Northwest Power and Conservation Council

January 4, 2006

MEMORANDUM

TO: Council Members

FROM: Terry Morlan

SUBJECT: IEAB Report on Review of Idaho Salmon Fishery Value

The Council's Independent Economic Analysis Board was asked to review a study by Don Reading entitled *The Potential Economic Impact of Restored Salmon and Steelhead Fishing in Idaho*. In particular, the Council was interested in the contrast between the findings in the Reading study and those of the IEAB's analysis on *Economic Effects from Columbia River Basin Anadromous Salmonid Fish Production.*

Hans Radtke will describe the IEAB's findings. The IEAB's task description and its report, *Review of the Estimated Economic Impacts of Salmon Fishing in Idaho,* reviewing the Reading study are attached. The IEAB review is attracting quite a bit of attention around the region. That is good because one of the purposes of the report was to provide some guidelines for carrying out proper economic impact studies. Such studies are one of the most misused and misunderstood forms of economic analysis.

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Review of the Estimated Economic Impacts of Salmon Fishing in Idaho

Task Number 99

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Background

In "The Potential Economic Impact of Restored Salmon and Steelhead Fishing in Idaho" (2005) Don Reading reports that recreational fishing from a restored salmon and steelhead recreational fishery would have economic output impacts of $544 million annually in Idaho. The IEAB, in its "Economic Effects from Columbia River Basin Anadromous Salmonid Fish Production" (2005) reports that recreational and commercial fishing for salmon and steelhead originating in the Columbia River Basin creates $140 million in total personal income throughout the western U.S. and Canada. This review explains why economic impact estimates presented in the two studies are so different. In addition, we provide some general recommendations for estimating and reporting economic impacts of recreation and sport fishing.

The two critical steps in developing an economic impact assessment of an improved Idaho salmon run are: (1) produce a forecast of the increase of in-state angling activity and expenditure that will be triggered by the increased salmon run, and (2) determine the economic impact due to this increase in expenditures in Idaho caused by the increased angling activity. The Reading study includes both of these steps in developing its economic impact assessment. However, we find some technical errors in both steps.

The IEAB commented on Reading's earlier work in 1997. Since that time Reading has produced several studies that claim to show large local and state-level economic impacts from salmon and steelhead fishing (Reading, 1999; 2003; 2005). The IEAB agrees that salmon and steelhead fishing can result in large local impacts in some cases. However, we find that Reading's analysis substantially overstates these impacts.

Three factors explain most of the difference between the two studies; a more detailed numerical analysis is provided as Appendix 1.

The two studies report entirely different economic measures. Reading uses angler expenditures and value of output as measures of impact. Value of output, in Reading's case, is also equal to total sales from all industries and households in the local economy. In contrast, the IEAB study reports personal income, which includes wages and salaries, proprietor's incomes and certain net incomes. Expenditures, value

of output and personal income are all very different measures. Personal income is normally a fraction of value of output.

The two studies cover different geographical areas. One obvious reason for the difference in results is the difference in the geographic area covered. Reading does not provide estimates for the entire western U.S. and Canada, as does the IEAB. However, the IEAB's Snake River region is reasonably similar to Reading's Idaho region. In the IEAB's study, personal income impacts for just the Snake River region amount to $7 million of the $140 million total. Therefore, for a similar geographic area, $7 million of personal income (IEAB) can be compared to $544 million of output (Reading).

Reading's economic impact estimates are too large. There are several reasons why we believe that the Reading study overstates the increase in the amount of expenditure and value of output attributable to a restored salmon and steelhead fishery.

1. The number of 458,000 salmon and steelhead fishing trips for the restored fishery is too high

Of the 458,000 trips, 281,000 trips would be taken for salmon and about 50,000 fish would be caught. An average of 1 salmon would be caught every 5.6 trips or 1 salmon per 10 days of fishing. Given the assumed number of salmon available to catch, the number of trips is too high.

2. The retail sales margin was not accounted for in estimating total value of output impacts, so the value of output is overstated.

Input-Output (I-O) models include only the value of services provided by the transportation, wholesale and retail sectors, not the cost of goods sold. The level of retail expenditure input to the model should have been reduced by subtracting the cost of goods sold before calculating economic impacts.

After accounting for all of these factors, Appendix 1 shows that Reading's restored fishery would provide a personal income contribution in Idaho similar to the $7 million estimated by the IEAB for the Snake River region.

Reading's economic impact from the restored fishery is actually the impact of the entire fishery, not the incremental impact of restoration relative to recent conditions.

Reading (2005) states that "[t]he recovery of Snake River Basin salmon and steelhead runs . . . would provide . . . substantial economic benefits to Idaho." O'Laughlin (2005)[1] shows that recent run sizes and fishing levels account for much of the run size associated

[1] O'Laughlin, Jay. Economic Impact of Salmon and Steelhead Fishing in Idaho: Review of the Idaho Rivers United Report. University of Idaho, Moscow. September 2005.

with Reading's "restored fishery." Reading's own data shows actual trips for salmon in 2001 and steelhead in 2002-03 to be 280,000, or 62.5 percent of the "restored fishery" trips. The incremental effect of the restored fishery relative to recent conditions is much less than Reading reports.

Assumptions about the distribution of fishing expenditure probably result in community impacts being overstated.

Last, the IEAB continues to be concerned about the "communities" analysis because of how Reading represents the distribution of expenditures during the trip. Expenditures are categorized into "money spent at home before the trip" and "money spent during the trip." The Reading analysis assumes that money spent during each fishing trip is spent entirely in the Idaho communities where fishing occurs. Because much of this expenditure may occur en-route, and not in the "local communities," this procedure results in an overestimate of local expenditures and economic impacts.

Economic impacts are not economic benefits and they should not be represented as such.

In the most recent study, Reading (2005) states that "[t]he benefit of a restored salmon and steelhead fishery to Idaho's economy could reach $544 million annually."[2] Reading's statement suggests that Idahoans would be better off by $544 million if the fishery were restored. This inference would be incorrect. Value of output is not the same as economic benefit. Economic value of output is just the amount of money changing hands. It represents revenue for one person but expenditure for another. While personal income is not strictly a measure of economic benefit, it is closer to a measure of economic benefit than output, and we recommend that regional impact estimates be framed in terms of personal income. A more detailed discussion of the relationship between impacts and benefits is provided in Appendix 2.

Recommendations for Evaluating Economic Impact Studies.

Regional impact studies should include both personal income and employment as reported measures. Other economic measures, if available, should also be reported. Recreation studies should report all available measures of effort including trips, days per trip, party size and catch. Expenditure data should include explicit information on where the expenditures occurred corresponding to the region(s) of interest. Recreation impact studies should consider where recreationists would have spent their money in the absence of the recreational opportunity being studied.

[2] Reading, Don C. 2005. The Potential Economic Impact of Restored Salmon and Steelhead Fishing in Idaho. Page 2.

References Cited

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O'Laughlin, Jay. Economic Impact of Salmon and Steelhead Fishing in Idaho: Review of the Idaho Rivers United Report. University of Idaho, Moscow. September 2005.
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Appendix 1. Reconciling Numerical Estimates from Reading (2005) and IEAB (2005)

Why does Reading's Idaho fishing study result in $196 million in expenditures and output impacts of $544 million in Idaho while the IEAB study of the whole West Coast and all Columbia River stocks results in a contribution of no more than $140 million in total personal income?

Three factors are most important

First, these two study results are not for comparable geographical areas. Reading provides numbers for Idaho. The IEAB provides a disaggregation that includes numbers for the Snake River region, which is roughly comparable to Idaho. For the representative early 2000's condition in the Snake River region, the IEAB's personal income estimate amounts to $7 million, or about ½ of 1 percent of the IEAB's regional total of $140 million. Therefore, the comparison is $7 million of personal income versus Reading's $196 million of expenditures and $544 million of output in Idaho.

Second, Reading's impact estimates are based on a much higher level of fishing effort than the IEAB's estimates. The IEAB reports on regional economic impacts for a representative early 2000's condition. The Snake River region received returns of 7.67% of spring/summer chinook and 17.828% of steelhead, amounting to 13,714 and 45,020 spring/summer chinook and steelhead, respectively. Two days of effort per fish were assumed, so about 27,400 and 90,000 days were assumed for chinook and steelhead, respectively, or 117,400 days total.

The level of fishing effort assumed for Reading's restored Idaho fishery far exceeds levels used in the IEAB analysis. In Reading's Idaho restored fishery study, it was assumed that 271,000 and 177,000 trips would be taken for salmon and steelhead, respectively. Days per trip information are not provided, but a sample of anglers in 1997 spent an average of 1.96 days on their first trip and 1.56 days on their last trip, or about 1.76 days per trip (Reading 1999). If 1.76 days per trip is applied to the restored fishery trips, then 477,000 and 311,500 days would be taken for the two species, or 788,500 days total, 6.7 times the number of days used in the IEAB Early 2000 conditions (117,400).

Third, the two studies use different measures of economic effects. Reading's Idaho fishing study impacts are expressed in terms of total expenditures and output; IEAB impacts are total personal income. Expenditures and output are very different from personal income. Personal income is a share of total expenditures or output. It is the share of expenditures or value of output paid as wages, salaries, rents, profits, interest, dividends and other proprietor's incomes to persons in the region. Reading does not report total personal income effects in any of his studies. However, we can estimate what the personal income effects should be based on his direct expenditure effects.

A regional economic analysis of recreational fishing starts with the direct expenditures of anglers. The share of direct expenditure in the retail sector that is the cost of goods sold is usually subtracted directly from the expenditure estimates. For retail expenditures, a large share of the expenditure is required to cover the cost of goods sold. Most of this cost does not indirectly generate any local personal income because in modern economies most goods for sale are imported into the region. In grocery stores, for example, the "margin" between cost of goods sold and the amount actually paid by customers is between 10 and 30 percent.

An Input/Output (I/O) model starts with the margin and calculates the share of remaining expenditures that becomes personal income paid within the region and the share that becomes sales to other industries in the region. Under normal conditions, about one third of that margin becomes direct personal income. The other two thirds of the margin are paid to buy local support services. These shares result in economic multiplier effects in the region. The personal income share results in "induced" effects because some of personal income is respent in the region. The share paid to other industries results in "indirect" effects because the other industries increase their expenditures in the region. The re-spending by support services and direct personal income in the local economy result in multiplier effects.

The other angler expenditure categories are largely services, such as lodging, restaurants, or guide services, which may be modeled directly through the appropriate sectors. For these and other services, some of the expenditure is needed to cover costs of capital and materials that are imported. Therefore, personal income returned to the local region directly is less than direct expenditure. With multiplier effects, however, total personal income effects are increased.

Reading provides a breakout of 1997 survey expenditures by type in another publication. For the first trip, transportation, grocery costs, supply costs and equipment costs – all expenses from retail sectors – were about 73 percent of all expenses. On the last trip, these expenses were about 75 percent of all expenses. Expenses for services – lodging, restaurants and guides – were only about one-quarter of the total. Guide expenses, a category that certainly results in large local personal income effects, was only 2 percent of expenditures on the first trip and less than 1 percent on the last trip.

After adjusting for these three factors, results of the two studies are comparable.

For the IEAB Early 2000s condition, personal income was $60 per day of fishing or $7 million in the Snake River region. The Reading study estimates $196 million of direct expenditure at the State level. First, we adjust for the difference between the IEAB's early 2000's condition and Reading's restored fishery condition. Dividing Reading's expenditure effects by the estimated ratio of trips (6.7) gives $29 million ($196/6.7) of expenditures.

Next, we estimate what amount of personal income might be generated by these direct expenditures. $100 of direct expenditure in retail stores will probably generate a total of

direct, indirect and induced personal income of $30 to $40 at the state level. We assume that each $100 in direct expenditures in services could generate $50 to $100 of state personal income. We assume that 75% of direct expenditures occur in retail sectors and twenty-five percent of expenditure occurs in services. Therefore, expected personal income per $100 of expenditure is $35 ($30 times .75 plus $50 times .25) to $55 at the State level, and the personal income associated with adjusted $29 million of expenditure is then $10 to $16 million at the State level. This $10 to $16 million range is reasonably close to the $7 million of personal income estimated in the IEAB study.

Appendix 2. Why Economic Impacts are Not Benefits

Policy-makers and the public often assume that economic impacts and benefits are the same thing, or that they are at least closely related. While they are related, they are different enough that economic impact numbers should not be represented as being economic benefits. In some cases, the misinterpretation of economic impacts as benefits can lead to incorrect conclusions and decisions about regional economic policies and development.

Economic impacts are the amount of money changing hands: the dollar value of a transaction. Economic benefits are the net value associated with a transaction.

Economists perform benefit/cost analysis to calculate net benefits and costs that may accrue to a defined group of people from a change such as improved fishing. There are generally two types of benefits. Benefits in production and sales are revenues net of costs. Benefits for final consumers are willingness to pay net of what was actually paid.

Economic impact estimates include some measures of revenues and costs, so they can be useful in estimating benefits. Impact studies typically utilize input-output analysis (I-O). On the production side, I-O provides some information on the difference between revenue and cost for each industry. Wage and salary incomes, proprietor's incomes, rents and dividends represent returns to labor, management, capital, land and risk. These production costs are also incomes that can be totaled to obtain personal income. Even personal income is not a benefit, however, because (1) some of the costs of resources and opportunity costs needed to obtain personal income are not counted, and (2) changes in personal income paid in a region may not be paid to persons who, before the change, lived within the region. Personal income is clearly closer to regional benefits than output or expenditure, but it is not the same thing.

In I-O, the impacts of all incremental changes are calculated using the same cost shares as the pre-impact average. In truth, an incremental change that creates more business activity such as restored salmon runs is likely to result in cost shares that are very different from the pre-impact average. Often, unemployed persons in the region do not have the skill sets or other resources needed to meet an increase in demand, so a larger-than-average share of resources needed for the new business must be imported. The result is that a larger-than-average share of new income is paid to persons who were not formerly residents of the region and I-O overstates the economic impact of the incremental change on local populations.

Some types of benefits are not revealed by the dollar value of transactions.

Economic impact analysis provides little or no information about final consumer benefits and a variety of benefits or costs related to costs and quality of life are simply not covered.

Regional residents are concerned with their personal income, but there are many other factors that affect their net benefits. A change such as restored salmon runs may reduce their expenditures for fishing; a benefit, from their perspective. Cost of living and quality of life considerations are not usually counted or considered by economic impact studies.

Economic impact estimates normally count the value of transactions that occur within a region. Economic benefits count costs and benefits for a specified group of people.

Input-output models normally count incomes paid by business activities that operate within a region. Some income is paid to within-region households, and any income paid to non-residents can be represented as an import of services into the region.

Economic benefit analysis usually focuses more on a specific defined group of people. From the perspective of regional residents, payments for imports do not count as income and should not figure into the benefits for residents.

Of particular relevance to this case, I-O models do not provide information about how changes in fishing opportunities affect regional spending patterns. Recreational activities, like salmon fishing, draw upon both local and imported inputs. Inputs to angling include fishing gear, boats, fuel for travel from home to fishing sites, and food and lodging during longer trips. For non-resident anglers, some of their expenditures for fishing in Idaho will occur before they leave home, and some will occur on the way to Idaho, but not in Idaho. Purchase of items produced in Idaho (bait or camping sites) will generate larger local income impacts than purchase of items produced elsewhere (like fuel). If an improved salmon run in Idaho attracts more anglers from neighboring states and encourages more Idaho-based anglers to stay home and fish in-State, the increased expenditures will trigger a positive income impact in Idaho.

When anglers from Idaho go fishing in Idaho, however, there will be an economic impact in Idaho only to the extent that their expenditures represent increased spending in Idaho. Perhaps the new fishing opportunity will keep Idahoans from taking their fishing trips out-of-state. If, however, anglers in Idaho would have spent the money on some other activity in Idaho, the effect will be a shift in income generated from those other activities to income generated by angling. A shift of expenditures from other recreational activity to fishing, or from one type of fishing to another (e.g. from trout to salmon fishing) will not cause any State-level income impact in Idaho. So, the analysis must determine how recreational patterns in Idaho will respond to a larger salmon run and the extent to which the new levels of activity represent new spending in Idaho.

Therefore, an economic impact assessment must include a study of angler expenditures and the inter-regional trades involved. Based upon this framework, the two primary steps in developing an economic impact assessment of an improved salmon run are: (1) produce a forecast of the increase of in-State angling activity that will be triggered by the increased salmon run, and augment this with an estimate of increased in-State spending; and (2) determine the income impact due to this increase in expenditures in Idaho caused

by the increased angling activity. For analysis of benefits, some additional analysis is required; in particular, how much of the income represents a shift from other Idaho expenditure, how much of the income impact will be paid to Idahoans, what was the value of other opportunities lost because of the income-earning activity.

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