon, and trout and kokanee eggs for other hatchery programs. The facility is located off of South Century Drive about 25 miles south of Bend. During 1990, the hatchery produced 725,786 rainbow, 13,494 cutthroat, and 209,349 brook trout. The hatchery is funded 50 percent from the General Fund and 50 percent from the Wildlife Fund, with a 1991-93 biennium budget of \$302,274.

(2) Klamath Hatchery

This facility was originally built in 1924 to provide rainbow, cutthroat and brown trout and coho for the Klamath Basin and Lakeview areas. It is located eight miles west of Chiloquin, just off Highway 62. The water supply for the facility comes from five nearby springs. In 1990, the hatchery produced 2,393,005 rainbow, 56,961 cutthroat, 41,753 brook and 7,052 brown trout, and 3,074 kokanee for area populations. Funding for the facility comes 50 percent from the General Fund and 50 percent from the Wildlife Fund. The hatchery has four full-year and one seasonal position, with a 1991-93 biennium budget of \$427,438.

(3) Oak Springs Hatchery

This facility was constructed in several phases beginning in 1922, with the last major construction taking place in 1969. Its purpose is to provide rainbow trout and summer steelhead for anglers and summer steelhead for tribal fisheries. It is located two miles off Highway 197, halfway between Maupin and Tygh Valley, on the Deschutes River. Water for the facility comes from three local springs. 1990 production for the hatchery was 1,699,672 rainbow trout and 695,218 summer steelhead. The hatchery is funded half from the General Fund and half from the Wildlife Fund, with a 1991-93 biennium budget of \$768,082.

(4) Wizard Falls Hatchery

This hatchery was built in 1947 on 38 acres of U.S. Forest Service Land to provide trout for sports fisheries in the state. It is located on the Metolius River near Camp Sherman about 20 miles west of Sisters, Oregon. Water for the facility is provided by several area springs. In 1990, the hatchery produced 1,972,065 rainbow, 404,791 brook, 167,537 brown, and 62,123 cutthroat trout, 406,166 kokanee, and 12,190 Atlantic salmon. The hatchery is funded solely from the General Fund, with a 1991-93 biennium budget of \$481,994.

d. Southwest Region

(1) Bandon Hatchery

This hatchery was built in 1925 on 16 acres which was purchased by the state from a private party for \$1.00, with the provision that if the hatchery was not used for fish culture purposes for a period of two years, the property would revert back to the heirs of the original owners. It is located about one mile east of the coastal town of Bandon, just off Highway 42S. During 1990, the facility produced 215,131 winter steelhead, 538,711 Coho and 251,100 fall chinook. Funding for the hatchery is provided from the General Fund (50 percent) and the Wildlife Fund (50 percent). The 1991-93 biennium budget is \$284,764.

(2) Butte Falls Hatchery

Construction of this facility began in 1915, and the site was originally shared by the Oregon Game Commission and the USFWS. In 1945, the USFWS deeded their portion of the facility to the Game Commission, and from then until 1972, this was the only public hatchery on the Rogue River system. The facility is located on 14.6 acres, 35 miles northeast of Medford off of Highway 62 on the Butte Falls Highway. Big Butte Creek provides the water supply for the hatchery. 1990 release of juvenile fish from the hatchery consisted of 655,882 rainbow trout, 444,786 coho, 32,500 spring chinook, and 484,119 fall chinook. The hatchery is funded 50 percent from the General Fund and 50 percent from the Wildlife Fund, with a 1991-93 biennium budget of \$398,138.

(3) Elk River Hatchery

Construction of this facility was completed in 1968 with the goal of supplementing natural production of fall chinook in the Elk and Chetco Rivers, and winter steelhead in the Chetco River. Recent changes in programs include enhancement of salmon populations in the Pistol and Winchuck Rivers and in Euchre Creek. The hatchery is located on 13.2 acres of ODFW land 7.5 miles upriver from Highway 101, just northeast of Port Orford. Water for the facility comes from the Elk River. During 1990, the hatchery released 900,059 fall chinook and 63,658 winter steelhead. Current funding sources for the Elk River Hatchery are the General Fund (50 percent) and the Wildlife Fund (50 percent). The hatchery employs four full-year and one seasonal staff, with a 1991-93 biennium budget of \$566,702.

(4) Rock Creek Hatchery

Construction of the original hatchery began in 1920 and has undergone several reconstructions over the years. The purpose of the facility is to enhance chinook, coho, steelhead and rainbow trout populations for the Umpqua River and STEP programs. The hatchery is located on 26.5 acres of state land on the North Umpqua River, 23 miles east of Roseburg, off Highway 138. Water is supplied to the facility from Rock Creek, North Umpqua River and a local spring. In 1990, the hatchery produced and released 75,586 rainbow trout, 152,267 summer steelhead, 56,159 winter steelhead, 285,928 coho, and 211,483 fall chinook. The hatchery is funded by

58 percent General Funds, 38 percent Wildlife Funds and 4 percent Douglas County funds. The 1991-93 biennium budget for the facility is \$709,213.

3. Mixed State and Federal Funded Hatcheries

a. Columbia Region

(1) Clackamas Hatchery

The hatchery was constructed in 1979, and expanded in 1986 to enhance spring chinook and winter steelhead populations in the Clackamas and Sandy Rivers. The facility is located on the Clackamas River in McIver State Park, six miles southeast of Estacada. The Clackamas River is the primary water supply for the facility. In 1990, the hatchery released 70,320 winter steelhead and 1,558,712 spring chinook. Funding is provided by the state General Fund (29.6 percent), the Columbia River Fisheries Development Program under the NMFS (29.6 percent), Portland General Electric (22.0 percent), and the City of Portland (18.8 percent). The 1991-93 biennium budget for the facility is \$907,271.

b. Northwest Region

(1) Marion Forks Hatchery

Construction of this hatchery began in 1948, funded by the COE (83.7 percent) and the State General Fund (16.3 percent). It was built as mitigation for the loss of spawning grounds for spring chinook and winter steelhead due to the construction of the Detroit and Big Cliff Dams. The facility is located on 15 acres of Willamette National Forest land along Highway 22, 15 miles east of Detroit, Oregon. Water for the hatchery is supplied by the Marion and Horn Creeks. 1990 production of the facility includes 37,990 cutthroat trout, 133,967 winter steelhead, and 1,581,699 spring chinook. The hatchery is funded 83.7 percent by the COE, and 16.3 percent from the General Fund. The 1991-93 biennium budget is \$661,884.

(2) McKenzie Hatchery

This hatchery was completely rebuilt and expanded in 1976 in conjunction with the COE. This expansion was to mitigate for the building of the Blue River and Cougar Reservoirs on the upper McKenzie River. The facility is located on 16 acres, two miles east of Leaburg on Highway 126 at mile 22, approximately 22 miles east of the I-5 and highway 126 interchange in Eugene/Springfield. In 1990, the hatchery produced 2,081,543 spring chinook, 132,185 summer steelhead and 270 white sturgeon. The facility is funded 50 percent by the COE, and 50 percent from the General Fund, with a 1991-93 biennium budget of \$836,062.

(3) South Santiam Hatchery

The hatchery was constructed in 1968 by the COE as mitigation for the loss of an old hatchery and anadromous fish spawning areas when Green Peter and Foster Dams were constructed. It

is located on 12.6 acres of COE land on the north side of the South Santiam River, off of Highway 20, below Foster Dam, five miles east of downtown Sweet Home. The Foster Reservoir provides water for the facility. During 1990, the hatchery released 204,074 summer steelhead, 870,128 spring chinook, and 5,869,647 fall chinook. The facility is funded 64 percent by the Army Corps of Engineers and 36 percent from the General Fund. The 1991-93 biennium budget is \$705,644.

(4) Willamette Hatchery

Until 1983, the Willamette Trout Hatchery and the Oakridge Salmon Hatchery were operated as two separate hatcheries. The trout hatchery was originally built in 1922, and the salmon hatchery in 1911. In 1940, the COE rebuilt the salmon hatchery to compensate for loss of salmon habitat in the Middle Fork Willamette River due to construction of the Lookout Point Dam. The facility is located one mile southeast of Oakridge on Fish Hatchery Road, off of Highway 58. The hatchery produced and released 479,113 rainbow trout, 308,740 winter steelhead and 3,939,613 spring chinook in 1990. The facility is 83.75 percent funded from federal funds and 16.25 percent from the General Fund. The 1991-93 biennium budget is \$1,686,229.

c. Northeast Region

(1) Wallowa Hatchery

Construction of this hatchery was completed in 1938 and there have been several renovations and additions since then. The hatchery currently produces rainbow trout and coho to stock Oregon lakes and streams, and summer steelhead are produced for the Lower Snake River Compensation Plan program. The facility is located on 111 acres of ODFW land along Spring Creek, a tributary of the Wallowa River, one mile west of Enterprise on Fish Hatchery Road. The Big Canyon and Little Sheep Acclimation ponds are operated as satellite facilities. During 1990, the hatchery produced 89,329 rainbow trout, 495,875 summer steelhead, 115,875 coho, and 91,470 summer chinook. The facility is funded 45 percent from the Wildlife Fund, and 55 percent from federal funds from both the USFWS and the Lower Snake River Compensation Plan program. The 1991-93 biennium budget for the hatchery is \$612,649.

4. Utility-Funded Hatcheries

(1) Round Butte Hatchery

This hatchery was constructed in 1972 to provide spring chinook and summer steelhead smolts to meet the mitigation requirements of the Portland General Electric Company. It is located at the base of Round Butte Dam, ten miles west of Madras. Water is supplied to the hatchery from the Lake Billy Chinook Reservoir. During 1990, the facility produced 396,943 summer steelhead, 259,447 spring chinook, and 24,625 brown trout. The hatchery is fully funded by Portland General Electric, and employs a staff of four full-year and one seasonal positions. The 1991-93 biennium budget for the hatchery is \$449,095.

HATCHERY FUNDING
1991-93 Biennium Adopted Budget

HATCHERY AND SPECIES	BEGAN OPERATION	INVESTMENT COST	ORIGINAL FUNDING SOURCE	BIENNIAL PRODUCTION (pounds)	1990 PRODUCTION (# of fish)	ESTIMATED TOTAL SPORT CATCH %	1991-93 BIENNIAL FUNDING				FEDERAL AND MISC. SOURCE	
							TOTAL	GF	OF**	FF		MISC.
FEDERAL FUND												
COLUMBIA REGION												
Big Creek Hatchery	1940	1,057,788	GF									NMFS
Coho				91,334	719,225	11%						
Fall Chinook				303,032	14,354,477	11%						
Steelhead				24,000	126,819	100%						
Trout				6,000	9,391	100%						
Total				424,366	15,209,912	17%	866,551	0	0	866,551	0	
Bonneville Hatchery	1910	5,250,581	GF									NMFS/USACE
White Sturgeon					2,506	100%						
Summer Steelhead					381,096	100%						
Coho				307,694	4,231,144	33%						
Fall Chinook				599,654	25,790,500	16%						
Spring Chinook				100,694	588,397	24%						
Total				1,008,042	30,993,643	22%	2,157,049	0	0	2,099,886	57,163	
Cascade Hatchery	1959	1,171,815	NMFS									NMFS
Coho				226,670	4,191,748	26%						
Total				226,670	4,191,748	26%	695,096	0	0	695,096	0	
Gnat Creek Hatchery	1959	654,134	NMFS									NMFS
Steelhead				272,000	770,633	100%						
Trout				12,666	1,802	100%						
Coho				50,000	1,851,851	11%						
Total				334,666	2,624,286	87%	547,115	0	0	547,115	0	
Klaskanine Hatchery	1914	1,335,580	GF									NMFS
Coho				187,500	1,394,555	22%						
Fall Chinook					2,625,730							
Steelhead				24,000	60,086	100%						
Total				211,500	4,080,371	31%	578,565	0	0	578,565	0	
Oxbow Hatchery	1938	737,760	GF									NMFS
Coho				266,668	5,198,083	26%						
Spring Chinook					1,494,030							
Total				266,668	6,692,113	26%	583,172	0	0	583,172	0	
Sandy Hatchery	1952	660,295	GF									NMFS
Trout					44,915							
Coho				133,334	961,806	28%						
Total				133,334	1,006,721	28%	462,643	0	0	462,643	0	
TOTAL COLUMBIA REGION		10,867,953		2,605,246	64,798,794		5,890,191	0	0	5,833,028	57,163	

HATCHERY AND SPECIES	BEGAN OPERATION	INVESTMENT COST	ORIGINAL FUNDING SOURCE	BIENNIAL PRODUCTION (pounds)	1990 PRODUCTION (# of fish)	ESTIMATED TOTAL SPORT CATCH %	1991-93 BIENNIAL FUNDING				FEDERAL AND MISC. SOURCE	
							TOTAL	GF	OF**	FF		MISC.
NORTHWEST REGION												
Leaburg Hatchery	1954	752,794	USACE									USACE
Trout				480,945	835,248	100%						
Steelhead				67,750	196,087	100%						
Total				548,695	1,031,335	100%	1,250,197	0	0	1,250,197	0	
TOTAL NORTHWEST REGION		0		548,695	1,031,335		1,250,197	0	0	1,250,197	0	
NORTHEAST REGION												
Umatilla Hatchery	1992		BPA									BPA
Spring Chinook				178,000		24%						
Fall Chinook				198,000		24%						
Steelhead				79,332		100%						
Total				455,332	0	37%	2,074,642	0	0	2,074,642	0	
Irrigon Hatchery	1985	5,943,503	LSRCP (USFWS)									USFWS
Spring Chinook					227,210							
Fall Chinook					3,206,739							
Steelhead				676,286	1,887,923	100%						
Trout				31,000	182,537	100%						
Total				707,286	5,504,409	100%	1,466,581	0	0	1,466,581	0	
Lookingglass Hatchery	1981	5,565,487	LSRCP (USFWS)									USFWS
Spring Chinook				128,934	1,107,901	24%						
Total				128,934	1,107,901	24%	941,236	0	0	941,236	0	
TOTAL NORTHEAST REGION		11,508,990		1,291,552	6,612,310		4,482,459	0	0	4,482,459	0	
CENTRAL REGION												
SOUTHWEST REGION												
Cole Rivers Hatchery	1972	4,794,961	USACE									USACE
Coho				50,000	407,840	65%						
Fall Chinook				20,000		13%						
Spring Chinook				330,376	1,965,263	28%						
Steelhead				248,322	571,797	100%						
Trout				151,964	454,841	100%						
Total				800,662	3,399,741	66%	2,116,637	38,241	38,241	2,040,155	0	
TOTAL SOUTHWEST REGION		4,794,961		800,662	3,399,741		2,116,637	38,241	38,241	2,040,155	0	
TOTAL FEDERAL FUND		27,171,904		5,246,155	75,842,180		13,739,484	38,241	38,241	13,605,839	57,163	

HATCHERY AND SPECIES	BEGAN OPERATION	INVESTMENT COST	ORIGINAL FUNDING SOURCE	BIENNIAL PRODUCTION (pounds)	1990 PRODUCTION (# of fish)	ESTIMATED TOTAL SPORT CATCH %	1991-93 BIENNIAL FUNDING					FEDERAL AND MISC. SOURCE
							TOTAL	GF	OF**	FF	MISC.	
STATE FUNDED												
COLUMBIA REGION												
Cedar Creek	1923	1,338,433	WF, GF									WF
Steelhead				182,000	491,611	100%						
Trout				47,334	160,923	100%						
Fall Chinook				18,334	149,040	18%						
Spring Chinook				21,600	116,947	24%						
Coho				10,000		42%						
Total				279,268	918,521	87%	760,960	380,480	380,480	0	0	
Nehalem	1966	612,607	WF, GF									GF
Trout				10,000	16,867	100%						
Steelhead				72,000	211,212	100%						
Coho				106,666	948,116	51%						
Total				188,666	1,176,195	72%	568,236	284,118	284,118	0	0	
Trask	1915	961,445	WF, GF									WF, GF
Fall Chinook				24,342	215,629	25%						
Coho				174,308	1,680,648	39%						
Spring Chinook				60,866	358,734	19%						
Total				259,516	2,255,011	33%	688,658	267,978	420,680	0	0	
TOTAL COLUMBIA REGION		2,912,485		727,450	4,349,727		2,017,854	932,576	1,085,278	0	0	
NORTHWEST REGION												
Alsea Hatchery	1934	919,720	WF, GF									WF
Trout				83,333	192,377	100%						
Steelhead				182,399	1,247,151	100%						
Total				265,732	1,439,528	100%	618,660	309,330	309,330	0	0	
Fall Creek Hatchery	1953	485,274	WF, GF									GF
Coho				169,077	1,618,102	36%						
Fall Chinook				16,677	124,990	26%						
Total				185,754	1,743,092	35%	459,484	245,995	213,489	0	0	
Roaring River Hatchery	1925	737,129	WF, GF									WF
Trout **				173,965	1,270,100	100%		Portion (10,612 lbs) funded by Leaburg.				
Steelhead				83,000	274,015	100%						
Total				256,965	1,544,115	100%	527,458	263,729	263,729	0	0	
Salmon River Hatchery	1976	1,373,459	WF, GF									GF
Steelhead				32,000	138,908	100%						
Coho				204,990	1,467,235	45%						
Fall Chinook				28,571	211,483	35%						
Total				265,561	1,817,626	51%	630,966	315,483	315,483	0	0	

HATCHERY AND SPECIES	BEGAN OPERATION	INVESTMENT COST	ORIGINAL FUNDING SOURCE	BIENNIAL PRODUCTION (pounds)	1990 PRODUCTION (# of fish)	ESTIMATED TOTAL SPORT CATCH %	1991-93 BIENNIAL FUNDING					FEDERAL AND MISC. SOURCE
							TOTAL	GF	OF**	FF	MISC.	
TOTAL NORTHWEST REGION		3,515,582		974,012	6,544,361		2,236,568	1,134,537	1,102,031	0	0	
NORTHEAST REGION												
CENTRAL REGION												
Fall River Hatchery	1953	485,274	WF, GF									WF
Trout				91,850	948,629	100%						
Total				91,850	948,629	100%	302,274	151,137	151,137	0	0	
Klamath	1924	372,162	WF, GF									WF
Trout				114,492	2,498,771	100%						
Coho				2,000		20%						
Total				116,492	2,498,771	99%	427,438	213,719	213,719	0	0	
Oak Springs	1922	901,644	WF, GF									WF
Steelhead				58,000	695,218	100%						
Trout				252,070	1,699,672	100%						
Total				310,070	2,394,890	100%	768,082	384,041	384,041	0	0	
Wizard Falls	1948	917,697	WF, GF									WF
Trout				137,844	2,606,516	100%						
Total				137,844	2,606,516	100%	481,994	240,997	240,997	0	0	
TOTAL CENTRAL REGION		2,676,777		656,256	8,448,806		1,979,788	989,894	989,894	0	0	
SOUTHWEST REGION												
Bandon Hatchery	1926	406,619	WF, GF									WF
Coho				4,132	538,711	30%						
Steelhead				43,634	215,131	100%						
Fall Chinook				1,666	251,100	13%						
Total				49,432	1,004,942	91%	284,764	142,382	142,382	0	0	
Butte Falls	1916	347,038	WF, GF									WF
Trout				113,440	655,882	100%						
Coho				61,732	444,786	31%						
Fall Chinook				15,384	484,119	9%						
Spring Chinook				4,166	32,500	26%						
Total				194,722	1,617,287	69%	398,138	199,069	199,069	0	0	
Elk River	1968	1,184,510	WF, GF									GF
Fall Chinook				128,856	900,059	34%						
Steelhead				16,666	63,658	100%						
Total				145,522	963,717	42%	566,702	283,351	283,351	0	0	

HATCHERY AND SPECIES	BEGAN OPERATION	INVESTMENT COST	ORIGINAL FUNDING SOURCE	BIENNIAL PRODUCTION (pounds)	1990 PRODUCTION (# of fish)	ESTIMATED TOTAL SPORT CATCH %	1991-93 BIENNIAL FUNDING					FEDERAL AND MISC. SOURCE
							TOTAL	GF	OF**	FF	MISC.	
Rock Creek	1938	2,555,363	WF, GF									WF
Steelhead				96,532	208,426	100%						
Fall Chinook				20,000		66%						
Spring Chinook				91,250	363,979	9%						
Coho				28,000	285,928	34%						
Trout				38,000	75,586	100%						
Total				273,782	933,919	60%	709,213	338,221	338,221	0	32,771	
TOTAL SOUTHWEST REGION		4,493,530		663,458	4,519,865		1,958,817	963,023	963,023	0	32,771	
TOTAL STATE FUNDED		13,598,374		3,021,176	23,862,759		8,193,027	4,020,030	4,140,226	0	32,771	

HATCHERY AND SPECIES	BEGAN OPERATION	INVESTMENT COST	ORIGINAL FUNDING SOURCE	BIENNIAL PRODUCTION (pounds)	1990 PRODUCTION (# of fish)	ESTIMATED TOTAL SPORT CATCH %	1991-93 BIENNIAL FUNDING					FF AND MISC. SOURCE
							TOTAL	GF	OF**	FF	MISC.	
MIXED FUNDED												
COLUMBIA REGION												
Clackamas Hatchery	1980	2,186,463	City of Portland,									City of Portland,
Spring Chinook				317,758	1,558,712	37%						
Steelhead			PGE, GF, NMFS	52,000	70,320	100%						PGE, GF, NMFS
Total				369,758	1,629,032	46%	907,271	266,059	0	265,506	375,706	
TOTAL COLUMBIA REGION		2,186,463		369,758	1,629,032		907,271	266,059	0	265,506	375,706	
NORTHWEST REGION												
Marion Forks Hatchery	1949	1,103,677	USACE, GF									GF
Trout				240	37,990	100%						
Steelhead				40,000	133,967	100%						
Spring Chinook*				141,131	1,581,699	40%		Portion (29,520 lbs) funded by Clackamas.				
Total				181,371	1,753,656	53%	661,884	107,225	0	554,659	0	
McKenzie Hatchery	1976	3,068,330	USACE, GF									USACE, GF
White Sturgeon					270							
Steelhead*				51,556	132,185	100%		Funded by Alsea and Marion Forks ()				
Coho				20,000		25%					36,600	
Spring Chinook				235,950	2,081,543	40%		Portion (19,750 lbs) funded by S			Santiam.	
Total				307,506	2,213,998	49%	836,062	399,731	0	399,731	36,600	
South Santiam Hatchery*	1969	782,984	USACE, GF,									USACE, GF
Fall Chinook				265,091	5,869,647	18%						
Steelhead*			NMFS	77,300	204,074	100%						
Spring Chinook				90,547	870,128	40%						
Total				432,938	6,943,849	37%	976,779	211,693	0	765,086	0	

HATCHERY AND SPECIES	BEGAN OPERATION	INVESTMENT COST	ORIGINAL FUNDING SOURCE	BIENNIAL PRODUCTION (pounds)	1990 PRODUCTION (# of fish)	ESTIMATED TOTAL SPORT CATCH %	1991-93 BIENNIAL FUNDING					FEDERAL AND MISC. SOURCE
							TOTAL	GF	OF**	FF	MISC.	
Willamette Hatchery	1912	2,114,114	USACE, GF,									GF, WF
Spring Chinook				629,833	3,939,613	59%						
Trout			WF	139,609	479,113	100%						
Steelhead				47,905	308,740	100%						
Total				817,347	4,727,466	100%	1,645,198	373,830	158,740	1,112,628	0	
Portion (38,433) funded by Alsea ()												
St. Paul Ponds Hatchery	1963	83,926	WF, GF									WF
Large Mouth Bass					20,732	100%						
Total					20,732							
TOTAL NORTHWEST REGION		7,153,031		1,739,162	15,659,701		4,119,923	1,092,479	158,740	2,832,104	73,200	
NORTHEAST REGION												
Wallowa Hatchery	1938	2,956,201	WF, USFWS,									WF
Summer Steelhead					495,875							
Coho					115,875							
Spring Chinook					91,470							
Trout			LSRCP	79,166	89,329	100%						
Total				79,166	792,549	100%	612,649	128,778	128,778	355,093	0	
TOTAL NORTHEAST REGION		2,956,201		79,166	792,549		612,649	128,778	128,778	355,093	0	
TOTAL MIXED FUNDED		12,295,695		2,188,086	18,081,282		5,639,843	1,487,316	287,518	3,452,703	448,906	

HATCHERY AND SPECIES	BEGAN OPERATION	INVESTMENT COST	ORIGINAL FUNDING SOURCE	BIENNIAL PRODUCTION (pounds)	1990 PRODUCTION (# of fish)	ESTIMATED TOTAL SPORT CATCH %	1991-93 BIENNIAL FUNDING					FEDERAL AND MISC. SOURCE
							TOTAL	GF	OF**	FF	MISC.	
UTILITY FUNDED												
Round Butte Hatchery	1973	0 STATE \$	PGE									PGE
Spring Chinook				66,668	259,447	88%						
Trout				20,050	24,625	100%						
Steelhead				81,000	396,943	100%						
Total				167,718	681,015	95%	449,095	0	0	0	449,095	
TOTAL UTILITY FUNDED		0		167,718	681,015		449,095	0	0	0	449,095	

TOTALS (in thousands)

SUBTOTAL FEDERAL		27,172		5,246	75,842		13,739	38	38	13,606	57	
SUBTOTAL STATE		13,598		3,021	23,863		8,193	4,020	4,140	0	33	
SUBTOTAL MIXED		12,296		2,188	18,081		5,640	1,487	288	3,453	449	
SUBTOTAL UTILITY		0		168	681		449	0	0	0	449	
TOTAL ALL HATCHERIES		53,066		10,623	118,467		28,021	5,546	4,466	17,059	988	

- * South Santiam Hatchery includes Aumsville/Stayton ponds.
- ** Other funds except from agreements with utilities and other miscellaneous sources.

Notes: 1. Codes for funding sources as follows:

BPA - Bonneville Power Authority

GF - Oregon General Fund (under original funding source, means the Oregon Commercial Fish Commission [commercial]).

LSRCP - Lower Snake River Comprehensive Plan (USFWS).

NMFS - National Marine Fisheries Service.

PGE - Portland General Electric.

USACE - U. S. Army Corps of Engineers.

USFWS - U.S. Fish and Wildlife Service.

WF - Wildlife Fund (Other Funds). (Under original funding source, means Oregon Wildlife Commission (sport).)

- 2. Estimated sport catch based on multiple year catch from 1982-87 brood year average CWT recoveries. Not consistent from brood year average CWT recoveries. Not consistent from brood years or hatchery comparisons.

APPENDIX E.

**PROGRAM FUNDING
FOR THE 1987-89 AND
1989-91 BIENNIUMS**

REVENUE USE BY PROGRAMS, BY REGION AND BY FUND SOURCE FOR
1987-89 AND 1989-91 BIENNIUMS
(\$000s)

<u>Project</u>	<u>Region</u>	<u>All Funds</u>	<u>General</u>	<u>Wildlife</u>	<u>Misc.</u>	<u>Federal</u>
<u>1987-89 Biennium Regional</u>						
Propagation	Northwest	6,563.4	2,043.0	1,308.1	35.9	3,176.5
Freshwater	Northwest	1,435.6	233.0	555.9	0.8	645.9
Columbia	Northwest	83.4	0.0	0.0	0.0	83.4
Natural Production	Northwest					
Total	Northwest	8,082.4	2,276.0	1,864.0	36.7	3,905.8
Propagation	Southwest	3,636.2	1,178.1	740.0	22.7	1,695.3
Freshwater	Southwest	2,008.4	428.2	414.4	17.5	1,148.3
Natural Production	Southwest					
Total	Southwest	5,644.6	1,606.3	1,154.4	40.2	2,843.6
Propagation	Central	2,021.7	388.2	1,222.1	410.6	0.8
Freshwater	Central	2,591.1	49.7	624.5	95.6	1,821.3
Columbia	Central	137.9	0.0	0.0	0.0	137.9
Natural Production	Central					
Total	Central	4,750.8	437.9	1,846.6	506.2	1,960.0
Propagation	Northeast	2,484.4	40.6	337.1	0.0	2,106.7
Freshwater	Northeast	3,845.9	0.0	739.7	0.0	3,106.1
Columbia	Northeast	143.2	0.0	0.0	0.0	143.2
Total	Northeast	6,473.5	40.6	1,076.8	0.0	5,356.0
Propagation	Southeast	56.2	0.0	56.2	0.0	0.0
Freshwater	Southeast	318.1	0.0	318.1	0.0	0.0
Total	Southeast	374.3	0.0	374.3	0.0	0.0
Propagation	Columbia	8,497.1	1,840.8	437.6	373.5	5,845.2
Freshwater	Columbia	674.7	196.6	320.0	0.8	157.2
Columbia	Columbia	42.9	0.0	0.0	0.0	42.9
Natural Production	Columbia					
Total	Columbia	9,214.6	2,037.5	757.6	374.3	6,045.3
Marine Resources	Statewide	5,506.6	2,113.3	337.3	75.4	2,980.6
Research & Development	Statewide	6,565.5	651.4	396.7	500.9	5,016.5
Propagation	Statewide	4,490.7	892.9	638.4	52.2	2,907.3
Freshwater	Statewide	1,196.8	96.0	421.9	144.1	534.8
Columbia	Statewide	377.0	161.1	102.9	0.0	113.0
Administration	Statewide	2,052.1	1,260.6	548.4	168.2	74.9
Natural Production	Statewide					
Habitat Conservation	Statewide	855.0	249.9	73.1	254.2	277.9
Engineering	Statewide	1,376.5	418.9	283.6	0.0	674.1
Realty	Statewide	212.1	0.0	6.6	0.0	205.6
Public Affairs	Statewide	70.2	0.0	0.0	0.0	70.2
Total	Statewide	22,702.6	5,844.0	2,808.9	1,195.0	12,854.7

REVENUE USE BY PROGRAMS, BY REGION AND BY FUND SOURCE FOR
1987-89 AND 1989-91 BIENNIUMS (CONT.)
(\$000s)

<u>Project</u>	<u>Region</u>	<u>All Funds</u>	<u>General</u>	<u>Wildlife</u>	<u>Misc.</u>	<u>Federal</u>
<u>1987-89 Biennium Agencywide</u>						
Research	All	6,565.5	651.4	396.7	500.9	5,016.5
Propagation	All	27,749.8	6,383.5	4,739.5	894.9	15,731.8
Marine Resources	All	5,506.6	2,113.3	337.3	75.4	2,980.6
Freshwater	All	12,070.6	1,003.6	3,394.6	258.8	7,413.6
Columbia	All	784.3	161.1	102.9	0.0	520.3
Administration	All	2,052.1	1,260.6	548.4	168.2	74.9
Natural Production	All	0.0	0.0	0.0	0.0	0.0
Habitat Conservation	All	855.0	249.9	73.1	254.2	277.9
Realty	All	212.1	0.0	6.6	0.0	205.6
Other	All	1,446.7	418.9	283.6	0.0	744.3
Total	All	57,242.8	12,242.3	9,882.6	2,152.4	32,965.4
<u>1989-91 Biennium Regional</u>						
Propagation	Northwest	7,885.3	2,258.8	1,431.8	42.0	4,152.7
Freshwater	Northwest	1,818.6	58.2	994.8	39.7	726.0
Columbia	Northwest	43.2	0.0	0.0	0.0	43.2
Natural Production	Northwest	300.4	90.1	60.1	0.0	150.2
Total	Northwest	10,047.5	2,407.1	2,486.6	81.7	5,072.1
Propagation	Southwest	4,180.2	1,077.3	1,014.6	47.7	2,040.6
Freshwater	Southwest	2,348.6	237.5	729.5	81.8	1,299.8
Natural Production	Southwest	614.8	163.4	109.0	70.0	272.4
Total	Southwest	7,143.6	1,478.3	1,853.1	199.5	3,612.7
Propagation	Central	2,328.7	958.1	958.1	412.5	0.0
Freshwater	Central	3,195.7	6.1	806.9	318.3	2,064.3
Columbia	Central	13.5	0.0	0.0	0.0	13.5
Natural Production	Central	97.5	29.3	19.5	0.0	48.8
Total	Central	5,635.4	993.5	1,784.5	730.8	2,126.5
Propagation	Northeast	3,255.0	224.4	224.4	0.0	2,806.2
Freshwater	Northeast	3,807.9	0.0	915.8	15.3	2,876.8
Columbia	Northeast	54.9	0.0	0.0	0.0	54.9
Total	Northeast	7,117.9	224.4	1,140.2	15.3	5,737.9
Propagation	Southeast	66.6	33.3	33.3	0.0	0.0
Freshwater	Southeast	432.1	0.0	376.4	6.5	49.2
Total	Southeast	498.7	33.3	409.7	6.5	49.2
Propagation	Columbia	9,336.3	1,306.6	1,058.0	409.3	6,562.4
Freshwater	Columbia	850.5	6.7	713.2	65.4	65.2
Columbia	Columbia	40.4	20.0	0.0	0.0	20.4
Natural Production	Columbia	274.0	82.2	54.8	0.0	137.0
Total	Columbia	10,501.1	1,415.5	1,826.0	474.7	6,784.9

REVENUE USE BY PROGRAMS, BY REGION AND BY FUND SOURCE FOR
1987-89 AND 1989-91 BIENNIUMS (CONT.)
(\$000s)

<u>Project</u>	<u>Region</u>	<u>All Funds</u>	<u>General</u>	<u>Wildlife</u>	<u>Misc.</u>	<u>Federal</u>
Marine Resources	Statewide	6,511.6	2,394.6	754.7	111.5	3,250.8
Research & Development	Statewide	10,774.2	466.3	647.6	743.0	8,917.3
Propagation	Statewide	5,179.2	1,354.4	760.4	35.1	3,029.1
Freshwater	Statewide	1,470.3	72.8	519.0	41.0	837.5
Columbia	Statewide	529.3	163.1	147.9	0.0	218.3
Administration	Statewide	1,904.8	718.8	959.7	102.4	123.9
Natural Production	Statewide	662.5	89.4	314.0	77.3	181.9
Habitat Conservation	Statewide	1,442.8	371.1	153.2	465.4	453.1
Engineering	Statewide					
Realty	Statewide	1,018.2	0.0	33.4	0.0	984.8
Public Affairs	Statewide					
Total	Statewide	29,492.7	5,630.5	4,289.9	1,575.6	17,996.7

1989-91 Biennium Agencywide

Research	All	10,774.2	466.3	647.6	743.0	8,917.3
Propagation	All	32,231.2	7,213.0	5,480.6	946.6	18,591.0
Marine Resources	All	6,511.6	2,394.6	754.7	111.5	3,250.8
Freshwater	All	13,923.7	381.3	5,055.6	568.1	7,918.7
Columbia	All	681.2	183.1	147.9	0.0	350.3
Administration	All	1,904.8	718.8	959.7	102.4	123.9
Natural Production	All	1,949.3	454.4	557.3	147.3	790.2
Habitat Conservation	All	1,442.8	371.1	153.2	465.4	453.1
Realty	All	1,018.2	0.0	33.4	0.0	984.8
Other	All	0.0	0.0	0.0	0.0	0.0
Total	All	70,436.9	12,182.5	13,790.1	3,084.2	41,380.2

Notes: 1. Agencywide totals may be different than agencywide approved budgets, due to methodology of assigning fund sources to regions.

APPENDIX F.
HISTORICAL DEPARTMENT
BUDGETS

FISH PROGRAM REVENUE BUDGETS, 1975-77 BIENNIUM TO 1991-93 BIENNIUM

	Other Funds	General Funds	Federal Funds	All Funds
1991-1993 Approved				
Research	1,351,495	664,807	9,120,896	11,137,198
Propagation	8,138,557	7,073,573	21,459,078	36,671,208
Marine Program	1,342,401	2,360,667	3,370,235	7,073,303
Freshwater	5,156,155	883,271	8,931,586	14,971,012
Columbia	121,708	179,123	227,155	527,986
Fish Admin.	1,182,856	895,499	2,114,298	4,192,653
Natural Production	952,986	445,938	1,437,565	2,836,489
Habitat Conservation	1,946,351	747,813	2,053,240	4,747,404
OSP	14,098,428	0	0	14,098,428
Administration	16,770,907	2,127,102	1,788,503	20,686,512
CI	5,626,503	0	3,255,501	8,882,004
1989-1991 Estimated				
Research	1,190,260	473,653	7,901,376	9,565,289
Propagation	6,454,523	7,299,101	18,671,744	32,425,368
Marine Program	821,440	2,436,390	3,163,564	6,421,394
Freshwater	5,649,588	328,560	8,738,342	14,716,490
Columbia	147,867	224,191	358,933	730,991
Fish Admin.	1,236,624	619,923	1,300,722	3,157,269
Natural Production	740,714	496,616	829,610	2,066,940
Habitat Conservation	1,173,994	373,417	442,586	1,989,997
OSP	11,221,742	0	0	11,221,742
Administration	14,702,111	2,666,682	1,554,021	18,922,814
CI	1,584,455	0	2,424,055	4,008,510
1987-1989 Actual				
Research	938,221	577,862	4,675,341	6,191,424
Propagation	6,314,782	6,426,567	15,597,856	28,339,205
Marine Program	414,074	2,015,869	2,950,901	5,380,844
Freshwater	2,897,667	632,181	5,146,728	8,676,576
Columbia	1,264,591	698,324	453,707	2,416,622
Fish Administration	100,000	643,005	0	743,005
Natural Production	737,923	338,880	1,430,430	2,507,233
Habitat Conservation	874,611	254,900	252,400	1,381,911
OSP	10,186,257	0	0	10,186,257
Administration	11,288,762	1,989,477	0	13,278,239
CI	1,535,637	89,898	484,864	2,110,399
1985-1987 Actual				
Research	524,722	697,764	3,194,394	4,416,880
Propagation	5,850,423	4,923,882	10,536,804	21,311,109
Fish Management	5,058,879	4,236,223	3,401,481	12,696,583
Habitat Conservation	662,519	1,393,324	4,419,860	6,475,703
OSP	9,778,301	0	0	9,778,301
Administration	13,300,463	1,721,135	0	15,021,598
CI	1,053,369	100,000	1,138,356	2,291,725

FISH PROGRAM REVENUE BUDGETS, 1975-77 BIENNIUM TO 1991-93 BIENNIUM

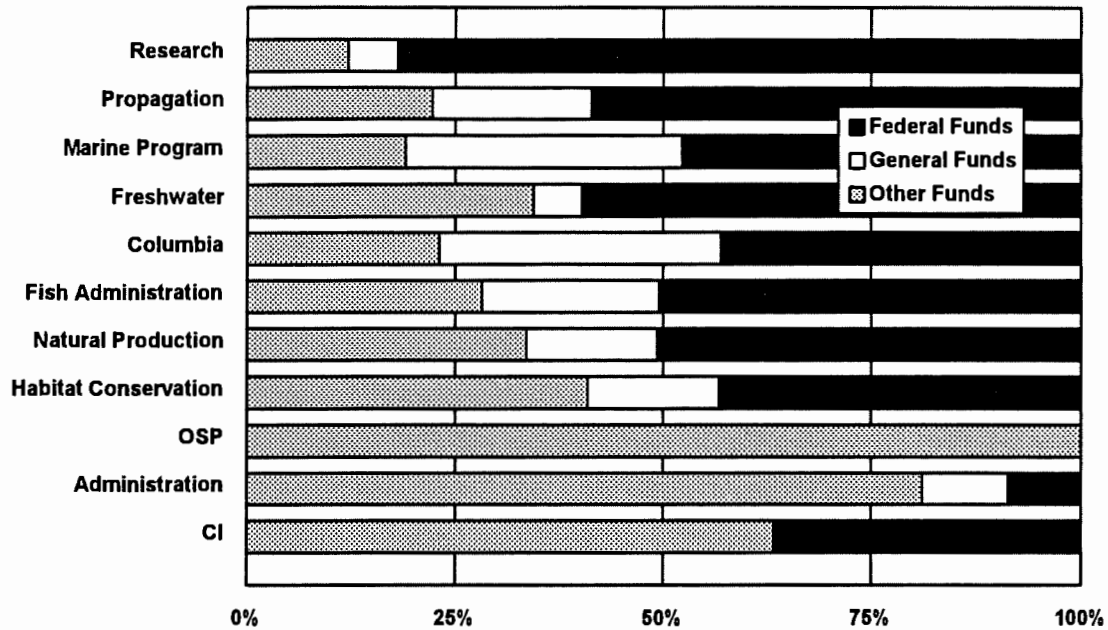
	Other Funds	General Funds	Federal Funds	All Funds
1983-1985 Actual				
Propagation	5,409,206	5,001,694	13,351,926	23,762,826
Habitat Improvement	869,262	644,527	1,415,022	2,928,811
Fish Management	4,221,282	2,966,773	3,068,510	10,256,565
Fish Research	470,108	781,798	4,298,285	5,550,191
OSP	8,860,000	0	0	8,860,000
Support Services	8,980,219	1,199,141	0	10,179,360
CI	649,930	434,880	1,114,896	2,199,706
1981-1983 Actual				
Propagation	6,098,830	3,778,036	9,192,496	19,069,362
Habitat Improvement	561,809	37,618	1,072,955	1,672,382
Fish Management	4,430,681	2,360,821	1,557,515	8,349,017
Research	871,104	521,953	2,939,589	4,332,646
OSP	9,234,000	0	12,000	9,246,000
Administration	7,862,626	1,000,920	0	8,863,546
CI	1,065,984	2,928	691,853	1,760,765
1979-1981 Actual				
Propagation	4,720,738	3,497,946	7,307,665	15,526,349
Habitat Improvement	648,227	71,443	617,090	1,336,760
Fish Management	3,259,417	2,137,903	1,760,252	7,157,572
Research	844,734	976,222	3,183,043	5,003,999
OSP	10,210,197	0	96,000	10,306,197
Administration	6,430,993	1,007,239	0	7,438,232
CI	773,167	24,057	225,806	1,023,030
1977-1979 Actual				
Propagation	4,175,577	3,112,765	6,631,037	13,919,379
Habitat Improvement	536,795	116,763	446,709	1,100,267
Fish Management	2,970,150	1,718,817	1,626,134	6,315,101
Research	961,342	316,064	2,465,917	3,743,323
OSP	5,480,562	931,124	0	6,411,686
Administration	5,480,562	931,124	0	6,411,686
CI	0	0	0	0
1975-1977 Actual				
Propagation	1,432,484	666,282	1,909,451	4,008,217
Habitat Improvement	107,261	26,401	161,530	295,192
Fish Management	503,317	273,018	380,008	1,156,343
Research	166,787	30,337	266,148	463,272
Administration	5,098,449	1,243,020	56,606	6,398,075
CI	746,406	66,828	607,377	1,420,611

OREGON DEPARTMENT OF FISH AND WILDLIFE
FISH PROGRAM EXPENDITURE BUDGETS, 1983-85 BIENNIUM TO 1991-93 BIENNIUM

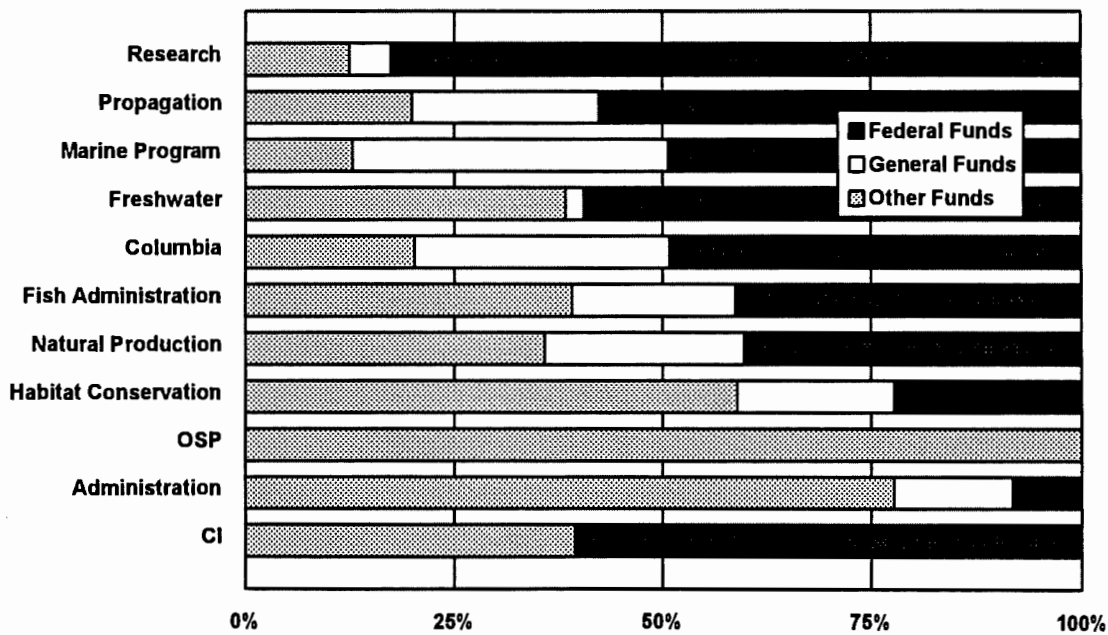
	Other Funds				General Funds				Federal Funds				All Funds			
	Personal	Services and	Debt	Capital	Personal	Services and	Capital	Personal	Services and	Capital	Total	Personal	Services and	Capital		
	Total	Supplies	Service	Outlay	Total	Supplies	Outlay	Total	Supplies	Outlay	Total	Services	Supplies	Outlay		
1991-1993 Approved																
Research	1,351,495	1,111,754	179,192	60,549	664,807	547,416	75,641	41,750	9,120,896	4,489,969	4,457,940	172,987	11,137,198	6,149,139	4,712,773	275,286
Propagation	8,138,557	4,254,986	3,780,866	102,705	7,073,573	4,656,779	2,027,439	389,355	21,459,078	9,663,236	10,727,423	1,068,419	36,671,208	18,575,001	16,535,728	1,560,479
Marine Program	1,342,401	1,167,132	141,649	33,620	2,360,667	1,780,837	538,784	41,046	3,370,235	2,910,977	439,133	20,125	7,073,303	5,858,946	1,119,566	94,791
Freshwater	5,156,155	4,004,120	1,072,992	79,043	883,271	821,048	61,686	537	8,931,586	4,298,484	4,469,165	163,937	14,971,012	9,123,652	5,603,843	243,517
Columbia	121,708	110,743	10,965	0	179,123	167,446	11,677	0	227,155	173,580	53,575	0	527,986	451,769	76,217	0
Fish Management	1,182,856	749,122	424,794	8,940	895,499	773,155	122,344	0	2,114,298	1,457,546	656,752	0	4,192,653	2,979,823	1,203,890	8,940
Natural Production	952,986	739,884	178,709	34,393	445,938	305,488	122,261	18,189	1,437,565	975,447	399,803	62,315	2,836,489	2,020,819	700,773	114,897
Habitat Conservation	1,946,351	1,292,950	626,951	26,450	747,813	422,871	319,942	5,000	2,053,240	1,412,549	454,282	186,409	4,747,404	3,128,370	1,401,175	217,859
Administration	16,770,907	11,910,848	3,817,526	655,473	2,127,102	1,151,893	913,089	62,120	1,788,503	382,048	1,321,373	85,082	20,686,512	13,444,789	6,051,988	534,262
CI	5,626,503	155,000	2,325,000	3,146,503	0	0	0	0	3,255,501	0	0	3,255,501	8,882,004	155,000	2,325,000	6,402,004
1989-1991 Estimated																
Research	1,190,260	881,761	168,198	140,301	473,653	366,734	69,077	37,842	7,901,376	3,837,558	3,891,982	171,836	9,565,289	5,086,053	4,129,257	349,979
Propagation	6,454,523	3,843,271	2,236,270	374,982	7,299,101	4,442,027	2,483,958	373,116	18,671,744	9,712,224	7,626,990	1,332,530	32,425,368	17,997,522	12,347,218	2,080,628
Marine Program	821,440	670,008	124,647	26,785	2,436,390	2,132,983	236,982	66,425	3,163,564	2,778,854	340,922	43,788	6,421,394	5,581,845	702,551	136,998
Freshwater	5,649,588	4,498,865	936,036	214,687	328,560	266,922	56,477	5,161	8,738,342	4,602,617	3,949,766	185,959	14,716,490	9,368,404	4,942,279	405,807
Columbia	147,867	137,848	10,019	0	224,191	216,069	8,122	0	358,933	306,259	49,619	3,055	730,991	660,176	67,760	3,055
Fish Management	1,236,624	397,219	808,655	30,750	619,923	382,372	206,801	30,750	1,300,722	88,103	1,212,619	0	3,157,269	867,694	2,228,075	61,500
Natural Production	740,714	490,936	230,211	19,567	496,616	360,773	111,340	24,503	829,610	586,802	202,238	40,570	2,066,940	1,438,511	543,789	84,640
Habitat Conservation	1,173,994	814,525	351,752	7,717	373,417	343,417	30,000	0	442,586	341,224	99,162	2,200	1,989,997	1,499,166	480,914	9,917
Administration	14,702,111	10,538,963	3,583,939	579,209	2,666,682	1,464,262	1,136,345	66,075	1,554,021	269,588	1,206,733	77,700	18,922,814	12,272,813	5,927,017	722,984
CI	1,584,455	0	0	1,584,455	0	0	0	0	2,424,055	0	0	2,424,055	4,008,510	0	0	4,008,510
1987-1989 Actual																
Research	938,221	759,824	130,964	47,433	577,862	414,456	102,848	60,558	4,675,341	2,471,796	2,084,244	119,301	6,191,424	3,646,076	2,318,056	227,292
Propagation	6,314,782	3,827,032	2,289,909	197,841	6,426,567	3,413,393	2,719,414	293,760	15,597,856	7,720,759	7,235,614	641,483	28,339,205	14,961,184	12,244,937	1,133,084
Marine Program	414,074	342,464	38,633	32,977	2,015,869	1,677,473	251,270	87,126	2,950,901	2,348,407	529,900	72,594	5,380,844	4,368,344	819,803	192,697
Freshwater	2,897,667	2,199,281	468,682	229,704	632,181	527,928	86,872	17,381	5,146,728	2,741,259	2,123,972	281,497	8,676,576	5,468,468	2,679,526	528,582
Columbia	1,264,591	501,302	413,019	350,270	698,324	473,114	206,524	18,686	453,707	338,892	114,511	304	2,416,622	1,313,308	734,054	369,260
Fish Management	100,000	0	100,000	0	643,005	3,867	539,497	99,641	0	0	0	0	743,005	3,867	639,497	99,641
Natural Production	737,923	574,500	109,580	53,843	338,880	245,328	81,384	12,168	1,430,430	1,082,607	273,883	73,940	2,507,233	1,902,435	464,847	139,951
Habitat Conservation	874,611	731,999	106,153	36,459	254,900	214,397	40,503	0	252,400	223,805	28,595	0	1,381,911	1,170,201	175,251	36,459
Administration	11,288,762	7,286,320	3,221,941	780,501	1,989,477	1,388,572	537,678	63,227	0	0	0	0	13,278,239	8,674,892	3,759,619	843,728
CI	1,535,637	65,913	164,993	1,304,731	89,898	3,965	1,146	84,787	484,864	34,922	64,458	385,484	2,110,399	104,800	230,597	1,775,002
1985-1987 Actual																
Research	524,722	436,609	87,079	1,034	697,764	552,749	127,874	17,141	3,194,394	2,448,857	700,542	44,995	4,416,880	3,438,215	915,495	63,170
Propagation	5,850,423	2,673,221	2,997,973	179,229	4,923,882	3,975,133	562,198	386,551	10,536,804	6,520,408	3,429,666	586,730	21,311,109	13,168,762	6,989,837	1,152,510
Fish Management	2,046,213	1,608,797	293,052	144,364	4,029,186	3,146,855	767,857	114,474	3,401,481	2,764,069	593,313	44,099	9,476,880	7,519,721	1,654,222	302,937
Habitat Conservation	662,519	477,114	155,900	29,505	1,393,324	1,106,181	187,896	99,247	4,419,860	1,777,478	2,172,894	469,488	6,475,703	3,360,773	2,516,690	598,240
Administration	9,120,463	6,866,041	2,006,079	248,343	1,409,666	930,539	438,031	41,096	0	0	0	0	10,530,129	7,796,580	2,444,110	289,439
CI	1,053,369	4,660	71,211	977,498	99,984	4,838	36,077	59,069	1,138,356	33,097	135,417	969,842	2,291,709	42,595	242,705	2,006,409
1983-1985 Actual																
Propagation	5,292,931	3,322,260	1,764,387	206,284	5,000,850	2,837,538	1,914,862	248,450	11,320,771	6,082,842	4,787,759	450,170	21,614,552	12,242,640	8,467,008	904,904
Habitat Improvement	869,262	630,206	198,528	40,528	644,509	361,337	254,613	28,559	1,199,910	783,174	323,618	93,118	2,713,681	1,774,717	776,759	162,205
Fish Management	4,221,282	3,426,084	674,224	120,974	2,966,773	2,521,350	390,325	55,098	2,605,191	1,667,381	864,382	73,428	9,793,246	7,614,815	1,928,931	249,500
Research	470,108	364,489	103,818	1,801	780,796	603,071	152,729	24,996	3,648,811	2,779,094	814,701	55,016	4,899,715	3,746,654	1,071,248	81,813
Support Services	8,980,219	5,628,840	2,952,968	398,411	1,114,829	675,864	360,690	78,275	0	0	0	0	10,095,048	6,304,704	3,313,658	476,686
CI	649,930				434,880				1,114,896				2,199,706	0	0	0

REVENUES BY PROGRAMS AND BY FUND SOURCES
FOR 1975-77 THROUGH 1991-93 BIENNIUMS

1991-1993 Biennium Approved

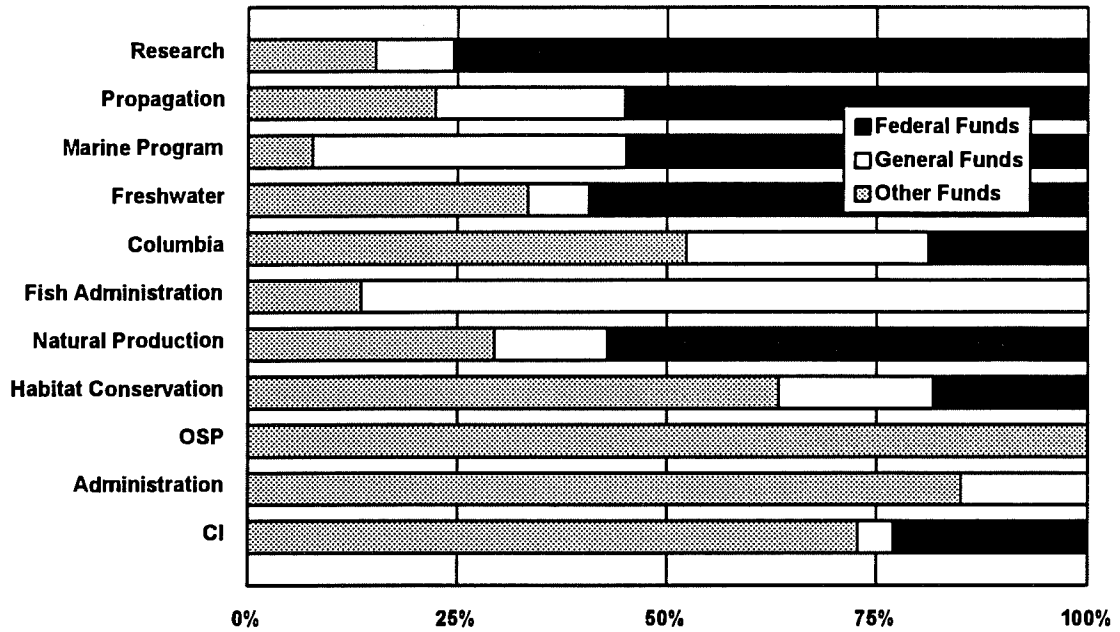


1989-1991 Biennium Estimated

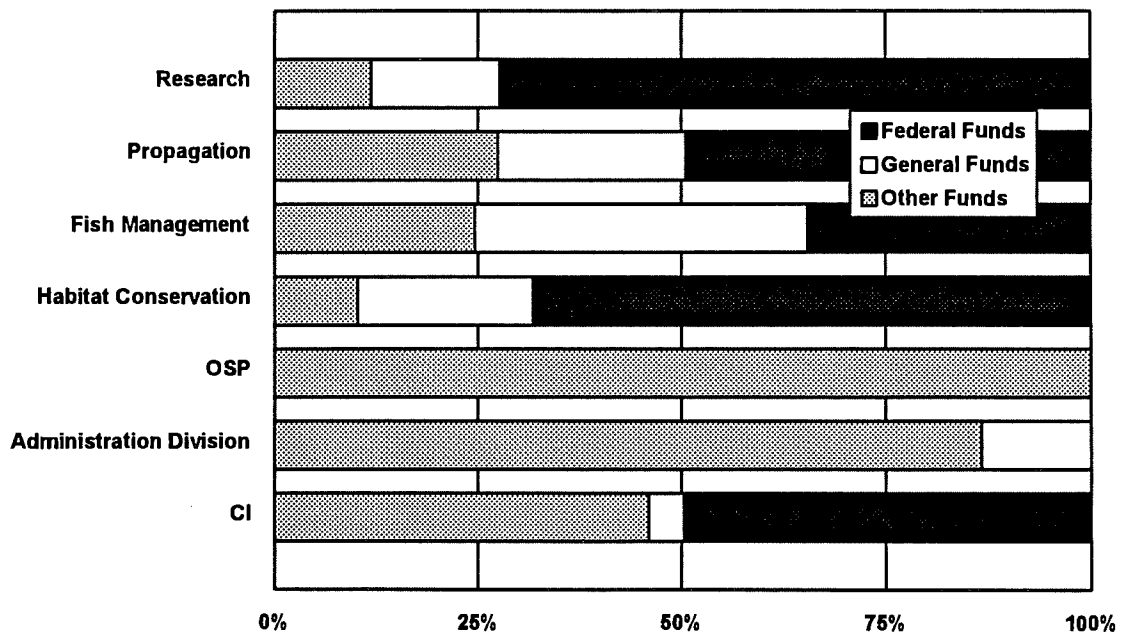


REVENUES BY PROGRAMS AND BY FUND SOURCES
FOR 1975-77 THROUGH 1991-93 BIENNIUMS (CONT.)

1987-1989 Biennium Actual

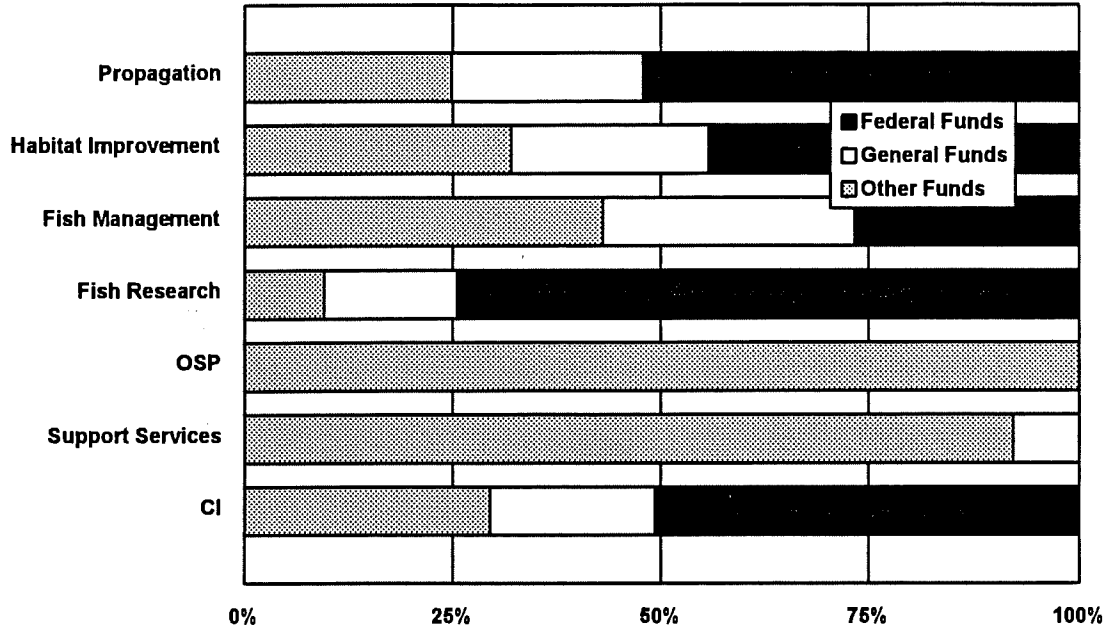


1985-1987 Biennium Actual

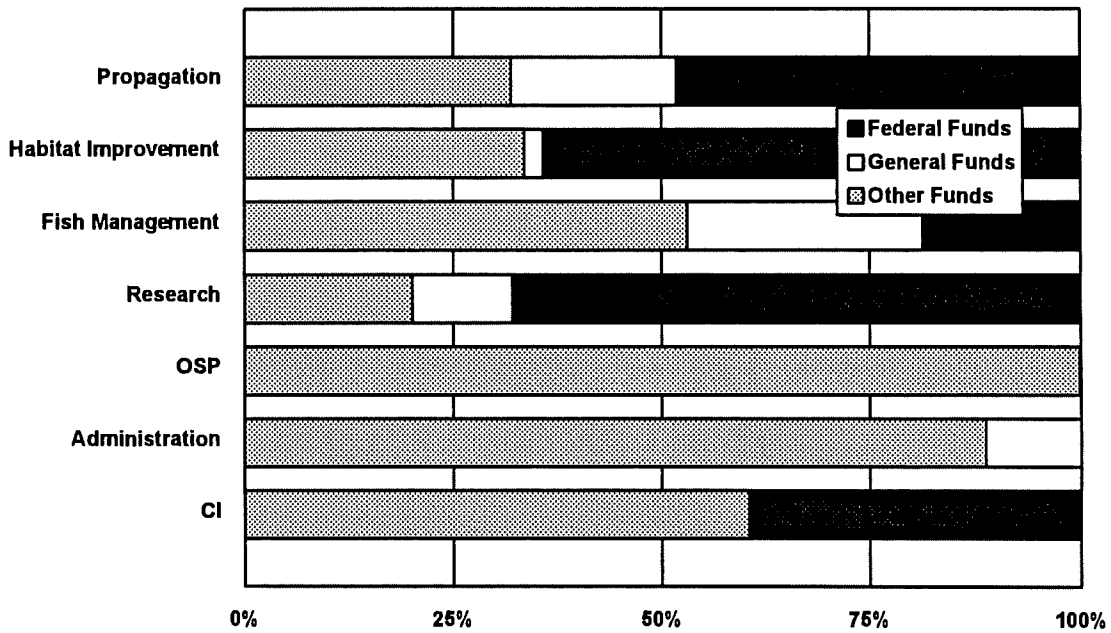


REVENUES BY PROGRAMS AND BY FUND SOURCES
FOR 1975-77 THROUGH 1991-93 BIENNIUMS (CONT.)

1983-1985 Biennium Actual

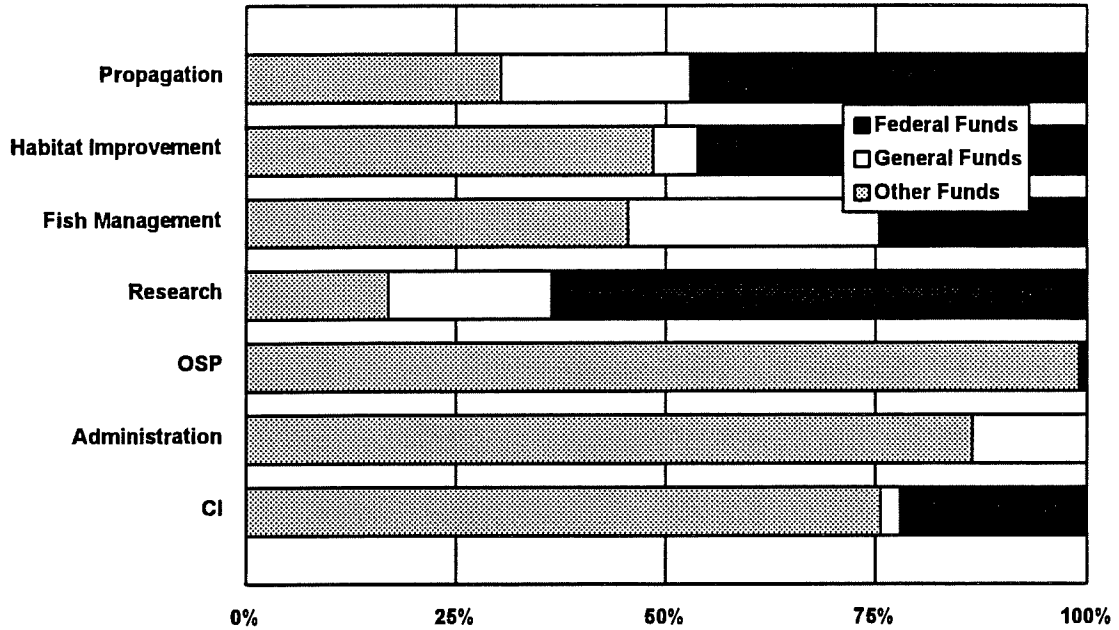


1981-1983 Biennium Actual

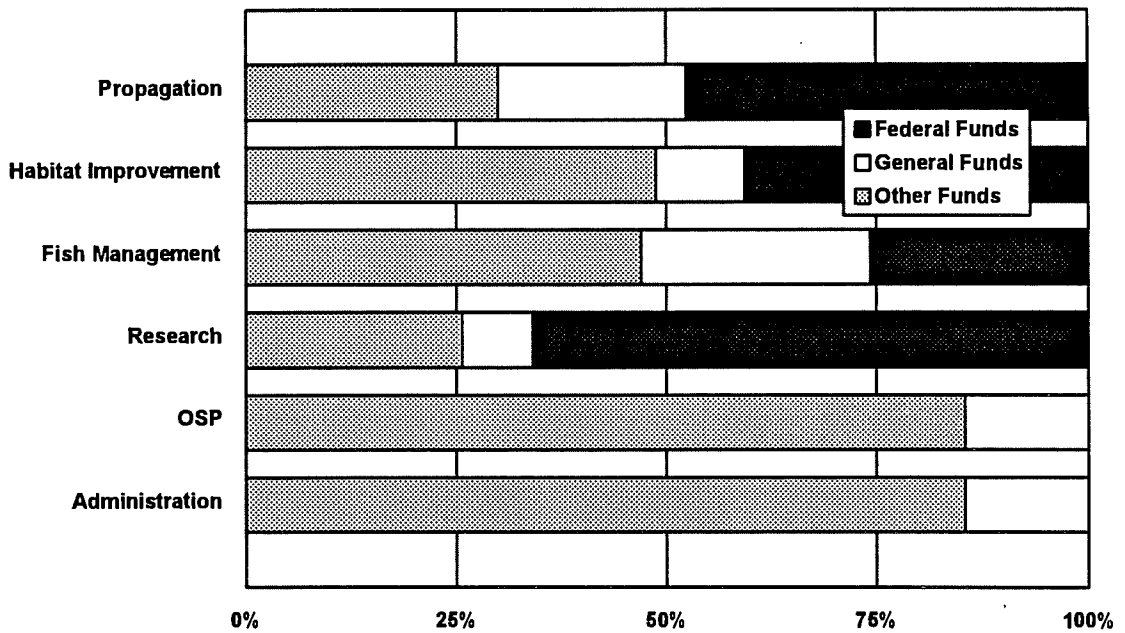


REVENUES BY PROGRAMS AND BY FUND SOURCES
FOR 1975-77 THROUGH 1991-93 BIENNIUMS (CONT.)

1979-1981 Biennium Actual

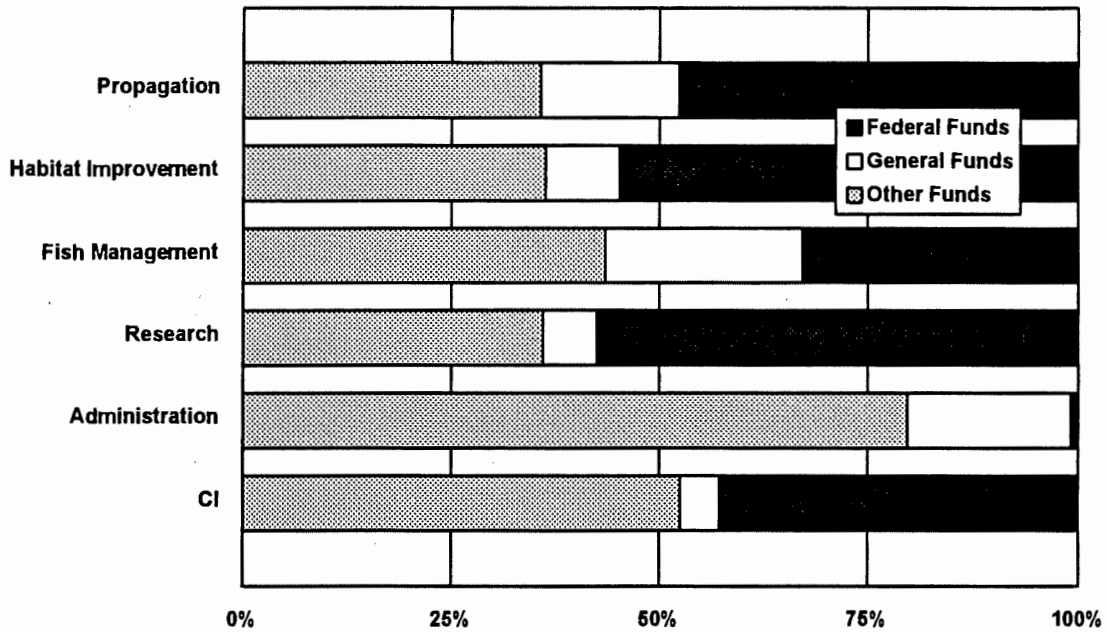


1977-1979 Biennium Actual

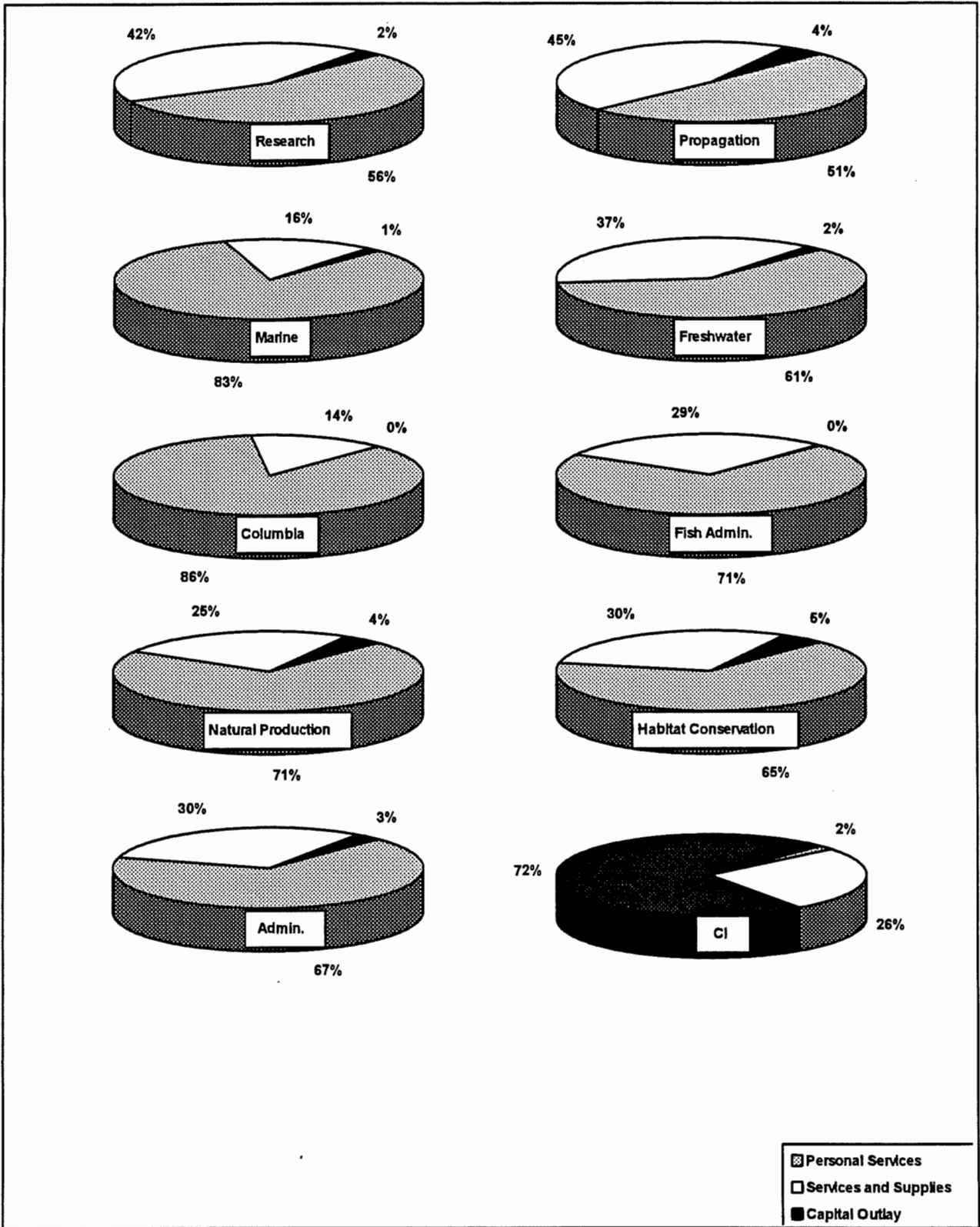


REVENUES BY PROGRAMS AND BY FUND SOURCES
FOR 1975-77 THROUGH 1991-93 BIENNIUMS (CONT.)

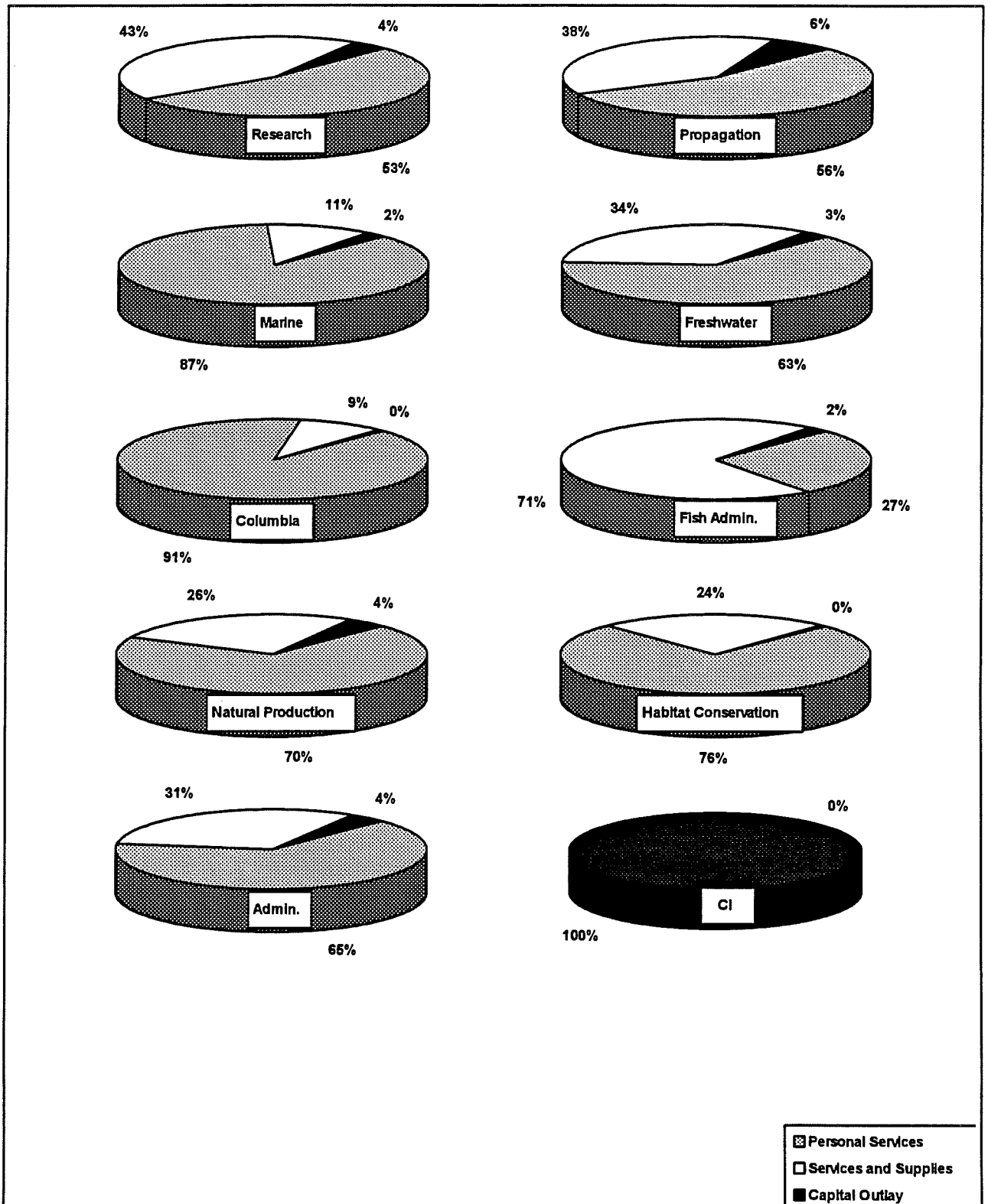
1975-1977 Biennium Actual



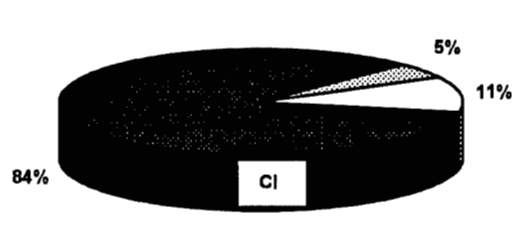
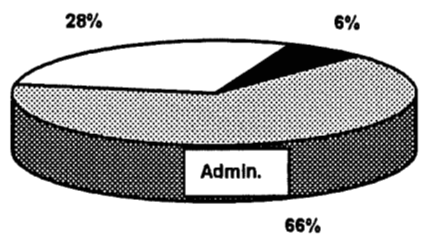
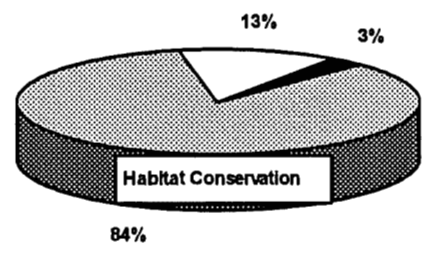
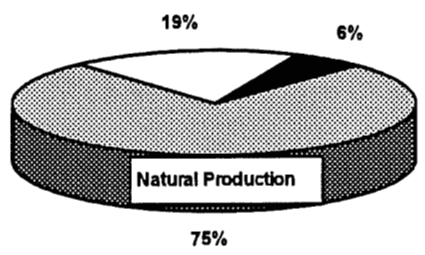
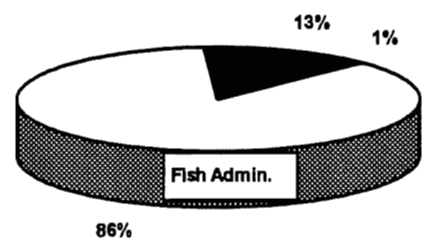
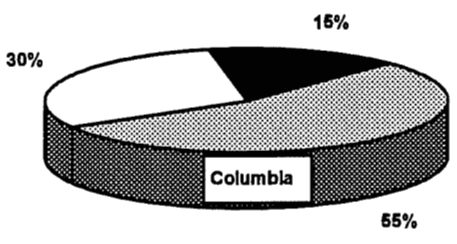
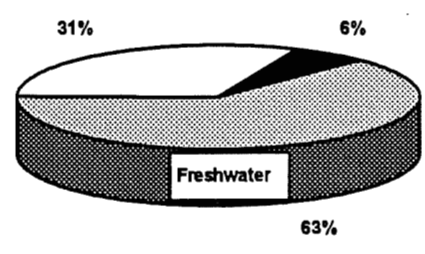
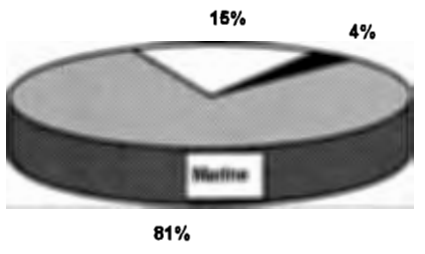
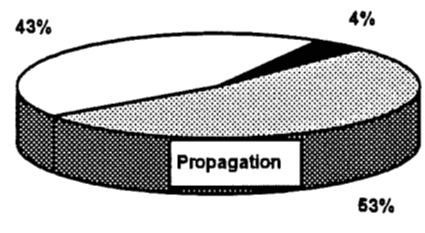
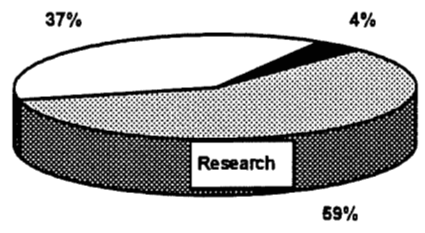
EXPENDITURES BY PROGRAM FOR 1983-85 THROUGH 1991-93 BIENNIUMS
 1991-1993 Biennium Approved



EXPENDITURES BY PROGRAM FOR 1983-85 THROUGH 1991-93 BIENNIUMS (CONT)
 1989-1991 Biennium Estimated

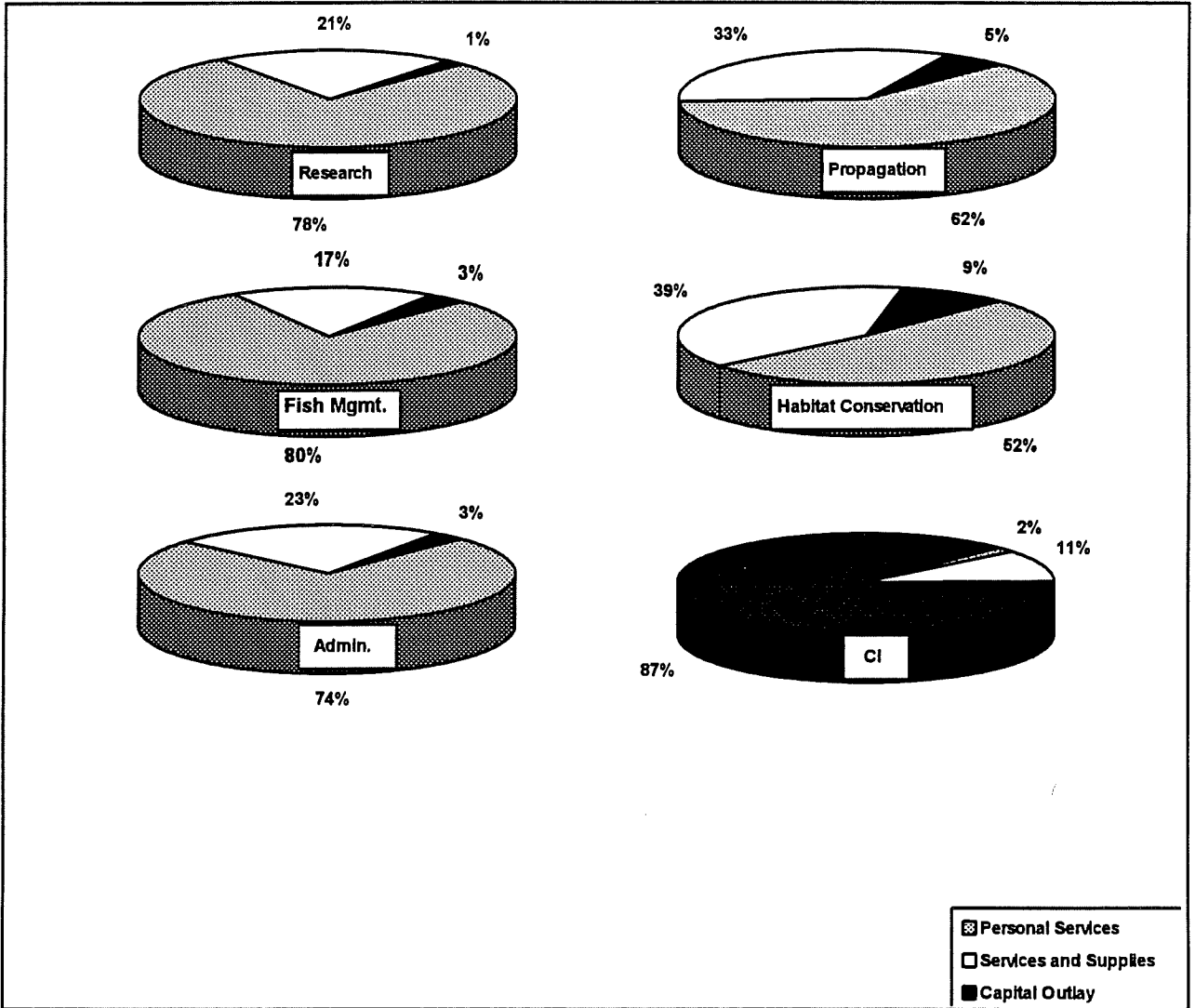


EXPENDITURES BY PROGRAM FOR 1983-85 THROUGH 1991-93 BIENNIUMS (CONT)
 1987-1989 Biennium Actual

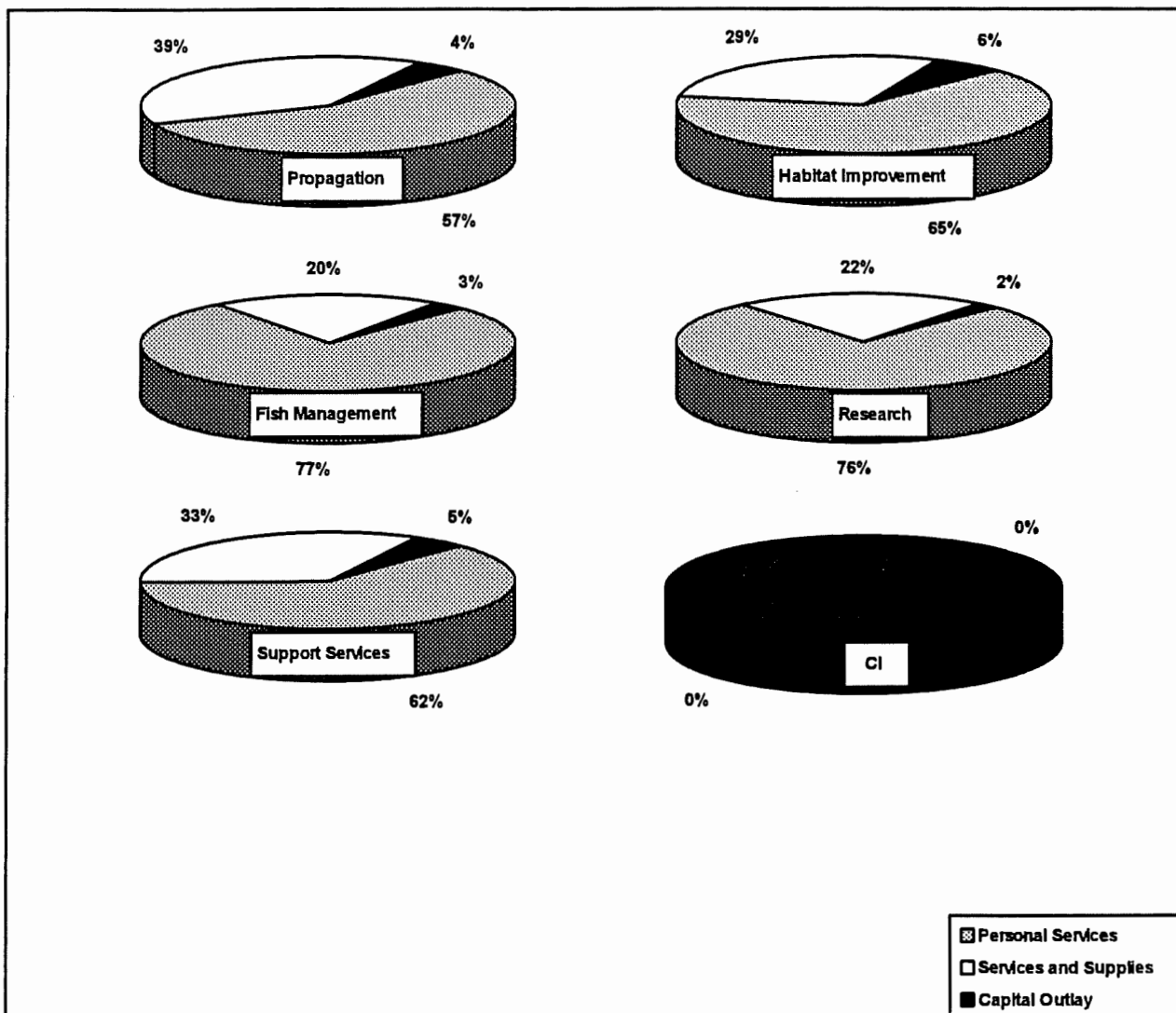


Personal Services
 Services and Supplies
 Capital Outlay

EXPENDITURES BY PROGRAM FOR 1983-85 THROUGH 1991-93 BIENNIUMS (CONT)
 1985-1987 Biennium Actual



EXPENDITURES BY PROGRAM FOR 1983-85 THROUGH 1991-93 BIENNIUMS (CONT)
 1983-1985 Biennium Actual



APPENDIX G.

**ALLOCATION OF COHO
SALMON HARVEST SOUTH
OF CAPE FALCON**

ALLOCATION OF COHO SALMON HARVEST SOUTH OF CAPE FALCON

1. The following allocation schedule will be used in determining preseason allocation shares of coho salmon south of Cape Falcon, Oregon. The respective shares may be altered inseason if coho initially allocated to the recreational fishery but surplus to completing the recreational seasons are reallocated to the commercial fishery in accordance with paragraph 3, page B-3.
2. The allocation schedule is based on the following formula:
 - a. Up to 350,000 allowable ocean harvest: the first 150,000 fish will be allocated to the recreational fishery. Additional fish will be allocated 66.7 percent to troll and 33.3 percent to recreational. The incidental coho mortality for a commercial ~~all-salmon-except coho~~ fishery will be deducted from the troll allocation. If the troll allocation is insufficient for this purpose, the remaining number of coho needed for this estimated incidental coho mortality will be deducted from the recreational share.
 - b. From 350,000 to 800,000 allowable ocean harvest: the recreational allocation is equal to 14 percent of the allowable harvest above 350,000 fish, plus 217,000 fish. The remainder of the allowable ocean harvest will be allocated to the troll fishery.
 - c. Above 800,000 allowable ocean harvest: the recreational allocation is equal to 10 percent of the allowable harvest above 800,000 fish plus 280,000 fish. The remainder of the allowable ocean harvest will be allocated to the troll fishery.
 - d. The above formula will be used to interpolate between allowable harvest levels shown in the table on page B-2.

[Start of Amendment 10 Language]

3. The allocation schedule is designed to give sufficient coho to the recreational fishery to increase the probability of attaining no less than a Memorial Day to Labor Day season as stock sizes increase. This increased allocation means that, in many years, actual catch in the recreational fishery may fall short of its allowance. In such situations, managers will make an inseason reallocation of unneeded recreational coho to the south of Cape Falcon troll fishery. The reallocation should be structured and timed to allow the commercial fishery sufficient opportunity to harvest any available reallocation prior to September 1, while still assuring completion of the scheduled recreational season (usually near mid-September) and, in any event, the continuation of a recreational fishery through Labor Day. This reallocation process will occur no later than August 15 and will involve projecting the recreational fishery needs for the remainder of the summer season. The remaining projected recreational catch needed to extend the season to its scheduled closing date will be a harvest guideline rather than a quota. If the guideline is met prior to Labor Day, the season may be allowed to continue if further fishing is not expected to result in any significant danger of impacting the allocation of another fishery or of failing to meet an escapement goal.

[End of Amendment 10 Language]

Allowable Ocean Harvest (thousands of coho)	Commercial Harvest		Recreational Harvest	
	Number (thousands)	Percentage	Number (thousands)	Percentage
2,700	2,230	82.6	470	17.4
2,600	2,140	82.3	460	17.7
2,500	2,050	82.0	450	18.0
2,400	1,960	81.7	440	18.3
2,300	1,870	81.3	430	18.7
2,200	1,780	80.9	420	19.1
2,100	1,690	80.5	410	19.5
2,000	1,600	80.0	400	20.0
1,900	1,510	79.5	390	20.5
1,800	1,420	78.9	380	21.1
1,700	1,330	78.2	370	21.8
1,600	1,240	77.5	360	22.5
1,500	1,150	76.7	350	23.3
1,400	1,060	75.7	340	24.3
1,300	970	74.6	330	25.4
1,200	880	73.3	320	26.7
1,100	790	71.8	310	28.2
1,000	700	70.0	300	30.0
900	610	67.8	290	32.2
800	520	65.0	280	35.0
700	434	62.0	266	38.0
600	348	58.0	252	42.0
500	262	52.4	238	47.6
400	176	44.0	224	56.0
350	133	38.0	217	62.0
300	100	33.3	200	66.7
200	33	16.5	167	83.5 ^{a/}
100	a/	a/	a/	a/

a/ An incidental coho allowance associated with any commercial all-salmon-except coho fishery will be deducted from the recreational share of coho during periods of low coho abundance when the commercial allocation of coho under the schedule would be insufficient to allow for incidental hooking mortality of coho in the commercial all-salmon-except coho fishery.