

Action Agency Response to Comments
by the State of Montana on the
2002 Water Management Plan

1.0 Introduction

1.1 Preparation of Plans

Per the BiOps, the Action Agencies will annually prepare a 1-year water management plan that covers FCRPS hydro operations in the upcoming water year. These plans will generally be drafted in July and completed by the end of September. The plan will cover the upcoming water year, which begins on October 1 and ends on September 30 the following year. This one-year plan will be written when very little information is known about the future year's water supply. Therefore, the annual water management portion of the 1-year implementation plan will generically describe how the FCRPS will be operated during the year. This Water Management Plan contains detailed descriptions of special operations at Hungry Horse and Libby Dams. These include VARQ flood control, a sliding scale for storage reservoir refill date to avoid uncontrolled spill and a strategy for smoothing summer flows in the rivers to benefit resident fish as flows are augmented for anadromous stocks.

RESPONSE: *In regard to VARQ at Libby:*

The Corps is working toward implementing VARQ at Libby. The Corps has decided it will conduct an EIS before it can implement VARQ at Libby for the long term.

At the current time the Corps will:

- 1. Conduct studies, coordination and NEPA documentation and prepare a "Phase I" (Decision Document) report by December 2002, which will address whether an interim VARQ operation can be implemented in 2003.***
- 2. Look for opportunities to accelerate the EIS schedule.***
- 3. Consider any alternative actions that could potentially be implemented in lieu of VARQ in 2002.***

In regard to the comment on "a sliding scale for storage reservoir refill date": Modifications to actions described in the Water Management Plan are open to discussion and consideration in the TMT in-season management process. The same general comment applies to a "strategy for smoothing summer flows." Modifications to actions described in the Water Management plan are open to discussion and consideration in the TMT in-season management process.

~~It will also include any special operations (such as any special tests, implementation of VARIABLE Q (flows) Flood Control Procedure (VARQ) at a project, etc.) planned for the year.~~

Text was left in as written. The Action Agencies will also develop more detailed in season action plans to describe how the FCRPS projects will be operated under actual conditions with current water supply forecasts. The first action plan will be prepared in the fall to address the fall/winter operation of the FCRPS projects. A spring update, will be drafted in January and finalized in the March/April time period to address the spring/summer operation of the FCRPS projects. This operating strategy was designed for use with monthly water supply forecasts beginning in January each year and this Plan contains strategies for accommodating forecasting error and unforeseen precipitation events.

RESPONSE: Much of this detail is in the Spring/Summer Update.

1.2 Strategy

1. Reservoir Operations to enhance fish survival: Actions under this substrategy are generally specific project operations that benefit fish at or near the project or its reservoir. Reservoir operations are principally based on local inflows to each storage project. For example, the Integrated Rule Curves (IRCs) developed for Hungry Horse and Libby Reservoirs categorize the inflow volume into quintiles based on the historical record. Each quintile corresponds with a draw down and refill curve for reservoir operation. Reservoir elevation targets are interpolated between the curves based on forecast volume, then updated during the operating year as each monthly forecast becomes available. Calculation of VARQ flood control is similarly calculated, but flood control calculations end after the threat of flooding has past and the reservoir surface intersects the refill curve. Reservoir elevations need to be calculated for the entire year, with specific criteria for adjustments when actual water supplies differ from the forecast.

RESPONSE: While the above statements are correct this is more detail than what the Action Agencies consider necessary in the strategy section. Operations for Hungry Horse and Libby are open to discussion and consideration in the TMT in-season management process. Specific project operations under this substrategy are contained in section 4 of the WMP, including specific operations for Libby and Hungry Horse.

The Action Agencies do consider IRCs, which are similar to VARQ with the exception of the August draft limit. The Action Agencies have implemented VARQ at Hungry Horse and are working to implement VARQ at Libby as described in the response at section 1.1 above.

2. System Flow Management to enhance fish survival: This substrategy includes coordinated system operations for mainstem flow management, ~~and~~ redd protection ~~and~~ also addresses specific river operations below storage projects including Hungry Horse and Libby Dams.

RESPONSE: This is more detail than what the Action Agencies consider necessary in the strategy section. Specific project operations under this substrategy are contained in section 4 of the WMP, including specific operations for Libby and Hungry Horse.

5. Other actions to enhance water management: This substrategy includes water management related actions that are being done to improve fish survival, such as studies, water quality actions and water conservation improvements. Specific research includes the spill test at Libby and evaluating seasonal flow windows and flow ramping rates for bull trout. In the Flathead, research must consider recent developments on the Flathead Lake Drought Management Plan.

RESPONSE: This is more detail than the Action Agencies consider necessary in the strategy section. Specific measures under this substrategy are contained in section 7 of the WMP.

1.3 Changes From Last Year's Plan

Prior to 2001, the Technical Management Team (TMT) had developed annual Water Management Plans. These plans primarily described operations needed to comply with existing biological opinions, as well as relevant factors affecting those operations and any special research operations planned for the year. Similarly, this 2002 Water Management Plan contains most of the operational actions contained in TMT's plans. The operational actions outlined in this plan are intended to help the Action Agencies achieve the performance standards in the 2000 BiOps by improving hydro system survival of juvenile and adult salmon by improving survival of steelhead, white sturgeon, and bull trout. The Action Agencies intend to seek input from TMT on this plan prior to its finalization.

RESPONSE: Text changed in WMP as recommended.

2.0 Hydro System Operation

2.1 Priorities

The NMFS and USFWS BiOps list the following strategies for flow management:

- Limit the winter/spring drawdown of storage reservoirs to increase spring flows and the probability of reservoir refill.
- Maximize reservoir storage by filling all storage projects by June 30 in order to provide summer flow augmentation
- Draft from storage reservoirs in the summer to increase summer flows.
- Provide minimum flows in the fall and winter to support mainstem spawning and incubation flow below Bonneville Dam.

RESPONSE: The three strategies listed in the WMP reflect the strategies for flow management as written in the BiOp. The first strategy captures the concept in the recommended addition.

The Action Agencies have reviewed these strategies and other requirements in the BiOps and developed the following priorities (in order) for flow management and individual reservoir operations:

- Operate storage reservoirs (Hungry Horse, Libby, and Albeni Falls) to meet criteria for bull trout and sturgeon.
- Refill the storage projects by June 30 to provide summer flow augmentation.
- Operate storage projects to be at their April 10 flood control elevation to increase flows for spring flow management.
- Operate storage projects to the higher of the April 10 flood control elevation or VARQ elevation to improve reservoir refill probability and if possible ~~be at their April 10 flood control elevation~~ to increase flows for spring flow management.

RESPONSE: Text in the WMP has been changed to indicate achieving either April 10 Base –CRT63 flood control elevation or VARQ elevation (which ever is in effect) to clarify.

- Provide fall and winter minimum flows for chum spawning without impacting on spring operations for salmon and steelhead or the Vernita Bar agreement.

RESPONSE: The Action Agencies find that by having this priority the last priority there is no need for the additional text.

The initial objective is to operate the storage reservoirs (Dworshak, Hungry Horse, Libby, Albeni Falls, and Grand Coulee) to be at flood control levels or VARQ by early April. This level varies by runoff forecast. Reaching early April flood control levels will be affected by how much water was released for flood control, power generation, and fishery flows to support both chum and

Hanford reach spawning. There may be years when chum and Hanford Reach flows may need to be reduced in order to be at the early April flood control levels.

RESPONSE: *Text in the WMP has been modified as recommended to clarify.*

The next objective is to refill the storage reservoirs by about June 30 to maximize available storage of water for the benefit of summer migrants. The June 30 refill would have priority over spring flow (April, May, June) objectives, although there would be an attempt to meet the spring flow objectives and other fish needs. The goal of spring operations is to avoid uncontrolled spills. Instituting a sliding scale for the refill date based on reservoir inflow forecasts can mitigate concerns regarding increased potential for a forced spill at Hungry Horse and Libby Dams. In low water years, the reservoir refill target should be earlier than in high water years. The intent is to create a parabolic refill trajectory, such that as the reservoir approaches full pool, the rate of refill slows. This allows operational flexibility to respond to inflow volumes and smooth the discharge prior to and after refill. The goal is to fill the reservoir as soon as inflows decline to turbine capacity so that discharge after refill approximates the discharge prior to refill. This reduces the potential for a forced spill and associated gas supersaturation problems downstream. Smoothing the discharge is beneficial to river biota because the width of the unproductive varial zone is reduced.

RESPONSE: *This is more detail than the Action Agencies find necessary here. These are all good secondary goals that may be considered during in season management.*

The final objective is the management of available storage to augment summer (July and August) flows to achieve flow objectives and for water temperature control. The storage reservoirs will be drafted to their specified August 31 draft limits to augment summer flows. These limits would have a higher priority over the summer flow targets in order to meet other project uses and reserve water in storage for 2003. The objective of summer operations is to achieve stable flows during the summer months of July and August. Stable summer flows protect biological production in the rivers downstream of storage reservoirs during the productive summer months. Stable river flows benefit all fish species of special concern in Montana and these flows continue downstream to aid anadromous salmon smolt migration in the lower Columbia River. To avoid unnecessary impacts in Montana, Montana reservoirs will be operated conservatively, releasing stored water gradually over the summer to avoid unnatural flow fluctuations. Stable flow releases are consistent with the summer bull trout flows called for by the USFWS BiOp and beneficial to resident fish.

RESPONSE: *This is more detail than the Action Agencies find necessary here. These are all good secondary goals that may be considered during in season management.*

These objectives are intended as general guidelines in overall system operations. The BiOps also embrace the concept of adaptive management. Adaptive management is the concept that the operation of the system should account for current information on stock status, biological effectiveness requirements, and hydrologic and environmental conditions as opposed to following a rigid set of rules. System managers recognize that there is often insufficient water to meet all the actions specified in the BiOps and meet other system obligations such as flood protection, power system reliability, irrigation, recreation, and navigation needs. The use of water for any one fish species or project purpose will most likely affect the amount of water available for other fish species or project purposes. Therefore, the Action Agencies, in coordination with regional parties through the TMT, endeavor to balance the multiple purposes of the system, and keep the provision of measures to benefit listed species a high priority. In the future, the Action Agencies will develop mathematical formulas that relate dam operation to project-specific inflow forecasts. These relationships will be used to direct operations including VARQ, tiered sturgeon flows from Libby Dam, stable summer flows for bull trout and specific plans for drought conditions. In the Flathead, drought formulas should be consistent with the Flathead Lake Drought Management Plan.

RESPONSE: *“Biological effectiveness” has been added to the list of information in adaptive management considerations.*

The Corps is working with the USFWS to further refine the Libby operation. The Action Agencies are reevaluating the sturgeon flow tiers to make accounting for the water more straightforward, and will work with the USFWS, MDFWP, and other interested parties to do so.

There needs to be a section on spill priorities. Which projects and how much spill at what times?

RESPONSE: *More detail on spill operations is included in the Spring/Summer Update.*

2.2 Conflicts

2.2.1 Flood control draft versus project refill

VARQ should be implemented this year before the Army Corps’ DEIS is complete because the impacts are minimal and easily mitigated. The USFWS and NMFS 2000 Biological Opinions on the operation of the Federal Columbia River Power System called for VARQ at Hungry Horse Dam by water year 2001 and Libby dam by water year 2002. VARQ allows dam operators to store more water prior to runoff during less than average water years (years with low flood potential) so that river flows can be augmented during spring without compromising reservoir refill probability. This limits the duration and frequency of deep reservoir drawdowns, improves reservoir refill probability and produces a more naturally shaped dam discharge hydrograph. Careful implementation of VARQ at Hungry Horse and Libby Dams will improve spring flows for Kootenai white sturgeon and anadromous stocks in the lower Columbia, while

simultaneously improving reservoir and river conditions for westslope cutthroat trout and the threatened bull trout.

Model analyses have shown that VARQ affects existing operations only in average to below water years, when the threat of flooding is minimal, and that changes in flood control afforded by this strategy are negligible. The VARQ system flood control operation was designed to limit Libby Dam discharges to within the flood stage requirement at Bonners Ferry, the nearest downstream flood control center. Reported affects on the operation of Grand Coulee downstream are within the current operating constraints and therefore do not constitute a significant change. Immediate actions to implement VARQ are necessary because the RPAs specified in the BiOp constitute an emergency action to prevent the further decline of endangered species. Since these actions are clearly within the authorities of the Army Corps of Engineers, the Corps will use its authority to implement VARQ while the long-term EIS proceeds. Also, because failure to implement VARQ constitutes damage to listed Montana fishes, a delay in its implementation may not fall within discretionary guidelines typical of NEPA decisions

RESPONSE: *In regard to VARQ at Libby:*

The Corps is working toward implementing VARQ at Libby. The Corps has decided it will conduct an EIS before it can implement VARQ at Libby for the long term.

At the current time the Corps will:

- 1. Conduct studies, coordination and NEPA documentation and prepare a "Phase I" (Decision Document) report by December 2002, which will address whether an interim VARQ operation can be implemented in 2003.***
- 2. Look for opportunities to accelerate the EIS schedule.***
- 3. Consider any alternative actions that could potentially be implemented in lieu of VARQ in 2002.***

2.2.2 The provision of spring flows versus project refill and summer flow augmentation

Again, because water supply and runoff forecasts are not 100 percent accurate, it is hard to estimate how much water is available for spring flows and still assure refill at the storage projects by June 30. If too much water is allowed to flow through the storage reservoirs instead of being used to refill, there is an increased risk of not refilling the projects. This will reduce the water supply available for summer flow augmentation. On the other hand refilling the reservoirs too quickly in the spring results in early refill and less control of the amount and timing of the spring flows. This could also increase the risk of damage from flooding and potentially produce higher dissolved gas levels. The Action Agencies will strive to develop more definitive quantitative relationships to implement a sliding scale for the reservoir refill date.

RESPONSE: *The Corps is working with the USFWS to further refine the Libby operation. The Action Agencies are reevaluating the sturgeon flow tiers to make accounting for the water more straightforward, and will work with the USFWS,*

MDFWP, and other interested parties to do so. Exact operation of Libby is subject to in season management in TMT.

2.2.3 Chum flows versus refill/Spring flows

Setting the flow level for chum spawning and incubation in recognition of the spring refill priority is one of the decisions that the Action agencies in consultation with TMT have to make with the least amount of reliable information. Decisions about the flow level for chum spawning and incubation are made in the October/November time period, long before the Action Agencies have reliable information on the coming year's expected water supply. If the flow level selected is too high there is a risk of refill failure. Choosing to refill runs the risk of reducing the flow level and dewatering chum redds. A chum salvage plan is now being prepared to ensure some level of chum salmon production occurs in the event chum flows cannot be provided. Is this being developed? If so we would like to review it!

RESPONSE: The concept of the "salvage operation" was to expand the broodstock collection aspect of the Duncan Creek restoration project. The Duncan Creek project included the collection of adults from the main-stem Columbia River and then rearing the progeny of these adults in the Washougal hatchery. These juvenile fish would then be released into Duncan Creek to initiate a run of chum to this newly restored habitat. The "salvage operation" consisted of expanding the number of adults captured and reared in the Washougal hatchery beyond that needed to initiate a run in Duncan Creek. The number of adults comprising the salvage operation was to be proportional to the anticipated lack of spawning habitat in the mainstem Columbia or tributary creeks. Since access to spawning habitat was relatively good in 2001, the adult collection program was limited to those adults needed to initiate the Duncan Creek run.

2.2.4 Sturgeon pulse versus summer flow augmentation

Water released from Libby Dam for the spring sturgeon pulse during May through June may reduce the water available for summer flow augmentation from Libby. If the pulsed water cannot be stored in Grand Coulee, it will increase spring flows at the expense of summer flows. The Action Agencies are requesting further review of the sturgeon tiered flows. The USFWS Biological Opinion (USFWS 2000) specifies a tiered strategy for flow augmentation from Libby Dam to simulate a natural spring freshet. The specified discharge volume is determined by forecasted water availability, so that higher flows are released when water availability is ample and no flow augmentation occurs during drought. This tiered approach is an experimental design enabling researchers to examine thresholds in reproductive success and failure, and assess the needs of other sensitive species in the river and reservoir. Unfortunately, the tiered flows published in the USFWS BiOp were changed from the original Recovery Team recommendations. The inflow trigger points defining the release volume were reduced and the release volumes were increased. The measurement location was shifted from Bonners Ferry to Libby Dam. These changes were made without adequate modeling analyses to assure that the releases would be balanced with the objective of refilling Libby reservoir.

RESPONSE: The Action Agencies are reevaluating the sturgeon flow tiers to make accounting for the water more straightforward, and will work with the USFWS, MDFWP, and other interested parties to do so.

3.0 Decision Points and Water Supply Forecasts

	Early October	Winter (December - March)	Early April	Early May	June	Early July
<i>Operations</i>	<ul style="list-style-type: none"> Determine Integrate Rule Curves at Hungry Horse <u>and Libby</u> <p>RESPONSE: Text in WMP has been modified.</p>	<ul style="list-style-type: none"> <u>Determine flood control elevations to implement VARQ.</u> <p>RESPONSE: This is covered in the bullet “Determine flood control and refill strategies ...”</p> <ul style="list-style-type: none"> Begin spring transport discussions <u>how does this agree with two bullets above? There should be a section on criteria for transport decisions.</u> <p>—RESPONSE: The two bullets above do not directly relate to this. Detail on transport operations is contained in the Fish Passage Plan.</p>	<ul style="list-style-type: none"> Determine spring flow management strategy <u>including that achieves a high probability of priority for</u> refill <p>RESPONSE: This is addressed in strategy section.</p> <ul style="list-style-type: none"> Determine start dates and levels by project for spring spill <u>[should have specific criteria for these operations]</u> <p>—RESPONSE: These are spelled out in the BiOp as specified below.</p>	<ul style="list-style-type: none"> <u>Use May forecast to calculate the appropriate volume of the sturgeon tiered flow release from Libby using the original formula.</u> <p>RESPONSE: Part of text inserted.</p>		

4.0 Sub-Strategies: Reservoir Operations and System Flow Management to Enhance Fish Survival

The following table summarizes the major fish-related reservoir and flow operations by project. More detailed descriptions of each of these operations follow:

Project	Flood Control & Refill	Sturgeon	Bull Trout	Spring Anadromous	Summer Anadromous	Chum	Kokanee
Libby	<p>Winter: Operate to <u>VARQ</u> flood control rule curve <u>and achieve appropriate elevation</u> by April 10</p> <p><u>RESPONSE:</u> <i>Some of text inserted in WMP. Flood control rule curve covers both Base – CRT63 flood control and VARQ (which ever is in effect)</i></p>						
Grand Coulee	<p>Spring: <u>Refill by June 30 and</u> operate to meet flow objectives and June 30 refill</p> <p><u>RESPONSE:</u> <i>Text modified in WMP as recommended.</i></p>						

Project	Flood Control & Refill	Sturgeon	Bull Trout	Spring Anadromous	Summer Anadromous	Chum	Kokanee
Dworshak	<p>Spring: <u>Refill by June 30 and</u> operate to meet flow objectives and refill by June 30</p> <p><u>RESPONSE:</u> <i>Text modified in WMP as recommended.</i></p>						

4.1 Flow Objectives

The purpose of the flow objectives is to aid in achieving the hydrosystem performance standards by providing better instream flow to aid in juvenile migration and by enhancing water quality. However, as recognized in the BiOp it is impossible to achieve the flow targets in most water years because there is insufficient water and reservoir storage. This Water Management Plans strives to achieve the best possible conditions recognizing the priorities established in this document and the need to balance the limited water and storage resources available in the region.

RESPONSE: *Text in WMP has been modified to reflect main points of this recommendation.*

4.3.1 Flood Control

Libby will be operated during the winter season to achieve VARQ and ~~in order~~ to achieve a high probability of water surface elevations within 0.5 foot of the VARQ flood control rule curve by April 10 and with a high probability to refill by June 30, ~~except as specifically provided by the TMT.~~³

During the spring, the Action Agencies shall operate Libby to contribute to meeting the flow objectives ~~and~~ but the highest priority is to achieve refill by approximately June 30.⁴

RESPONSE: *Text in the WMP has been clarified in regard to VARQ or Base CRT63. The priority of refill is addressed in the priorities section of the WMP.*

4.3.2 Sturgeon

The purpose of the actions below is to provide water for sturgeon spawning. However, the sturgeon tiered flows need to be modeled in a system's context and improved. Flows for sturgeon need to be designed to avoid impacting other sensitive species. To accomplish this flow augmentation must be balanced with reservoir refill and with anadromous recovery actions in the lower Columbia Basin. The tiered flow strategy in the USFWS Biological Opinion on the operation of the Federal Columbia River Power System differs from the original strategy and will likely decrease the probability of reservoir refill. Greater release volumes are currently designated corresponding with lower volumes of reservoir inflow (Table 1). As per the BiOp, the mathematical relation between inflow forecast and discharge volume was to be recalculated by October 1, 2001. This has not been accomplished to date.

RESPONSE: *The Corps is working with the USFWS to further refine the Libby operation. The Action Agencies are reevaluating the sturgeon flow tiers to make accounting for the water more straightforward, and will work with the USFWS, MDFWP, and other interested parties to do so. Exact operation of Libby is subject to in season management in TMT.*

7.1.3 Libby VARQ

The purpose of VARQ is to provide more water for spring flows without reducing flood control protection. The federal Action Agencies have agreed to implement the tiered flow approach for

sturgeon, salmon flow augmentation and stabilized summer flows for bull trout. Montana has promoted these operational changes to benefit white sturgeon and bull trout, but as part of a package including VARQ. Without VARQ, these actions pose a threat to Montana's natural resources and summer flow augmentation by impacting reservoir refill. The preferred operation was to implement VARQ at the same time as the sturgeon and bull trout flows, so that Libby refill would not be impacted. Implementing VARQ will increase the number of years in which water will be available for summer flow augmentation. This can be accomplished while simultaneously improving river flows and reservoir refill. By delaying the implementation of VARQ, Libby Reservoir refill will be compromised, rather than improved. As a consequence summer flow augmentation for anadromous species in the lower Columbia River will also be compromised. It is for these reasons that VARQ needs to be implemented while and environmental impact statement is prepared.

RESPONSE: In regard to VARQ at Libby:

The Corps is working toward implementing VARQ at Libby. The Corps has determined it will conduct an EIS before it can implement VARQ at Libby for the long term.

At the current time the Corps will:

- 1. Conduct studies, coordination and NEPA documentation and prepare a "Phase I" (Decision Document) report by December 2002, which will address whether an interim VARQ operation can be implemented in 2003.***
- 2. Look for opportunities to accelerate the EIS schedule.***
- 3. Consider any alternative actions that could potentially be implemented in lieu of VARQ in 2002.***

7.1.6 Increased Flow Capacity at Libby

Language in the USFWS BiOp pertaining to incremental increases in the maximum discharge from Libby Dam is of particular concern to the State of Montana. Increased discharge from Libby Dam is a significant federal action, separate and distinct from VARQ, that has not been addressed under NEPA. Specifically, the USFWS BiOp calls for two incremental increases of 5 kcfs in the maximum discharge from Libby Dam. This action, if implemented, would increase the maximum dam discharge to over 35 kcfs within the near future. Flows of this magnitude would require that additional turbines be installed in Libby Dam or the use of the spillway. Neither option is acceptable. The State of Montana does not agree that white sturgeon data support increasing the magnitude of the peak. Instead, research indicates that a protracted runoff even with a gradual ramp down to stable summer flows would be more beneficial to sturgeon and bull trout. Secondly, Montana water quality standards restrict gas saturation to 110 percent saturation to protect aquatic resources in the rivers downstream of the federal dams. Use of the spillways has been shown to exceed that standard. Thirdly, Montana does not endorse the addition of turbine to Libby Dam. Increased discharge capacity and regulated flow fluctuations would increase the width of the biologically unproductive varial zone. For these reasons, it is not anticipated that flows will be managed to exceed the current hydraulic capacity of the turbines at Libby dam.

RESPONSE: *Comment noted. The Action Agencies are committed to implement the BiOps.*