

12.0 Compensatory Actions

12.1 Introduction & Study Organization

The purpose of this analysis is to describe and document the potential mitigation and/or compensatory actions that could be undertaken to alleviate the impacts associated with the study alternatives under consideration. There are two types of potential mitigation and/or compensation actions that are addressed in the following discussion:

1. Legally required mitigation actions, which are included in implementation costs:
 - Fish & wildlife programs,
 - Cultural resources, and,
 - Tribal responsibilities.
2. Potential mitigation or compensation actions which are not legally required:
 - Mitigation activities which may be economically viable and socially desirable - if the combined cost of the mitigation plan and resulting reduced impacts are less than the initial impacts, the plan meets the requirements of being “reasonable and prudent” in an economic sense.
 - Compensation activities, which may be socially desirable, include areas where losers may be “made whole” by compensating them for losses.

The Corps process for determining NED impacts accounts for the most efficient (or least cost) way of accommodating changes in water budget utilization from the national perspective. In most cases, the national estimate of impacts documents the potential net increase in costs (or benefits) but does not provide a means to compensate or mitigate for the losses.

In addition, there may be significant regional costs that are not taken into account in the national impact estimates.

The decision to fund mitigation and compensation plans is ultimately a political decision. The goal of this report is to identify a menu of mitigation and compensation efforts for decision-makers by documenting quantifiable NED impacts and qualitative regional impacts that may be considered to mitigate and/or compensate losses.

The following section provides a description of legally required mitigation costs and other potential mitigation/compensation costs. The primary purpose of the economic appendix has been to evaluate the costs associated with enhancing the survival and recovery of Snake River ESUs. Earlier PATH biological output (e.g., 1998 model results) suggested that the dam breaching alternative was the only alternative, which satisfied most of the NMFS jeopardy standards, especially for the 48-year recovery standard for Fall Chinook. However, newer PATH model results indicate that the dam retention alternatives also meet the NMFS jeopardy standards. As a result, the mitigation and compensation actions suggested below may not be required to enhance the survival and recovery of Snake River ESUs. They are, however, documented in this chapter to illustrate what actions may be considered, if dam breaching were the selected alternative.

12.2 Description of Legally Required Mitigation Costs

Legally required mitigation efforts include fish and wildlife mitigation and cultural resources protection efforts, which are required to mitigate disruptions that would be caused by the dam breaching alternative (A-3). Dam retention alternatives (A-1, A-2a and A-2c) do not require new legally required mitigation. However, previous mitigation projects, put in place when the dams were constructed, would remain under all alternatives.

12.2.1 Fish & Wildlife Mitigation

Fish and wildlife mitigation, which is legally required by the Fish and Wildlife Coordination Act, is estimated to cost \$20.7 million per year over the 100-year study life for the dam breaching alternative (A-3). This estimate is presented in year 2005 dollars and is based upon discounting at the 6 7/8% discount rate. (See Table 12-1.) Mitigation for fish and wildlife impacts related to the dam breaching alternative (A-3) would include:

- structure modifications - such as existing livestock watering facility modifications, maintaining road access to existing habitat management units (HMUs), and modifications to fish hatcheries, among other items,
- vegetation restoration - such as seeding the exposed banks of the river with grass, propagation of plants and willows, and noxious weed control, among other items,
- maintenance of existing habitat management units - primarily developing alternative water sources or modifying systems for existing HMUs, and,
- monitoring of ongoing work to see how fish and wildlife species and vegetation are developing – efforts include conducting a seasonal bird census, nesting surveys, and habitat evaluation monitoring, among other items.

12.2.2 Cultural Resources Protection & Tribal Responsibilities

Cultural resources preservation entails preserving and protecting cultural sites (e.g., burial grounds and other culturally significant sites) after the dams are breached. The cost to protect cultural resources includes grading and preparing sites (e.g., preparing seed beds, undertaking bank stabilization, placing appropriate signage and installing security fencing, as needed on a site-by-site basis). Cultural resources protection is expected to cost \$4.9 million per year over the 100-year study period. This estimate is presented in year 2005 dollars and is based upon discounting at the 6 7/8% discount rate. (See Table 12-1.)

Table 12-1. Legally Required Mitigation Costs for Dam Breaching Alternative – A-3 (in 1,000s of 2005 dollars)

Component	Cost
Fish & Wildlife Mitigation Costs	\$20,772
Cultural Resources Mitigation Costs	\$4,924
Total	\$25,696

Note: Average annual amounts based upon 6 7/8% discount rate
Source: U.S. Army Corps of Engineers, Walla Walla District

12.3 Description of Other Potential Mitigation/Compensation Costs

Non-legally required mitigation activities are defined to include:

- Mitigation activities, which may be economically viable and socially desirable (e.g., areas where impacts could be diminished or mitigated), and,
- Compensation activities, which may be socially desirable (e.g., areas where losers may be compensated for losses or “made whole” by compensating them for losses).

The following section describes both the potential quantifiable and qualitative impacts, where mitigation and/or compensation efforts could be considered.

12.3.1 Implementation Costs

The cost of implementing the study alternatives ranges dramatically across alternative. Under the dam retention alternatives, implementation costs are expected to increase modestly (e.g., costs increase by approximately \$5.9 million per year under alternative A-2c [major system improvements] as compared with the existing conditions - A-1). However, under the dam breaching alternative, implementation costs are expected to increase by nearly \$8 to \$49 million per year, depending on the discount rate (Table 12-2).

Table 12-2. Summary of NED Costs (in 1,000s of 1998 dollars)

Discount Rate	Implementation	Power*	Navigation	Irrigation/ Water Systems	Total Costs
@6.875%					
A-2a	(\$3,457)	(\$8,500)	\$-	\$-	(\$11,957)
A-2c	\$5,931	(\$8,500)	\$-	\$-	(\$2,569)
A-3	\$48,787	\$271,000	\$ 24,034	\$ 15,424	\$359,245
@4.75%					
A-2a	(\$2,556)	(\$8,500)	\$-	\$-	(\$11,056)
A-2c	\$4,376	(\$8,500)	\$-	\$-	(\$4,124)
A-3	\$35,498	\$267,500	\$ 25,249	\$ 10,746	\$338,993
@0.0%					
A-2a	(\$663)	(\$8,000)	\$-	\$-	(\$8,663)
A-2c	\$1,390	(\$8,000)	\$-	\$-	(\$6,610)
A-3	\$8,298	\$263,500	\$ 28,330	\$ 2,241	\$302,368

* Equals increased alternative power costs less avoided costs (e.g., turbine rehabilitation costs for the dam retention alternatives).

Source: U.S. Army Corps of Engineers, Walla Walla District and various FR/EIS study teams

There is currently no method to pay these implementation costs, which could be integrated into a mitigation/compensation strategy.

12.3.2 Power Mitigation/Compensation Actions

The overall cost of producing power (e.g., including system transmission reliability and ancillary services costs) is expected to decrease slightly under dam retention alternatives (A-2a and A-2c) as compared with the existing conditions (A-1). Under the dam breaching alternative, the cost of alternative power is expected to increase by approximately \$263 to \$271 million per year over the 100-year study period, depending on the discount rate.

The economic impacts of power rate increases are expected to be widely distributed in varying degrees amongst the electric ratepayers throughout the WSCC region (e.g., WSCC comprises all or part of the 14 Western States and British Columbia, Canada). However, the Pacific Northwest region is likely to be the most impacted sub-region based on the regional system production costs. It is expected that the power rate impacts to each individual electric ratepayer could fall within a wide range of possibilities.

No possible mitigation measures were identified in the hydropower analysis. To mitigate for the increased power system costs some alternative way of meeting power demands (loads) would need to be identified. However, the hydropower analysis identified the most cost-effective way to meet power loads with each of the alternatives. Any possible mitigation plan would be more costly and hence would not mitigate the impacts, but only change them to some other mix of power resources.

Subsidizing each ratepayer an amount equivalent to the impact could compensate the economic effects of potential power rate increases. This could come from the nation's taxpayers to the regional ratepayers, which would require congressional authorization. This compensation would constitute a transfer of the economic effects from one region of the country to the entire country.

12.3.3 Navigation Mitigation/Compensation Actions

The loss of barge transportation under the dam breaching alternative would likely lead to an increased use of alternative (and more costly) cargo transportation systems. This would entail longer truck travel to more distant barge terminals or a shift to rail transportation services. The net NED costs incurred by cargo shippers are expected to be approximately \$24 to \$28 million per year for the 100-year study period, as shown in Table 12-2, depending on the discount rate.

According to the Transportation team, shifting from the existing transportation system to the next less costly system would increase overall grain transport costs by approximately 19% per bushel.

However, the magnitude of the NED costs does not take into account a potential rate adjustment by railroad carriers in response to the loss of competition by the barge lines. There is a general concern among shippers that the railroads may raise their rates affecting the cargo currently moving by barge as well as some cargo that is currently carried by rail. If rail rates were raised, the additional cost to farmers would be a wealth transfer from farmers/exporters to the railroads but would not be considered a NED cost.

In addition to these additional NED costs, there are also additional expenditures that would be required to improve the transportation infrastructure. As shown in Table 12-3, the cost to upgrade railroads, highways and storage facilities could range from \$210 to 535 million. The transportation analysis assumes that the existing rate structures would generate sufficient funds to pay for these improvements.

Table 12-3. Summary of Estimated Costs of Infrastructure Improvements (in Millions of 1998 dollars)

Infrastructure Improvements	Low	High
Mainline Railroad Upgrades	\$14.0	\$24.0
Short-Line Railroad Upgrades	\$19.9	\$23.8
Additional Rail Cars	\$14.0	\$26.9
Highway Improvements	\$84.1	\$ 100.7
River Elevator Capacity	\$58.7	\$ 335.4
County Elevator Improvements	\$14.0	\$16.9
Tidewater Rail Car Storage	\$5.3	\$7.4
Total	\$ 210.0	\$ 535.0

Source: Transportation Chapter, Table 3.3-19

In addition, other components of the barge industry transportation system could experience losses in income from:

- Commercial barge companies - foregone revenue and idle capacity,
- Selected grain elevators - loss of revenue, idle capacity,
- Selected port districts - loss of revenue, idle capacity,
- State and local governments - additional road and highway maintenance costs and possible loss of tax revenues.

There is no current means to mitigate or compensate for these potential NED costs, wealth transfers and qualitative losses.

12.3.4 Irrigation and Municipal/Industrial Water Supply Mitigation/Compensation Actions

The NED costs for irrigation and water systems have been estimated at \$15.4 million per year at a discount rate of 6 7/8%. This measure of impact assumes that:

- the value of the farmland would be reduced due to the loss of irrigation,
- municipal and industrial pump stations will need to be improved, and,
- privately owned wells will need to be replaced.

There is no current means to mitigate or compensate for these potential NED costs. Potential mitigation/compensation efforts could include:

- payment for required improvements, and,
- potential purchase of farm land.

12.3.5 Social Mitigation/Compensation Actions

The long-term employment losses across the Pacific Northwest could be approximately 5,338 to 6,008 jobs as a result of implementation of the dam breaching alternative (A-3), according to the Social Analysis Report. The total jobs gained under A-3 are forecast at between 3,796 and 4,722 after 20 years. Approximately 4,000 of the job losses represent identifiable dislocated or displaced workers. Overall adverse community level social impacts include the following:

- Decrease in net farm income and increased financial pressure on dryland farmers throughout the region.
- Increasing consolidation of family farms and a decrease in rural farm population.
- Decrease in county property tax base in 20 regional counties
- Dislocated workers from Ice Harbor Irrigated agricultural lands and loss of source of local school revenue.
- Shift in the economic base of communities and changed potential for future growth.

Many of these significant community level and employment impacts are caused by the increased costs of grain transportation and by the loss of irrigated agriculture on the Ice Harbor Reservoir, which would occur under the dam breaching alternative (A-3). These impacts could be minimized in part by modification of the irrigation pumps and direct upgrades to expand rail capacity in the region and/or a direct subsidy to the farms currently shipping on the lower Snake River, as discussed in previous section.

In the absence of direct mitigation to impacted parties for increased transportation costs, loss of irrigation water and other impacts discussed above, employment losses could be addressed by providing targeted job retraining and education credits, at an estimated cost of between \$45.1 million and \$48.1 million.

Potential mitigation for 82 affected communities has been estimated at between \$4.3 million and \$12.9 million. Community level impacts could be addressed by providing block grants to affected communities in the region for economic diversification activities. For example to mitigate farm communities most affected by the loss of river transportation, economic development programs could be utilized to create more local value added products and decrease the dependency on the export of unprocessed grains to foreign markets.

Under A-2, the lower probability and higher degree of risk associated with anadromous fish recovery may lead to negative economic and social impacts to sport fishing-dependent communities. These communities may lose an important component of their economic base and may need assistance to transition to another non-fishery dependent job base.