

A LETTER FROM JAY MANNING

November 2006

The Honorable Christine Gregoire, Governor
and Honorable Members of the Washington State Legislature
Olympia, Washington

Dear Governor Gregoire and Ladies and Gentlemen:

With the passage of House Bill 2860, the State of Washington is fundamentally changing how the state manages water in the Columbia River. By enacting this landmark legislation, the Legislature and the Governor endorsed a new mission for the Department of Ecology: to aggressively pursue new water supply in the Columbia Basin that benefits the state's economy, communities, and natural environment. The new law has broken through decades of legal and administrative gridlock and is backed by a significant financial investment.

The law links the state's efforts to address instream and out-of-stream needs so that progress for one results in progress for both. It also emphasizes the importance of local and tribal governments, water users, the environmental community, federal agencies, and other stakeholders in developing a long-term, integrated and strategic water supply plan for the Columbia River. At the same time, the law asks these decision-makers to work across jurisdictional boundaries to address a variety of needs: fish and agriculture, economy and environment. And it creates a model that rewards collaborative effort with the promise of timely and sustainable results.

This report describes the state's new approach to managing the Columbia's water resources. To meet the promise of the law, the new program must improve the availability and reliability of water during the times of the year that it is needed most, and this report documents our efforts to create an effective, efficient, and equitable program.

This report is a beginning: presenting a first look at what water is being used now, what water may be needed in the future, and what the state can do to secure reliable and cost-effective supplies. Over time, we will need to refine our strategies and our investments as we develop a more sophisticated understanding of how to manage Columbia River water. We must also keep a watchful eye on future risks to water supplies from the Columbia River, including emerging demands from our own growing population and economy, new uses in neighboring states and Canada, the potential effects of actions taken by the Federal Columbia River Power System, and the threats posed by a changing climate.

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For the present, we must quickly deliver on-the-ground results in the Columbia Basin. A great deal of work lies ahead, for both Ecology and our partners, but I am extremely pleased by and proud of our progress to date:

- Policy Advisory Group successfully formed
- \$18 million committed to supply evaluation studies
- 4 mainstem storage sites selected for further study
- Supply & Demand/ Inventory reports on schedule
- DEIS prepared and released in 111 days
- 2000 acres of Odessa to receive water – Spring 2007
- Potholes supplemental feed route test in upper Crab Creek underway

Already, we are aggressively pursuing a number of cost-effective water supply projects to improve reliability now and in the future. We will issue new water rights and concurrently ensure that promised benefits for the natural environment are in place. We are developing the data and management capacity to demonstrate and maintain our success over time.

In closing, I offer my gratitude to the members of the Columbia River Policy Advisory Group who are investing long hours to ensure that Ecology's implementation of the law is consistent with its spirit. I would like to express my appreciation to tribal governments and their staff who have joined in this effort in good faith. In addition, I would like to thank the many other stakeholders who have spent years advocating for their needs and interests, and the ways in which environmental and economic water uses might begin to complement each other. We will need assistance from all of these partners, and many others, in order to achieve the promise of this new program.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jay J. Manning". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Jay J. Manning,
Director

EXECUTIVE SUMMARY

This first legislative report under the Columbia River Water Management Program (Management Program) is an opportunity to share the first steps towards implementing Engrossed Second Substitute House Bill (ESSHB) 2860, codified in RCW 90.90. The Legislature set an ambitious schedule for this report and, since the legislation became effective on July 1st, Ecology has hit the ground running. The scope of this report includes two key elements required in RCW 90.90.040:

- A Columbia River water supply inventory (due November 15th, 2006 and updated annually); and
- A Columbia River long-term water supply and demand forecast (due November 15th, 2006 and updated every 5 years).

ESSHB 2860 prioritizes Washington State's water needs from the Columbia River, focusing Ecology's efforts on supplying water to fulfill the need to:

- Replace ground water use from the Odessa Subarea aquifer;
- Approve pending water right applications;
- Convert interruptible water rights to uninterruptible water rights; and
- Issue new municipal, domestic, industrial and irrigation water rights.

In order to supply these needs, the Management Program described by ESSHB 2860 involves funding storage and conservation activities that will result in water savings to the mainstem of the Columbia River. However, before projects can be funded, they first must be identified.

"The legislature finds that a key priority of water resource management in the Columbia River Basin is the development of new water supplies that includes storage and conservation in order to meet the economic and community development needs of the people and the instream flow needs of the fish."

ESSHB 2860, Section 1(1)

Columbia River Water Supply Inventory

The inventory presented in this report is an important component of the legislation. Ecology's mission to aggressively pursue new water supplies in the Columbia Basin that benefit the state's economy, communities, and natural environment includes storage and conservation as tools to develop the new water supplies. The inventory is intended to identify and describe the range of projects available to meet these goals, and allows them to be screened and ranked. The inventory provides the foundation for making the best use of funding provided by the Legislature.

Long-Term Water Supply and Demand Forecast

The Columbia River is a dynamic regional water course. Its management is complex and multi-jurisdictional, involving multiple state, local, and tribal jurisdictions, as well as multiple border jurisdictions such as Canada, Idaho, and Oregon. Over time, changes in international or interstate agreements, or changes in climate or other factors, may affect the timing and quantity of water flowing in the Columbia River. Population growth, economic development and

other changes in demand for water from the Columbia River will also affect the water budget. In this dynamic environment, keeping abreast of these changes is especially important. As a result, Ecology has been directed to provide periodic updates to the legislature on the water supplies and demand and will make forecasts to aid recommendations for the future. This will help ensure that as changes come, the State of Washington will be better prepared for those challenges.

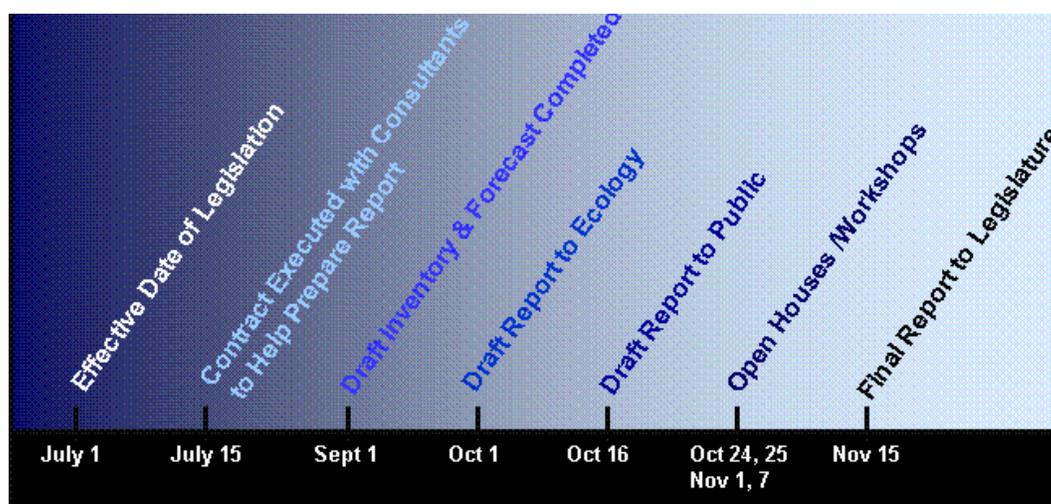
Report Schedule

This report marks the culmination of an aggressive 4 month effort by Ecology to meet the requirements of RCW 90.90.040. Given the time available from the enactment of the statute to the completion of this inventory and water supply and demand forecast, Ecology determined that it was critical to contract portions of this work with organizations with expertise in the subject at hand, i.e. irrigated agriculture, water supply and use, and

conservation. Golder Associates Inc., Anchor Environmental, the Washington State Conservation Commission and Washington State University were selected and each contributed substantially to the information presented in this report. The figure below shows the schedule for completing this report and submitting it to the legislature.

Public Involvement

A central element in the success of the Columbia River Water Management Program continues to be collaboration and transparency with the full range of partners, stakeholders, and governments that have an interest in the Columbia River. To that end, Ecology has developed a comprehensive communication strategy that it will implement over the next year to ensure a high level of public involvement in the Management Program. The following are key portions of the strategy that are raising awareness on this fast-moving program.

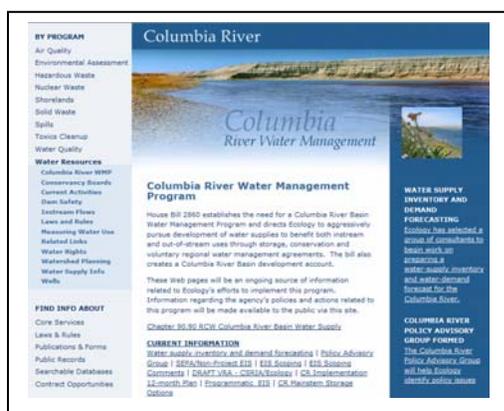


Long-Term Supply and Demand Forecasting Report Completion Timeline

Columbia River Policy Advisory Group

The Columbia River Policy Advisory Group (PAG) is a group of diverse Columbia River stakeholders that will help Ecology identify policy issues associated with implementing the Management Program, provide Ecology with a range of perspectives on policy choices and priorities, and assist Ecology in setting criteria for funding storage and conservation projects. The PAG meets monthly and membership and meeting information is available on Ecology's website:

http://www.ecy.wa.gov/programs/wr/cwp/crwm_p_info.html#policyadvisory.



Columbia River Water Management Program Website

Watershed Planning Units

The Legislature has made a significant investment both in watershed planning and in the Columbia River Water Management Program. Harmonizing these efforts is a key theme in the legislation. To that end, Ecology:

- Has engaged the initiating governments for watershed planning through the PAG and through monthly County Commissioner meetings.

- Has used watershed plans as a source of information for this report.
- Has developed and implemented a training program for its watershed leads to carry the Columbia River message to the planning units.
- Will continue to consult with watershed planning units in the future as elements of the Management Program are implemented.

Public Notice and Public Workshops

Ecology's public involvement efforts over the last 3 ½ months have been inclusive. Ecology created a Columbia River website showcasing its efforts on this legislative report and created an email listserv to provide regular updates on its progress. A press release described the goals of the report and a direct mailing to key stakeholders raised awareness on the project scope and timeline. Ecology also held four open house workshops to receive comments on the draft report. These coincided with the release of the draft Programmatic Environmental Impact Statement (EIS) for maximum visibility and coordination.

Inventory of Conservation and Storage Projects

The inventory of conservation and storage projects is the foundation of the Columbia River Water Management Program. Conservation and storage (both new storage and modification of existing facilities) are options Ecology has been directed to explore in order to meet future demand. Conservation can offer immediate benefits for both existing and prospective water users. Storage, the other component of the Management Program, offers long-term capability to adapt to changes in water demand

forecasted for Washington, and may moderate some of the effects of global warming.

Ecology plans to take a portfolio approach to identify funding opportunities from the inventory that will result in an increase in water supply to the Columbia River mainstem.

Ecology is in the process of working with the PAG to develop selection criteria that it will use to choose projects from the inventory to fund. The criteria will include topics such as the cost-effectiveness, reliability, sustainability, and types of benefits that may accrue from the project. In addition, the selection process will include evaluating and comparing a full range of alternatives based on an economic and environmental review. Ecology will also consider the funding cycle required by the project so that it can maintain a predictable funding cycle. The Legislature will have the opportunity to review projects funded under the Management Program through annual legislative report updates.

A few projects and studies have already begun under the auspices of the Management Program:

- Odessa Study
- Potholes Study
- Mainstem Storage Study
- Lake Roosevelt Drawdown Study
- Walla Walla Pump Exchange Study

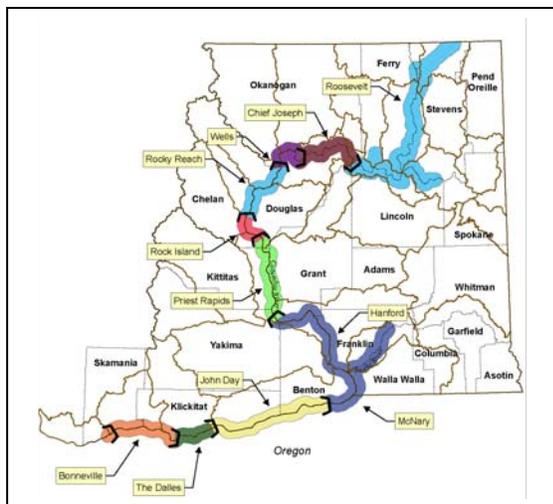
Supporting feasibility and permitting documents for these potential projects are expected to be completed between 2006 and 2010, depending on the individual project.

Additionally, consideration of the feasibility of pump exchange opportunities in the Yakima

Basin is also identified in the Columbia River legislation. Ecology is currently coordinating with Bureau of Reclamation on a Yakima River pump exchange feasibility study along with the Yakima Basin Storage Study.

Management Units

Defining appropriate geographic units to organize the large amount of relevant water resources information for the Inventory was challenging and will likely continue to be an issue for the Columbia River Water Management Program. Water resources information is compiled, aggregated, and reported at different physical and socio-political scales—by state, County, WRIA, tributary, river reach, service area, irrigation district, and other spatial units. The ability and authority to manage water resources varies at similar scales. An important goal of the inventory and forecast was to compile and present information at a common scale, where conservation, storage, water use, and water availability data are comparable and consistent. After reviewing the various forms of data available, a County scale was selected as the most common management unit for available water-related data because nearly all of the available information can be presented and aggregated by County. In some cases, the information can also be presented for the one-mile zone around the Columbia River for each County. WRIA reaches that divide the Management zone by WRIA boundaries are a secondary management unit. There was not sufficient information compiled by WRIA to use them as primary geographic units. Pool reaches (the reach of the river between two dams) are a third management unit.



Geographic Management Units for the Columbia River (County, Pool Reach, WRIA, Pool)

Conservation Projects Inventory

Ecology's initial effort at developing an inventory has yielded more than 5,000 potential agricultural conservation projects. The projects, identified through surveys conducted by the Washington State Conservation Commission and through existing Irrigation District Planning documents, have the potential to save almost 1 million acre-feet of water.

About half of the conservation districts in the region participated in the survey and, together, identified over 5,000 potential conservation projects. The majority were on-farm conservation projects. Several canal lining/piping projects were identified and a variety of other projects were identified including tailwater reuse, storage, irrigation water management, surface to groundwater conversion, and water right purchase projects. The total estimated water savings (consumptive and non-consumptive) from projects identified by the Conservation Districts are approximately

530,000 acre-feet with a total estimated cost of \$663,000,000. The average cost per acre-foot for the projects is approximately \$1,250.

Conservation District Inventory Results

- 5,315 projects
- Approximately 530,000 acre-feet of estimated water savings (consumptive and non-consumptive)
- Total estimated cost of \$663,000,000
- Average cost of \$1,250 per acre-foot

Over eighty projects or groups of projects were identified through the irrigation districts. Most were lining/piping projects, followed by storage or re-regulation reservoir projects, water management projects, and on-farm water conservation projects. The total estimated water savings are approximately 425,000 acre-feet with a total estimated cost of \$450,000,000. The average cost per acre-foot for the projects is approximately \$1,100.

Irrigation District Inventory Results

- 82 projects
- Approximately 425,000 acre-feet of estimated water savings (consumptive and non-consumptive)
- Total estimated cost of \$450,000,000
- Average cost of \$1,100 per acre-foot

The two important considerations for the agricultural conservation inventory are: 1) the costs and water savings presented should be viewed as preliminary and used only to screen or compare projects within the inventory; and 2) the volume of water conservation that is likely to actually accrue to the Columbia River is currently expected to be less than the total volume from the conservation opportunities that have been identified. This result is likely because of a variety of challenges with the

delivery of conserved water to the mainstem of the Columbia River.

Potential municipal conservation projects were identified by reviewing water system plans of the largest municipalities within the Management Zone. An inventory of the Washington Department of Health's (DOH) database on Group A and Group B water systems was also conducted. Finally, a review of water reuse in Washington was prepared, including demonstration projects. The total conservation potential from municipal entities is difficult to estimate. Actual reported volumes of conservation are much lower than what was identified for agriculture, but it is likely that municipal conservation is under-reported in existing documents. It is expected that future inventory reports to the legislature will include more ambitious and comprehensive estimates of municipal water conservation savings in response to the requirements of the Municipal Water Bill.

While the initial number of potential conservation projects is encouraging, subsequent reports are expected to generate many more conservation projects as additional sources of information are investigated over a longer review period. Ecology's next challenge is to identify which of the inventoried projects best balance the program goals of benefiting instream resources and mitigating new permits from the Columbia River.

Storage Projects Inventory

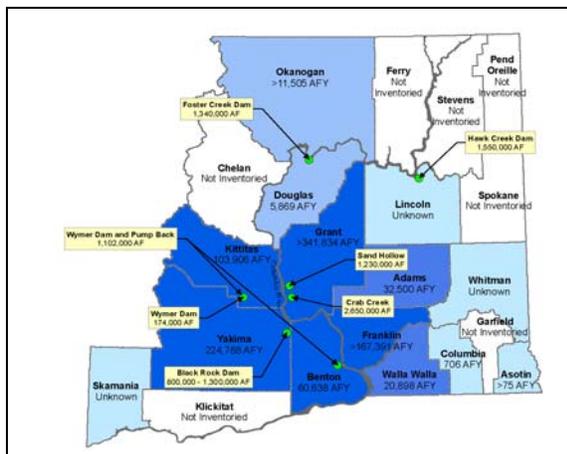
New large-scale storage projects have long been contemplated in Eastern Washington. The

Columbia River bill recognized the compelling need to consider storage projects as a part of a portfolio strategy for water supply. In this report, storage inventory results were split into categories consistent with the Draft Programmatic EIS for the Management Program: new large storage facilities (> 1 million acre-feet), new small storage facilities (< 1 million acre-feet), modification of existing storage facilities, and aquifer storage and recovery (ASR). Ecology is creating a funding framework that will allow for large and small storage projects to be screened and ranked along with conservation projects to develop new water supplies for the Columbia River.

All of the current large storage options proposed by Ecology and the U.S. Bureau of Reclamation are currently undergoing feasibility studies. The funding, operation, and beneficial uses of these projects have yet to be determined. The large projects inventory includes four projects on the Columbia River (Hawk Creek, Foster Creek, Sand Hollow, and Crab Creek) and two projects on the Yakima River (Black Rock Reservoir and Wymer Reservoir with Columbia River Pumpback). The purposes being contemplated in the Yakima Basin Storage Study include improving instream flow and out of stream supply in the Yakima Basin.

Storage Inventory Results

- 6 storage opportunities (>1 million acre-feet), cost ranging from \$971 to \$4,000 million
- Numerous small (<1 million acre-feet) storage opportunities, many of which did not have a volume or cost estimate



Potential Conservation Water Savings and Large Storage Opportunities

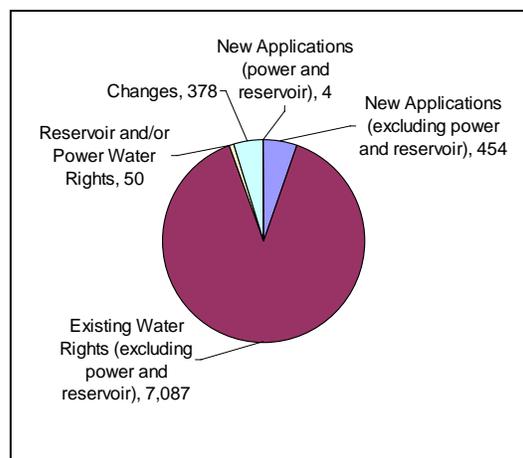
There are a number of small surface storage and aquifer recharge storage projects that also have the potential to meet program goals. These projects were identified primarily through WRIA storage assessment reports. The total volume of potential small storage projects is difficult to estimate. Actual reported volumes are generally lower than what is identified for large projects, but many of the projects are only identified and described in very general terms. It is likely that small storage projects are under-reported in existing documents, and it is expected that future inventory reports will include more ambitious and comprehensive estimates of small storage.

Development of the storage projects identified in the inventory would improve water management capabilities within the Columbia River system. However, a more detailed analysis of each storage project in relation to water demands and the ability to manage demand through conservation is necessary before determining benefits of the projects to the Columbia River. Future legislative reports will summarize the

status of the feasibility and environmental reviews being performed for new storage facilities.

Water Rights Inventory

Current demands made of the Columbia River encompass every beneficial purpose of use considered by the Legislature: power, agricultural, municipal, industrial, commercial, fisheries, recreation and many more. There are 7,087 existing water rights on file in Ecology’s water rights database within the Washington portion of the Management Zone, excluding reservoir and power water rights. On paper, these 7,087 water right holders represent an existing demand of more than 8 million acre-feet. Current actual use is probably less than this amount, and the validity of these water rights was not determined as part of this assessment.



Number of Washington water rights, applications, and changes in the Management Zone

Agriculture uses account for over 79% of the water right quantity in the Management Zone in Washington State. The largest number of water rights is associated with domestic uses, but the

quantity of these rights accounts for only about 7% of the total quantity of water rights issued in the Management Zone in Washington State.

Water Rights Inventory Results

- 7,087 water rights in the Washington portion of the Management Zone totaling 8,194,586 acre-feet per year
- 551 water rights and applications in the Oregon portion of the Management Zone totaling 936,190 acre-feet per year

There are a total of 551 records in the Management Zone for Oregon with a total annual quantity of 936,190 acre feet per year (AFY). This value does not include 116,776 AFY of supplemental irrigation and 5,927,321 AFY of instream non-consumptive uses.



Total Volume (AFY) of Existing Water Rights in the Management Zone

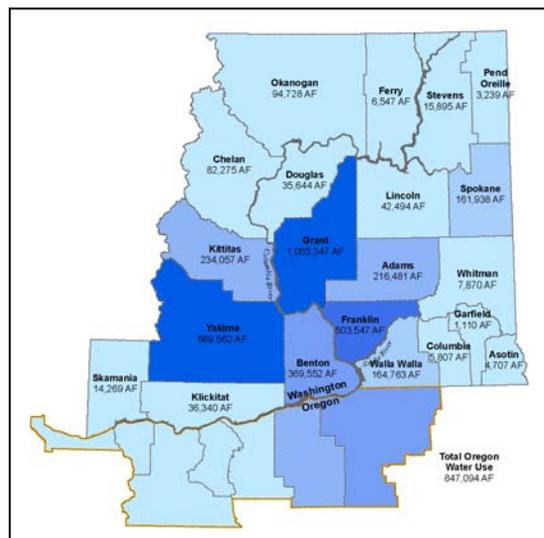
Water Use Inventory

Water use estimates are available from a variety of sources. The USGS conducts a water use inventory every five years, with the last available inventory from the year 2000. Results of the USGS 2005 water use inventory are expected in 2007. Municipalities update water

use every 6 years through their water system plans. Irrigation Districts and other irrigators monitor and report water use in a less prescribed manner. Most WRIA watershed plans contain some information on water use. Because of the disparity in the distribution and consistency of water use information, this initial report relies on the USGS water use estimates to draw comparisons, because they are the most comprehensive and consistent estimates currently available. Total water use in the twenty-one counties in Washington State for the year 2000 was estimated at about 3.8 million acre-feet. The seven counties on the Oregon side of the Columbia River had an estimated use of less than 900,000 AF. It is not possible to determine how much of the water in each of those counties is used within the Management Zone.

Year 2000 USGS Water Use Estimates

- Washington (21 counties): 3,756,172 AF
- Oregon (7 counties): 847,094 AF



Year 2000 USGS Water Use Estimates

The 2000 USGS water use estimates indicate that the largest water use in the Columbia Basin

is irrigation and that irrigation use is concentrated in counties in the Management Zone.

Long-Term Water Supply Forecast

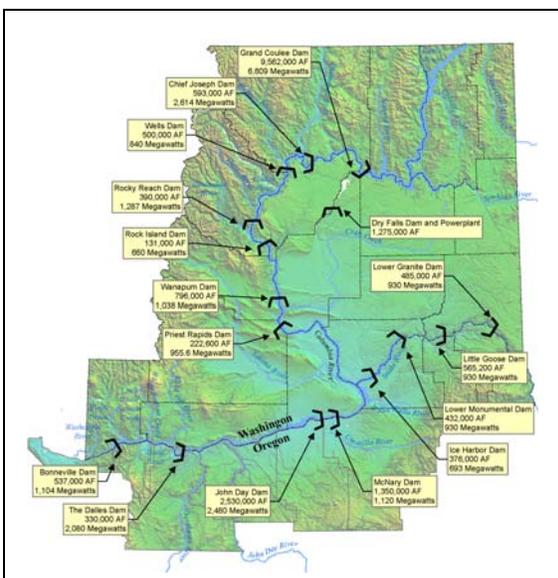
Water supply in the Columbia River varies on many times scales. Fluctuations in river discharge occur hourly in response to changing power demand, daily in response to changes in tributary contributions, monthly as demands of water users vary, seasonally to meet flood control requirements and annually as climate alters the Columbia River watershed hydrograph. The flow regime of the Columbia River has been characterized and simulated extensively by various researchers, hydropower operators, and agencies involved in managing the river.

The existing river management framework, including power management objectives, federal biological opinion salmonid flow targets, gaging and monitoring stations, and regional regulatory issues are described in this report. Of particular interest is the difference between State and Federal management frameworks. On one hand, in-stream flow requirements for the mainstem Columbia managed by the State of Washington differ significantly from Federal flow “targets” specified for fisheries management under the Biological Opinion (BiOp) for Columbia River fisheries. Conversely, instream flow requirements for the major tributaries to the Columbia, also managed by the State, are not uniformly addressed at the Federal level. In addition to Federal hydropower objectives, there is also a Federal component to irrigation. The Columbia Basin Project (CBP) is a major

irrigation project supplying water to over 600,000 acres of land, with the potential to develop an additional 400,000 acres. The effect that these projects have on streamflows in the Columbia River, in relation to the inherent jurisdictional constraints of the Columbia Basin Management Program is a significant element of the future water supply in the region.

Consideration of tribal treaty water rights also must be a part of any management decision concerning the Columbia River. While ceding title to land under treaty, tribes reserved certain rights including the right to hunt and fish in usual and accustomed places (U&A’s). These are rights that were held by the tribe before treaty time and reserved through treaty provisions. Hunting and gathering rights, not yet defined by federal courts, are not limited by the drainage basins and may not exactly correspond to the U and A’s associated with fishing rights. Tribes assert that the treaty reserved right to fish carries with it the implied right to have water in off-reservation streams sufficient to ensure the survival of harvestable numbers of fish.

Interstate and international agreements are another consideration affecting future supply. Although international agreements with Canada and interstate agreements with Idaho and Oregon are present in varying forms, the specificity of those agreements in terms of flow volume has varying levels of predictability. Coupled with the potential for natural changes in snowpack and run-off from climate change, the future supply of water in the Columbia River is not well defined at this time.



Columbia Basin Large Hydropower Dams

Long-Term Water Demand Forecast

Cities on the Columbia River are planning for population growth over the next 20 years or more. The agricultural sector will continue to evolve to stay competitive in a global economy, and power will be needed for future homes and businesses. Concurrently, efforts to improve conditions for fisheries and aquatic health in the Columbia River system are a high priority and significant, both in terms of investment of resources and in terms of what the future hydrology of the Columbia River should be.

The initial water demand forecast was carried out in two formats or “tiers”. The first tier demand forecast is based solely on water right applications on file in Ecology’s WRTS database as of July 2006. While all of the pending applications for new water rights from the Columbia River may not represent viable projects by current applicants (some are 20 years old) and some applications may not be

approved, use of this data is a conservative surrogate for actual demand. Ecology is in the process of verifying the location and characteristics of the applications in the one-mile Management Zone. As Ecology’s data integrity improves and as new applications are received, the number of applications and their projected demand will change. The second tier demand forecast is based on projections of estimated actual water use, and focuses more on “wet” water.

The approach used for the forecasts is not analytically sophisticated and, ultimately, additional work at both the inventory level and the forecasting level is needed. However, there are some meaningful observations that can be made with respect to forecasting demand on the Columbia River, and there are decisions to be made by Ecology and other stakeholders in the basin regarding how to further develop forecasting capabilities in the future and then act on them.

First Tier Demand Forecast

The total demand for water based on water right applications within the 1-mile Management Zone is estimated at approximately 383,000 acre-feet per year.

First-Tier Demand Forecast Estimate

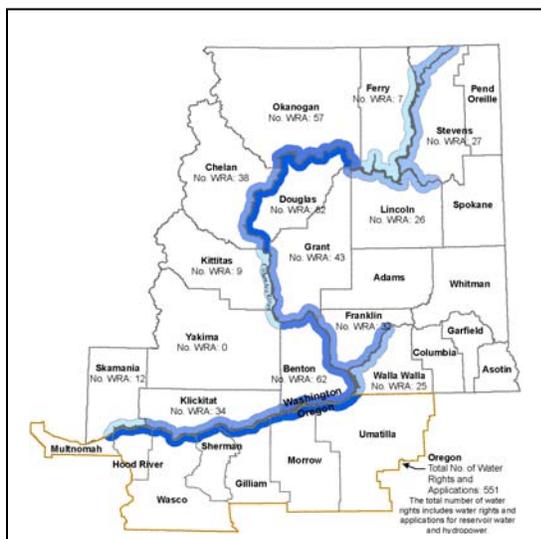
- 454 water right applications
- 383,000 acre-feet

About 56% of that demand is associated with requested irrigation of just over 57,000 acres of land. About 23% of that demand is for municipal/domestic purposes, which could support an additional population of just over

450,000 people. About 21% of that demand is for commercial and industrial purposes, providing a peak demand of 230 cubic feet per second (cfs).

Agricultural demand compared to potential conservation

- Water Demand Estimate: 211,232 AF
- Potential Conservation: 970,000 AF



Total Number of Water Right Applications in the Management Zone

Agricultural water demand associated with water right applications in the Management Zone are estimated at about 211,323 AF, and interruptible agricultural water rights constitute at least an additional 163,000 AF. Potential total conservation amounts are currently estimated at 970,065 AF. While the annual volume of potential conservation relative to pending water right applications is encouraging, there are three important considerations:

1. Only a small portion of the annual conservation potential is likely to accrue directly to the Columbia River. The proportion of conserved water that would

accrue to the Columbia River cannot be determined accurately with available data. Some of the projects identified may result in a high proportion of accrual while others may be very low or negligible because the savings are largely non-consumptive.

2. The 970,000 AF total annual amount of conservation is distributed on a monthly basis, and it is this “instantaneous” amount of conserved water that would need to be “credited” during the peak irrigation season to offset new water rights. After factoring out potential non-consumptive savings described above, this leaves less conservation volume available during the peak irrigation season.
3. Finally, the time lag between a point of withdrawal or conservation and return flow to the Columbia River creates a complex time-varying relationship for determining the benefits of conservation to streamflows. This will further reduce the amount of water conservation savings that would offset new demands from the Columbia River during the peak irrigation season.

The appropriate factors to determine what portion of conservation savings actually accrues to the Columbia are not well defined, particularly on an aggregate basis. However, Ecology’s goal is to match individual conservation projects and water right applications such that conservation savings will provide a basis for processing new water rights.

Agricultural conservation should be matched to specific water right requests on a case-by-case basis to determine the applicable volume of a new water right.

Ecology expects that the inventory of potential conservation projects will expand in subsequent reports. As identification of additional conservation opportunities in future inventories increases, so to does the likelihood that

conservation volumes could offset existing water right applications and interruptible water rights. However, it seems likely that both storage and conservation will be necessary to meet the forecasted agricultural demand for the Columbia River.

Municipal/Domestic demand compared to water right applications

- Water Right Applications: 86,849 AF
- Equivalent population in water right requests: 450,000

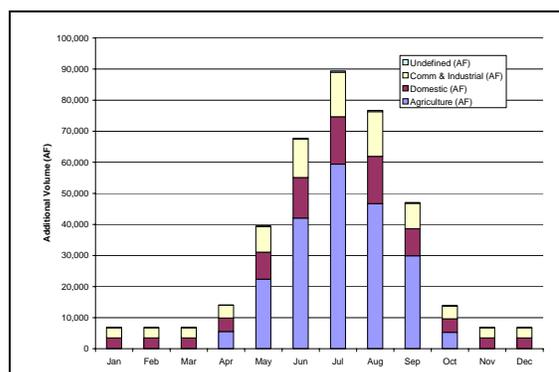
Residential water right applications total an estimated 86,849 AFY. This amount could support an additional population of 450,000 people, assuming 170 gpd per person. Providing water for new population can be considered in two ways:

1. A portion of the new population associated with these water right applications could possibly be served by “maximizing” the capacity of existing rights (through conservation) to meet new demands. This is essentially new population that may not require new water rights.
2. Some portion of the growth served through new water rights could also be permitted through “credits” from new conservation and wastewater treatment/reclaimed water facility return flows. This is essentially new water right capacity that is “conditioned” on conservation commitments and recognition of actual consumptive use.

Similar to irrigation conservation, the appropriate factors and methodology for assigning appropriate conservation to potential new population and/or new water right needs is not well defined. However, if the 1,000,000 people in the Columbia Basin reduced annual per capita demand by 10%, about 19,300 AF of

water would become “available”, which could support new growth of about 110,000 people. Therefore, it does not appear that municipal conservation savings alone would support the projected growth forecast in the pending water right applications. Conservation from other sectors (e.g. agriculture), or storage, will likely be needed to meet projected domestic needs.

It is likely that individual conservation projects and water right applications will be matched so that, when appropriate, conservation savings can be used as a basis for processing new water rights. Furthermore, storage (large, small, or even aquifer storage options) and potentially the use of reclaimed water during the summer months may offer the greatest potential to offset new summer demands (as opposed to simply reducing them), thereby allowing for population growth without new demands on the Columbia River.



Monthly Water Demand Based on Water Right Applications

Second Tier Demand Forecast

The second tier forecast looks at water demand based on historical water use in the Columbia System, focusing on municipal/domestic supply and irrigated agriculture. Washington State

University (WSU) was asked to assist Ecology with agricultural forecasting tools to begin to understand how much additional water demand will be driven by changes in the crops grown within the basin and the land area planted to each crop. The results of the WSU study show little or no change in expected crop acreage in the Columbia River Basin. However, the study could not forecast acreage for a few important crops such as wine grapes and alfalfa.

Projections of future agricultural demand based on actual water use are uncertain and could be higher or lower than current water right applications

- Crop acreage is expected to be stable.
- An upper bound increase of more than 750,000 acres is possible.

A projection of the USGS agricultural water use survey from the year 2000 to the year 2025 was attempted, using a simple single total growth rate to the year 2025. However, it was not possible to develop a sophisticated analysis of growth and validate potential growth in agricultural water use because of a diversity of possible future conditions. For example,

- The WSU study indicated that total crop acreage over the next 20 years will remain stable, though increases or decreases of up to 750,000 acres are possible.
- Water right applications suggest an increase by about 60,000 acres.
- The general “mood” of the WSU survey results was for a stable or declining agricultural demand.
- If the Columbia Basin project were completed to its full capacity, an additional 400,000 of irrigated lands could be brought into production.

Actual future increases in irrigation demands (if they occur) will represent a combination of additional irrigated acres, a transition to more water intensive crops, or a need for more water in response to higher temperatures and longer growing seasons because of climate change. However, it was not possible to develop a more sophisticated approach that includes factors related to conservation, agricultural economics, and climate and validate the estimated growth rate with the inventory data and time available for the initial forecast. With additional time for analysis, future forecasts can examine the more detailed relationships between agricultural water demand and these other factors.

The OFM moderate forecast for population growth indicates that, over the next 20 years, population at a County level will increase from less than 5% to over 30%. On average, 20-year population growth for all counties in the Columbia Basin is projected to be about 20%, or an additional 350,000 people. If only Counties that lie adjacent to the Management Zone are considered, the projected population increase is lower, on the order of 157,000 people. The water supply necessary to support this additional population is about 29,600 AF per year.

Projections of future municipal demand based on population forecasts are lower than current water right applications

- OFM Medium forecast: 350,000 people (all 21 counties)
- OFM Medium forecast: 157,000 people (Management Zone only)
- Equivalent population in water right applications: 450,000 people

Comparison of First and Second Tier Demand Forecasts

In general, it appears that the total demand for water expressed in the existing water right applications exceeds the total demand for water that is likely to occur based on simplistic projection methodologies.

- The demand forecast for irrigation water based on water right applications in the Management Zone (211,000 AF) is greater than the expected basin-wide irrigation demand based on the WSU projection (zero), but less than some of the project-based projections (e.g., 2nd phase of Columbia Basin project).
- The demand forecast for domestic water based on water right applications (86,849 AF) in the Management Zone is greater than the estimated range of domestic water demand both basin-wide (52,500 to 67,400 AF) and for Counties adjacent to the Columbia River (18,800 to 29,600 AF).
- The demand forecast for commercial industrial water based on water right applications (82,237 AF) in the Management Zone is greater than the estimated range of commercial water demand both basin-wide (42,000 AF) and for Counties adjacent to the Columbia River (28,400 AF).

In relation to the goals of the Columbia River Management Program, there are two relevant considerations:

1. First, although there is a discrepancy between water right applications and potential future demand, this does not mean that individual water right applications are not valid or that future total water use will not approach the quantities currently requested in applications.
2. Second, the estimated future water use for both water right applications and expected levels of use are reasonably close to the

conservation savings currently identified in the basin. This, coupled with the possibility of additional storage in the basin, suggests that actual future demands for water can be accommodated in large part through the conservation and storage parts of the Management Program's current strategy.

Next Steps

The Columbia River Water Management Program represents an historic action by the Washington State legislature. Only 4 months into the implementation of the program, Ecology realizes that not all the answers to the water supply questions in Eastern Washington can be found in these pages. What can be found is the spirit of the legislation: collaboration, balance, energy, and optimism. The agency is dedicated to improving the information provided in future inventories and forecasts. In the short-term, there are a number of milestones that can be used to assess progress toward the availability of future water supplies.

Short-term Milestones

- Develop information systems
- Build project-specific partnerships
- Adopt funding criteria
- Create the Columbia River Technical Advisory Group
- Fund and complete needed studies
- Initiate pilot projects
- Press for timely solutions to the needs of the Odessa Subarea

There are also longer term milestones that Ecology has identified through the preparation of this report and external stakeholders have raised during the public comment period. These questions are important to answer in order to ensure the long-term success of the program.

- Long-term Milestones**
- Refine and improve demand forecasting.
 - Expand conservation inventory.
 - Screen and rank conservation projects.
 - Better understand existing constraints on river operations.
 - Explore realm of storage opportunities (new vs. modification of existing, large vs. small, surface vs. aquifer).
 - Measure and verify the quantity of water allocated to both instream and out-of-stream uses.

New Information Systems

Ecology will “establish and maintain a Columbia River mainstem water resources information system that provides the information necessary for effective mainstem water resource planning and management” (RCW 90.90.050). This is a significant undertaking that will enable Ecology, water users, and water resource planners to better understand water use, future demands, and supply alternatives in the Columbia River. It will form the basis for future permitting decisions, water marketing, and regional planning and forecasting.

Ecology is already making significant strides to develop this system. GIS mapping of the water right attributes (e.g. point of diversion and place of use) for all water rights within the one-mile corridor is nearly complete.

Ecology will then focus on:

- GIS mapping of actual use through aerial photo delineation;
- Field verification of the aerial photo delineations;
- Water use metering to better understand actual demand;

- Creating electronic images of water right files;
- Incorporating existing stream gage and monitoring sites; and
- Tracking conservation and storage inventories, including funded projects relative to new permits.



Ecology’s existing well log internet database will serve as the model for the Columbia River water management information system user interface. The goal is to have a user-friendly, interactive system that can be published to the internet by 2009.



Ecology's Online Well Log Database

Building Partnerships

Management of the river is complex and changes to move toward addressing future instream and out-of-stream uses will require partners. Ecology will foster the necessary relationships to make this happen, engaging government entities top-to-bottom, federal to local. We are committed to work across jurisdictions, with sister states and Canada, and with partners in tribal governments. These partnerships will be critical to the future success of our efforts to develop a sustainable water resources management program for the Columbia River as it flows through Washington State.

Adoption of Funding Criteria

While new water supplies are pursued, the Legislature and stakeholders must have continued confidence that the \$200+ million dollars set aside for this purpose are being invested wisely. This month, Ecology issued the draft Programmatic EIS to seek public comment on how money in the program might be spent. The members of the PAG will have a voice in shaping funding criteria, as will county commissioners. Our expectation is that by early 2007, we will have in place a clear and transparent set of funding criteria that can be used to screen and rank an initial list of projects.

Columbia River Technical Advisory Group (TAG)

Ecology expects that evaluating projects will require technical expertise. Consistent with our efforts to involve the full range of interested parties and governments in shaping policy

issues, Ecology is convinced that projects will be more successful if the process by which they are evaluated is open and transparent. To achieve this goal Ecology will establish the TAG as the technical equivalent of the PAG. The TAG will help screen and rank projects identified in this and updated annual inventories for potential funding. It will also provide an open forum for the technical and environmental benefits of projects to be discussed and evaluated.

Future Studies

More work needs to be done to improve future legislative reports. Additional conservation projects can be identified by continuing to work closely with the Conservation Commission, local Conservation Districts, and Watershed Planning Units. Partnering with state institutions will help refine our understanding of future demands and impacts of global warming. Studies of geology within the one-mile corridor will help us understand how big a role aquifer recharge might play in the program. Continued support of storage feasibility studies will refine the storage alternatives down to one or more final sites for consideration.

Projects

The need for future studies is great, but Ecology also recognizes the urgent need to make progress toward improving river flows and issuing new water rights. To that end, we will look for projects in 2007 and 2008 that meet the balanced goals of the bill. Nothing is off the table at this point in time as proposals for pump exchanges, aquifer recharge, water acquisition partnerships, and more, are emerging. Ecology is dedicated to

“aggressively pursuing” opportunities that have the best chance to deliver water supplies that

address both instream and out-of-stream needs at the least cost to the public.