





## **2015-2017 Grant Solicitation**

# **WATER CONSERVATION, REUSE AND STORAGE FEASIBILITY STUDY GRANT PROGRAM**

### ***GRANT APPLICATION***

#### **APPLICATION INSTRUCTIONS**

1. Complete Sections I through VII in the spaces provided.
2. An application must be submitted on a form provided by the Department. An explanation must accompany the application if any of the information required cannot be provided [OAR 690-600-0020(6)].
3. If in hard copy - use 8 ½" x 11" single sided, unstapled pages. Provide any attachments to application also on 8 ½" x 11" single-sided, unstapled pages. Avoid color and detail that will not photocopy clearly.
4. Please Contact the Department's Grant Specialist Jon Unger at **503.986.0869** or [Jon.J.Unger@wrд.state.or.us](mailto:Jon.J.Unger@wrд.state.or.us) if you have any questions.

**Application Deadline: July 31, 2015 5:00 PM,**

(Application must be received by this date and time)

Mail application to:

**OREGON WATER RESOURCES DEPARTMENT  
Attention: Grant Specialist  
725 Summer Street NE, Suite A  
Salem, OR 97301**

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## KEY GRANT INFORMATION

**Introduction.** The Water Conservation, Reuse and Storage Grant Program, established by Senate Bill 1069 (2008), is designed to fund the qualifying costs of feasibility studies that evaluate the feasibility of developing water conservation, reuse or storage projects. Oregon is facing increasing water demand and increasingly scarce water supplies. To adequately meet Oregon's diverse water demands now and into the future, Oregonians must use their water wisely and efficiently. That means looking more closely at innovative water conservation and reuse programs and environmentally sound storage projects that capture available water so it can be put to good use when needed.

**What is a feasibility study?** A feasibility study is an assessment of a proposed plan or method. Typically there should be a previously identified water project that appears to have merit but is lacking important details necessary to determine whether or not to proceed. The feasibility study focuses on helping answer the essential question of "should we proceed with the proposed project idea?" All activities of the study are directed toward helping answer this question. Ideally the project identified will have community support and will have been identified through a collaborative process.

**Match Funding.** To be eligible for funding applicants must clearly demonstrate funding from a source other than the Program of not less than a dollar-for-dollar match from cash or in-kind services. For example, if \$25,000 is requested in Program Funds, then there must be a match of at least \$25,000 from another source. The matching funds must be secured or in the process of being secured. The maximum grant award is \$500,000.

**Eligibility Requirements for Storage Studies.** To be eligible for funding for a project feasibility study associated with a proposed storage project that would: Impound surface water on a perennial stream; Divert water from a stream that supports sensitive, threatened or endangered fish; **or** Divert more than 500 acre-feet of surface water annually, the proposed project feasibility study must contain the following elements:

- Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows;
- Comparative analyses of alternative means of supplying water, including but not limited to the costs and benefits of water conservation and efficiency alternatives and the extent to which long-term water supply needs may be met using those alternatives;
- Analyses of environmental harm or impacts from the proposed storage project;
- Evaluation of the need for and feasibility of using stored water to augment in-stream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values; and
- For a proposed storage project that is for municipal use, analysis of local and regional water demand and the proposed storage project's relationship to existing and planned water supply projects.

See *Application Criteria and Evaluation Guidance* for assistance in filling out this application.

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## IV. Grant Specifics

### Section A. Common Criteria

**Instructions:** Please answer all questions contained in this section. It is anticipated that completed applications will result in additional pages.

1. Describe your goal and how this study helps to achieve the goal.

*The long-term goals for MFID and its partners are to: 1) Maintain the ability to consistently provide irrigation water and generate hydropower into the future; 2) Improve downstream flows and stream temperatures for anadromous fish; and 3) Maintain rearing habitat for bull trout within Laurance Lake reservoir. MFID is considering an increase in storage capacity in Laurance Lake Reservoir and changes to reservoir management in order to meet these goals.*

*Two primary factors are prompting MFID to evaluate reservoir management and storage changes in pursuit of the above goals. The first factor is climate change. Results from the recent Hood River Basin Study (Bureau of Reclamation, 2014) predict decreased summer streamflows in the Hood River Basin, including the Middle Fork Hood River sub-basin. Snowpack and water availability during this year's drought will become the average condition by the year 2030, according to climate change models completed for the Basin Study. The second factor is MFID's upcoming renewal of their special use permit with the U.S. Forest Service. (The reservoir is located on Forest Service land.) As part of the renewal process, MFID may need to increase stream flows downstream of Laurance Lake Reservoir during the summer in order to improve stream temperature and habitat conditions for threatened winter steelhead and spring Chinook. At the same time, higher summertime reservoir levels are beneficial to a population of bull trout that rears in the reservoir and spawns in upper Clear Branch.*

*This study will investigate the feasibility of increasing storage in the reservoir by approximately 250 acre-feet, which could potentially be accomplished by raising the spillway crest by two feet in the spring to capture more of the spring runoff. As part of the Hood River Basin Study, a preliminary evaluation of installing an Obermeyer weir on the 80' dam spillway indicated this as a low-cost alternative for increasing storage. The study will also evaluate effects on instream water temperature and habitat that may result from increasing storage and changing reservoir management.*

*This study will help meet our goals by identifying the feasibility and environmental effects of increasing storage and improving reservoir management to balance the needs for irrigation, water quality, and instream habitat. If the storage increase proves feasible, it will increase the flexibility MFID has to balance the multiple demands on future stream flow.*

2. Describe the water supply need(s) that the proposed project addresses. Identify any critical local, regional, or statewide water supply needs that implementation of the project associated with the feasibility study will address. **Responses should rely upon solid water availability and needs data/analysis.** For examples of water supply needs see "Criteria and Evaluation Guidance Document."

*The proposed project will address water supply needs for agriculture, the local economy, and the environment. Middle Fork Irrigation District serves a total of 6,430 acres on the north side of Mt. Hood. About 85% of these acres are in fruit production, primarily pears. The economy of Hood River County, which shares the watershed's boundary, is primarily dependent upon irrigated agriculture. In 2012, raw agricultural commodity sales in Hood River County totaled \$112 million. Furthermore, about one-third of the U.S. winter pear crop is grown in the Hood River Valley (OSU Extension).*

*Another equally important water supply need is for ESA-listed (threatened) salmonids in the Basin. In the Middle Fork Hood River sub-basin, these species include winter steelhead, spring Chinook, and bull trout. It should be noted that spring Chinook are an economically and culturally important species for the Confederated Tribes of the Warm Spings (CTWS) and that the Hood River Basin is part of the Tribes' ceded lands.*

*Over the past several years, MFID has collaborated with all relevant partners in an effort to identify projects and management changes to ensure water resource reliability for district patrons and listed fish species. This group of partners, referred to as the Adaptive Management Committee, includes CTWS, USFS, USFWS, NMFS, ODFW, DEQ, and the Hood River Watershed Group and SWCD. One recommendation by the group is to increase summer streamflow in Clear Branch, below the reservoir (exact percentage of inflow or amount TBD). However, increasing reservoir release will either have an impact on irrigation water availability, hydropower production, or reservoir levels unless a combination of increased storage and other management changes can make up for it.*

*The Hood River Basin Water Conservation Assessment (Watershed Professionals Network, 2013 ) evaluated all potential water conservation opportunities for potable and irrigation water suppliers in the Hood River Basin. This report concluded that the district itself has very little potential to implement additional water conservation measures. MFID's distribution system is almost entirely piped and the only remaining canal is not cost-effective to pipe. However, district irrigators have the potential to save as much as 10 cfs if all remaining acreage (estimated at 4300 acres) was converted to high efficiency irrigation equipment and managed using soil moisture and weather data. MFID is actively encouraging and providing cost share to patrons willing to upgrade their equipment and management.*

3. Explain how the proposed project will meet the water supply need(s), and indicate what percentage of that need will be met. (For example: If your water supply need is 20,000 acre-feet of additional water and the project will supply 10,000 additional acre-feet, 50 percent of your need will be met).

*MFID's need for the additional storage volume varies from year to year depending mostly on the preceeding year's snowpack. This year MFID purchased back 108 acres of irrigation water for a savings of approximately 270 ac-ft. The water use from the acreage taken out of production is similar to the proposed reservoir expansion (i.e., 250 ac-ft). Currently, in an average year MFID does not need to buy back irrigation rights. Although this year's snowpack was extremely low, the Hood River Basin Study climate models predict that this will become the new normal. Thus, almost 100% of the future need for irrigation water (in an average year) could be met with an additional 250 ac-ft. of storage.*

*In the future, there will be a need to provide both irrigation water and instream/in-reservoir habitat for fish. If additional water is passed downstream during the summer to benefit salmonids in lower Clear Branch, additional water will need to be available. One promising approach is to continue improving on-farm efficiency. In the meantime, increased storage will likely support more water downstream in an average year.*

4. Describe the technical aspects of the feasibility study and why your approach is appropriate for accomplishing the specific study goals and objectives.

*The technical aspects of this study include: 1) an evaluation of instream flow and salmonid spawning and rearing habitat under proposed storage/management changes, 2) evaluation of water conservation opportunities, 3) an evaluation of water supply, demand, and rights, 4) a temperature model predicting water temperatures in reservoir and downstream under different storage and management scenarios, and 5) an assessment of the safety and technical and economic feasibility of seasonally raising the spillway crest height. These technical evaluations will build on existing studies where possible, and identify any potential constraints that could make the reservoir expansion infeasible. Each individual aspect will be evaluated as follows:*

1. *The instream and peak flow requirements will be evaluated by building off an existing Middle Fork Instream Flow Incremental Methodology (IFIM) study and consulting with ODFW, USFWS, and CTWS. This instream and peak flow evaluation includes evaluating the ability to pass more inflow downstream (as opposed to storing it) to augment streamflows in lower Clear Branch during the summer. Basing the instream and peak flow evaluation off of IFIM results will provide an in-depth, detailed scientific habitat evaluation, which will be supported by fisheries management agencies and CTWS.*

2. *Alternative means of supplying water, including quantification of water conservation opportunities that would reduce irrigation water demand, will be evaluated by analyzing potential reductions in conveyance and on-farm water use. This analysis will build off the Hood River Basin Water Conservation Assessment (WPN, 2013) which performed a general evaluation of water conservation measures for the entire Hood River Basin, but was not detailed enough to evaluate all opportunities in MFID. This approach is appropriate because it*

will be a comprehensive assessment of water conservation and alternative means of supplying water, but will be able to be performed cost-effectively since it builds off an existing study.

3. Water supply, water demand, and water rights will be assessed by a certified water rights examiner that has years of experience working with MFID's system. Water supply will be assessed by evaluating historic (1968-present) inflows combined with future predictions from the Hood River Basin Study. This approach maximizes the use observed data and combines it with recent climate predictions, allowing the most accurate prediction of future inflows to the reservoir. Water demand will be evaluated by combining historical observations with projected crop and area specific evapotranspiration projections available from USBR AgriMet. These approaches are appropriate because they are the best available science, yet can be completed in a cost-effective manner since they build off of existing data and studies.

4. The in-reservoir and downstream temperature impacts will be evaluated using CE-QUAL-W2 for the reservoir and HeatSource for the river segments. (Note: this component is being paid for by OWEB grant 215-4002-11259.) The CE-QUAL-W2 model was originally developed by Portland State University as part of an earlier study to evaluate in-reservoir and release temperature as a function of reservoir elevation. For this study it will be modified to evaluate the temperature impacts of increasing storage volume in the reservoir. We will calibrate the HeatSource models with current stream flow and temperature measurements on tributaries. This approach uses the best available science, yet builds off existing models and therefore can be performed in a cost-effective manner.

5. Dam safety and technical/economic feasibility of raising the height of the spillway crest will be evaluated by Klienschmidt, who have been MFID's dam safety engineers for the past 7 years. This evaluation will include both potential changes to the probable maximum flood, and any impacts to the spillway that implementation of the project would have. This analysis is appropriate because it will evaluate all safety and technical feasibility parameters that may be required by FERC or other licensing agencies.

5. Describe how the feasibility study will be performed. Include:

- a. General summary statement that describes the study progression.
- b. When the feasibility study will begin.
- c. Listing of key tasks to be accomplished with each task having:
  - i. Title
  - ii. Timeline for completion
  - iii. Description of the activities to be performed in this key task
  - iv. Description of the resources necessary for accomplishing the key task

**Example:**

- (i) Streamflow measurement;
- (ii) September-April;
- (iii) Weekly streamflow measurements will be performed to gather hydrographic data for the hydrologic analysis to take place in May;
- (iv) A technician will be hired to perform the streamflow measurements.

(Key tasks listed here are to be placed in Section VI. Project Feasibility Study Schedule for a quick reference “graphical” representation of the schedule.)

*a. Study Progression: The study will begin with the temperature modeling and analyses related to instream flows. This will be followed by the water conservation and water supply/demands/rights analyses. All of these tasks will be completed by Watershed Professionals Network (WPN). Beginning in October, Kleinschmidt will conduct the dam safety review, permitting and licensing screening, and*

conceptual design and cost estimates. A final report and recommendations will be completed by December 2016.

b. The study will begin as soon as OWRD funding is secured. The temperature model (Task 4) funded by OWEB is in progress and will be completed by December 2015.

*Task 1-Instream Flow Assessment (November 2015-March 2016):*

A. Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows.

o The IFIM has established flow-habitat relations in all critical stream segments that are affected by the proposed project.

o The flow strategy spreadsheet tool will be used to incorporate the IFIM results into a management tool that allows for assessing the habitat implications of future management strategies, including additional reservoir storage,

o The gravel augmentation monitoring study, in progress, will be used to establish links between gravel transport and retention and peak/flushing stream discharge

o The water temperature modeling will provide an avenue for assessing the water temperature implications of any of the proposed flow/reservoir management scenarios

B. Analyses of environmental harm or impacts from the proposed storage project:

o As described under "Task 1.A.", the tools recently developed or in development by the MFID and AMC (i.e., IFIM study, future flow strategy assessment tool, stream temperature models, gravel augmentation monitoring) provide a suite of ready-made analysis tools to analyze the impacts and benefits of the proposed action

C. Evaluation of the need for and feasibility of using stored water to augment in-stream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values

o The primary purposes of the studies, tools, and infrastructural changes developed, implemented, and proposed by the MFID and AMC is to evaluate how to better-use the water sources available to MFID to increase the benefits to aquatic resources while maintaining MFID's ability to provide water to its patrons.

*Task 2 - Water Conservation Analysis (January - June 2016)*

The comparative water conservation analysis will use MFID-specific results from the Hood River Basin Water Conservation Assessment (Watershed Professionals Network, 2013) and Middle Fork Irrigation District Water Management and Conservation Plan (Middle Fork Irrigation District, 2012). This includes an analysis of sprinkler types (e.g., impact, micro), acreage using each sprinkler type, acreage by crop type, and potential savings by converting acreage to micro sprinkler. The analysis will also include an evaluation of seepage in the remaining MFID open canal. This approach will allow a cost-benefit analysis (\$/cfs and \$/ac-ft) between project types, as well as help refine actual required additional reservoir storage volume.

*Task 3 - Water Supply, Water Demand, and Water Rights Calculation (January - June 2016)*

The water supply and demand calculation will build-off of the existing Hood River Basin Study (Reclamation, 2013) results. The Basin study was spatially coarse and used average monthly demands. This feasibility analysis will use exact demand nodes for each diversion point and will use a daily timestep. This daily timestep will provide a more accurate assessment of true storage needs. These calculations will also include potential water conservation projects quantified in Task 2, as well as impacts to streamflow from climate change. This approach will reflect the true nature of existing water supply and demand in MFID and include an analysis of how those will change in the future.

*Task 4-Water Temperature Modeling (April - December 2015)*

Temperature effects of proposed storage and flow management changes will be evaluated using a CE-QUAL-W2 temperature model of the reservoir. In addition, HeatSource will be used to develop three

*separate river temperature models to evaluate the effect of the proposed flow and reservoir management strategies. The geographical scope of the proposed analysis is Laurance Lake (including evaluation of inflow volume and temperature from Upper Clear Branch and Pinnacle Creek) downstream to the confluence of the Middle Fork Hood River with the East Fork. The analysis will include temperature modeling of Laurance Lake outflow, Clear Branch/Middle Fork Hood River below the lake, and Coe and Eliot Branches from the diversions downstream to their mouths. The temporal scope will be a time period sufficiently long to capture year-to-year variability in summertime water temperatures. We will calibrate the model with stream flow and temperature measurements (continuous April - November) at 16 sites (see attached map.)*

*Task 5 - Dam Safety Review (October 2015 - March 2016)*

*Increasing the storage volume in the dam will increase hydrostatic loading on the spillway during normal and flood conditions, which has the potential of adversely affecting the dam. This task will perform a hydraulic analysis to determine the effects on the dam for the probable maximum flood (PMF). Also, the hydraulic analysis will include an assessment of potential effects of spillway modifications that may be necessary for installation of the flashboard system, for example the addition of concrete piers to support the flashboard system may reduce the discharge capacity of the spillway. In addition, we would investigate other crest raising systems for the drop inlet, for example, a standard flashboard system. The intent of evaluating the alternative is to consider gaining the same water storage without the spillway constrictions associated with the inflatable flashboard system.*

*Stability analysis will be performed on the spillway inlet structure to calculate stability safety factors. The safety factors will be compared to recommended safety factors for high hazard dams, as required by FERC in the Engineering Guidelines for the Evaluation of Hydropower Projects, Chapter VI. Slope stability of the embankment dam will be reviewed based on the increased pond levels for both the increased storage state as well an increase in the PMF flood level if previous analysis determines there is in fact an increase. Results of these analyses will be compared to existing data to determine the effects on the dam.*

*Task 6 - Permitting and Licensing Screening (October 2015 - September 2016)*

*A screening-level review of potential environmental issues, permit requirements, and required FERC license-exemption process efforts will be conducted. It is expected that the recent NRCS assessment of the dam (Kleinschmidt, 2015) will be a useful resource for this review, as well as other environmental studies recently conducted by the District.*

*Task 7 - Conceptual Design and Cost Estimate (July - December 2016)*

*Conceptual plans and cross-sections will be developed to assess what the basic needs are for the System and determine if the requirements can be met. Namely, where can a control building be installed on or near the dam to house the inflation system, how will power and communications be provided to the blower house, what modifications to the dam will be required to install the System on the drop inlet, and can the System be designed and installed to comply with operational needs? This task will require a site visit to take measurements, photographs and observations specific to the scope of this project.*

*A preliminary cost opinion will be developed in association with the conceptual design. The details of the design will be based on vendor quotes and past experience with the installation of similar systems.*

*Task 8 - Final Report and Recommendations*

*A final report containing analysis and results for Tasks 1-7 will be completed. The intent of the report is to document impacts to aquatic species, potential water conservation measures that can be implemented, potential permitting or regulatory issues, and any specific design issues that may impact the feasibility of installation of the System before moving into the design phase. Based on the findings in Tasks 1-7, the report will make a recommendation if MFID should move forward with construction of th System.*

6. Please provide the following data and information for the proposed project and the project's sources of water supply:

- a. The location of the proposed project. Include the basin, county, township, range and section. Attach a **map** that identifies the project's implementation area to this application.

*Hood River Basin, Hood River County, T1N R9E sect. 24, 25/ T1N R10E sect 18,30,31/ T1S R9E sect. 2, 11, 12, 14-16, 21-23, 26-29, 31-35/ T2S R9E sect. 3,4,9,10. See attached map for location of reservoir and extent of temperature modeling.*

- b. The name(s) and river mile(s) of the source water and what they are tributary to, if applicable.

*Clear Branch (RM 0.5) and Pinnacle Creek (RM 0) flow into Laurance Lake. The reservoir discharges into Clear Branch, which is a tributary of the Middle Fork Hood River.*

- c. Whether the project will be off-channel or on-channel (for above-ground storage only).

*The project will augment existing on-channel storage.*

- d. Water availability to meet project storage. For above-ground storage the Department typically evaluates availability using a 50 percent exceedance water availability analysis.

*Water availability for this potential storage project was confirmed using OWRD's Water Use Availability tool at the 50% flow exceedance level. The analysis showed that water is available for the months November through June for the project site and all locations downstream (includes East Fork at the mouth and two main stem Hood River locations). The period that water is available (November through May) matches when the project would use water to fill the additional storage volume.*

- e. Proposed purposes and/or uses of conserved or stored water.

*The stored water will be used for irrigation, in-reservoir habitat, and for downstream release for in-stream habitat. Water released for irrigation also typically travels through one or two of MFID's three hydro plants before it gets turned into an orchard for consumptive use.*

- f. Environmental flow needs and water quality requirements of supply source water bodies.

*In-reservoir habitat: The reservoir is habitat for ESA-listed Bull Trout, and the ability to store a portion of the spring flood will increase both the amount and quality of the habitat. The amount of habitat will increase simply by starting the irrigation season with ~250 ac-ft more of storage, while the quality of habitat increases through the additional storage volume being able to reduce reservoir temperatures.*

*Instream flows in Clear Branch below the dam primarily affect winter steelhead and spring Chinook. Bull trout may also reside in this section.*

*The water temperature standard for bull trout is 10 degrees C; water temperature is most limiting for this species.*

7. What local, state or federal project permitting requirements/issues/approvals do you anticipate in order for the feasibility study to be conducted? If approvals are required, indicate whether you have obtained them. If you have not obtained the necessary permits/governmental approval, describe the steps you have taken to obtain them. If no permits are needed, please provide explanation.

*MFID has obtained all necessary approvals for conducting this feasibility study.*

8. Describe the level of involvement, interest and/or commitment of local entities associated with the feasibility study. Describe how the feasibility study and/or proposed project will benefit/impact these entities. Attach letters of support if available.

*This feasibility study is broadly supported by Basin partners. Please see attached letters of support for more detail.*

9. Identify when matching funds will be secured, from whom, and the dates of matching funds availability.

*All matching funds and in-kind services for this project are secured. The OWEB grant became available in December 2014. All other match will be available immediately if the grant is awarded.*

10. Provide a description of the relevant professional qualifications and/or experience of the person(s) that will play key roles in performing the feasibility study. If the personnel have not been decided upon, include a description of the professional qualifications and/or experience of the person(s) you anticipate will play key roles in performing the feasibility study.

*This study will be performed by Kleinschmidt and WPN. Kleinschmidt will be performing tasks 4, 5, 6, and part of 7. Kleinschmidt has been MFID's dam safety engineering group for seven years, and has performed design and engineering for multiple systems similar to what is being evaluated in this study. WPN has also been working with MFID on ecological impacts and water conservation for over five years, and will be performing tasks 1, 2, 3, and part of 7. Both firms have licensed professional engineers that will be working on this project. Additionally, Kleinschmidt has a licensed geotechnical engineer that will be perform the dam safety analysis, while WPN will use their Certified Water Rights Examineer to perform the water rights analysis.*

## Section B. Unique Criteria

**Instructions:** Address the set of items below that applies to the type of feasibility study that this grant will fund.

### **Water Conservation** or **Reuse**

1. Water Conservation or Reuse projects that are identified by the Department in a statewide water assessment and inventory receive a preference in the scoring process. Contact the Department's Grant Specialist to include your project on the inventory.
2. Explain how the associated project will either: (a) mitigate the need to develop new water supplies and/or (b) use water more efficiently. Reference documentation and/or examples of the success of similar or comparable water conservation/reuse projects that would be available upon request.
3. Provide a description of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area. If permitting or other approvals are not needed please indicate and provide an explanation.

## **Above-Ground Storage**

Please answer the following three questions **BEFORE** proceeding:

- Will the project divert more than 500 acre-feet of surface water annually?  Yes  No
- Will the project impound surface water on a perennial stream?  Yes  No
- Will the project divert water from a stream that supports sensitive, threatened or endangered species?  Yes  No

*If you answered "Yes" to any of these questions, by signature on this application, you are committing to include the following required elements in your feasibility study.*

Describe how you intend to address the required elements in your feasibility study:

- a) Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows.

*Optimum, peak, and other components of instream flows will be evaluated under Task 1. This task will use existing Weighted Usable Area curves from the recent Middle Fork IFIM study (WPN, 2011); ODFW will be consulted on optimal timing and volume of instream flows. Specifically, this task will evaluate the impacts on cumulative weighted usable area of shifting some of the spring flood release into irrigation use and late summer instream releases. Additionally, since MFID's reservoir is habitat for ESA-listed Bull Trout, this study will also modify an existing temperature model to evaluate the in-reservoir habitat impacts.*

- b) Comparative analyses of alternative means of supplying water, including but not limited to the costs and benefits of water conservation and efficiency alternatives and the extent to which long-term water supply needs may be met using those alternatives.

*A comparative analysis of alternative means of supplying water (or reducing demand) will be done in Task 2. However, because water conservation has long been a priority of MFID, the district itself has a limited number of projects (and therefore potential water demand reductions) left. Nonetheless, all potential water conservation projects will be quantified. An Excel database will be created in Task 2 that will document all potential projects, amount of water savings achievable, costs, and the ability to meet other MFID goals. This database will be used facilitate a trade-off analysis of which projects should be implemented, as well as used in determining target storage volumes (i.e. conservation projects will reduce future demand).*

- c) Analyses of environmental harm or impacts from the proposed storage project.

*An analysis of environmental harm or impacts is conducted through the Task 1 instream flow assessment. This task will be performed in consultation with ODFW and focus on eliminating any environmental harm.*

- d) Evaluation of the need for and feasibility of using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values.

*Similar to A and C above, Task 1 will evaluate both the need for, and the ability of, using stored water to augment in-reservoir habitat and instream flow. This will be done in conjunction of a comparative analysis of water conservation opportunities, and in consultation with ODFW.*

Is the proposed storage project for municipal use?

- Yes  No

If "Yes," then please describe how you intend to address the following required element in your feasibility study:

- e) For a proposed storage project that is for municipal use, analysis of local and regional water demand and the proposed storage project's relationship to existing and planned water supply projects.

**Proceed in addressing the following items:**

1. Describe to what extent the project associated with the feasibility study includes provisions for using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life or other ecological values. Projects that include the above provisions receive preference in the scoring process.

*The project would augment downstream flows and increase in-reservoir habitat, both of which maintain and enhance aquatic life. The reservoir is habitat for endangered Bull Trout, and additional water stored would be additional habitat until it's release late in the irrigation season. As well as being additional habitat, the extra 250 ac-ft will also help keep the lake cooler, hence increasing the quality of the habitat. As far as downstream flow, the additional storage volume will make MFID more likely to be able to meet increased downstream flow targets, which inturn will enhance aquatic habitat.*

2. Provide a review of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area.

*A). MFID will need to amend it Special use permit from the Forest Service and will need FERC approval for the project. MFID has already been in consultation with the Forest Service, and would add this project to the existing special use permit. Clear Branch dam is regulated by FERC from a dam safety perspective and therefore MFID would need FERC approval but no permits are issued by FERC. Key elements needed for FERC approval will be generated as part of this feasibility study.*

*B). The dam itself is owned by MFID, while the additional 2' of land that would be seasonally inundated is managed by the Forest Service. The land managed by the Forest Service is already inundated to the same elevation in the springtime, so no additional inundation area would occur on Forest Service land. As with permitting requirements, MFID has consulted with the Forest Service on the proposed project..*

**Storage Other Than Above-Ground [Including Aquifer Storage and Recovery (ASR)]**

Please answer the following three questions **BEFORE** proceeding:

- Will the project divert more than 500 acre-feet of surface water annually?  Yes  No
- Will the project impound surface water on a perennial stream?  Yes  No
- Will the project divert water from a stream that supports sensitive, threatened or endangered species?  Yes  No

*If you answered "Yes" to any of these questions, by signature on this application, you are committing to include the following required elements in your feasibility study.*

Describe how you intend to address the required elements in your feasibility study:

- a) Analyses of by-pass, optimum peak, flushing and other ecological flows of the affected stream and the impact of the storage project on those flows.
- b) Comparative analyses of alternative means of supplying water, including but not limited to the costs and benefits of water conservation and efficiency alternatives and the extent to which long-term water supply needs may be met using those alternatives.
- c) Analyses of environmental harm or impacts from the proposed storage project.
- d) Evaluation of the need for and feasibility of using stored water to augment instream flows to conserve, maintain and enhance aquatic life, fish life and any other ecological values.

Is the proposed storage project for municipal use?

Yes     No

If “Yes,” then please describe how you intend to address the following required element in your feasibility study:

- e) For a proposed storage project that is for municipal use, analysis of local and regional water demand and the proposed storage project’s relationship to existing and planned water supply projects.

**Proceed in addressing the following items:**

1. Underground storage projects that are identified by the Department in a statewide water assessment and inventory receive a preference in the scoring process. Contact the Department’s Grant Specialist to include your project on the inventory.
  
2. Provide a review of: (a) Local, state and/or federal permitting requirements and issues posed by the **implementation** of the project associated with the feasibility study and (b) property ownership status within the project implementation area.

## V. Match Funding Information

Applicants must demonstrate a minimum dollar-for-dollar match based on the total funding request. The match may include a) secured funding commitment from other sources, b) pending funding commitment from other sources, and/or c) the value of in-kind labor, equipment rental, and materials essential to the feasibility study. For secured funding, you must attach a letter of support from the match funding source that specifically mentions the dollar amount shown in the “Amount/Dollar Value” column. For pending resources, documentation showing a request for the matching funds must accompany the application.

In the “type” column below matching funds may include:	In the “status” column below matching funds may have the following status:
<ul style="list-style-type: none"> <li>• <b>Cash</b> - Cash is direct expenditures made in support of the feasibility study by the applicant or partner*.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Secured</b> - Secured funding commitments from other sources.</li> </ul>
<ul style="list-style-type: none"> <li>• <b>In-Kind</b> - The value of in-kind labor, equipment rental and materials essential to the feasibility study provided by the applicant or partner.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Pending</b> - Pending commitments of funding from other sources. In such instances, Department funding will not be released prior to securing a commitment of the funds from other sources. Pending commitments of the funding must be secured within 12 months from the date of the award.</li> </ul>

\*”Partner” means a non-governmental or governmental person or entity that has committed funding, expertise, materials, labor, or other assistance to a proposed project planning study. OAR 690-600-0010.

Match Funding Source (if in-kind, briefly describe the nature of the contribution)	Type (✓ One)	Status (✓ One)	Amount/ Dollar Value	Date Match Funds Available (Month/Year)
<i>Oregon Watershed Enhancement Board</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$42,800	<i>December 14</i>
<i>Middle Fork Irrigation District</i>	<input checked="" type="checkbox"/> cash <input type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$17,600	<i>December 14</i>
<i>Middle Fork Irrigation District</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$19,122	<i>December 14</i>
<i>HR Soil &amp; Water Conservation District</i>	<input type="checkbox"/> cash <input checked="" type="checkbox"/> in-kind	<input checked="" type="checkbox"/> secured <input type="checkbox"/> pending	\$3,000	<i>July 15</i>
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		
	<input type="checkbox"/> cash <input type="checkbox"/> in-kind	<input type="checkbox"/> secured <input type="checkbox"/> pending		

## VI. Feasibility Study Schedule

**Estimated Study Duration: October 1, 2015 to December 31, 2016**

Place an “X” in the appropriate column to indicate when each Key Task of the project will take place.

Feasibility Study Key Tasks	2015				2016			2017 & Beyond
	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	1 <sup>st</sup> Qtr	2 <sup>nd</sup> Qtr	3 <sup>rd</sup> Qtr	4 <sup>th</sup> Qtr	
<i>Task 1 - Instream Flow Analysis</i>	X		X	X				
<i>Task 2 - Water Conservation Assessment</i>				X	X			
<i>Task 3 - Water Supply, Water Demand, and Water Rights</i>				X	X			
<i>Task 4- Water Temperature Modeling</i>	X	X	X					
<i>Task 5 - Dam Safety Review</i>			X	X				
<i>Task 6 - Permitting and Licensing Screening</i>			X	X		X		
<i>Task 7- Conceptual Design and Cost Estimate</i>					X	X		
<i>Task 8 - Final Report and Recommendations</i>						X	X	

- **Please Note:** Successful grantees must include all invoices and identify which key tasks are associated with each invoice when requesting financial reimbursement.



## APPLICATION CHECKLIST

**Instructions:** Use this checklist to ensure that your application is complete. An incomplete application will jeopardize your application's review. **This form does not need to be included in your application packet.**

### General

If submitting electronically, the preferred format is either a Microsoft word or Adobe pdf

- Only one application is included with the packet (other applications must be sent separately).

### Paper submissions only

- The application and attachments are on 8 ½" x 11" paper.
- The application and attachments are single-sided.
- The application and attachments are not stapled or bound.

### Section I – Grant Information

- All questions in this section have been answered.
- The Grant Dollars Requested and the Total Project Cost mirror the totals shown in Section VII.

### Section II – Applicant Information

- All contact information for the applicant(s) and fiscal officer is complete and current.
- The certification is signed by an authorized signer.

### Section III – Feasibility Study Summary

- A brief summary, of no more than 150 words, is complete.

### Section IV – Grant Specifics

- All questions in Section A have been answered.
- If the type of feasibility study is water conservation, reuse or storage other than above-ground, you have contacted the Department and requested project be added to the Oregon Water Resources Department's statewide water assessment and inventory.
- All applicable questions for the type of grant requested have been answered.

### Section V – Match Funding Information

- Applicant has identified that at least 50 percent match has been sought, secured or expended.
- Letters of support are included for "secured" match funding sources.
- Documentation is included for "expended" match funds.
- Documentation is included for "pending" match funds.

### Section VI – Feasibility Study Schedule

- Estimated project duration dates have been supplied.
- All Key Tasks of the project are listed.

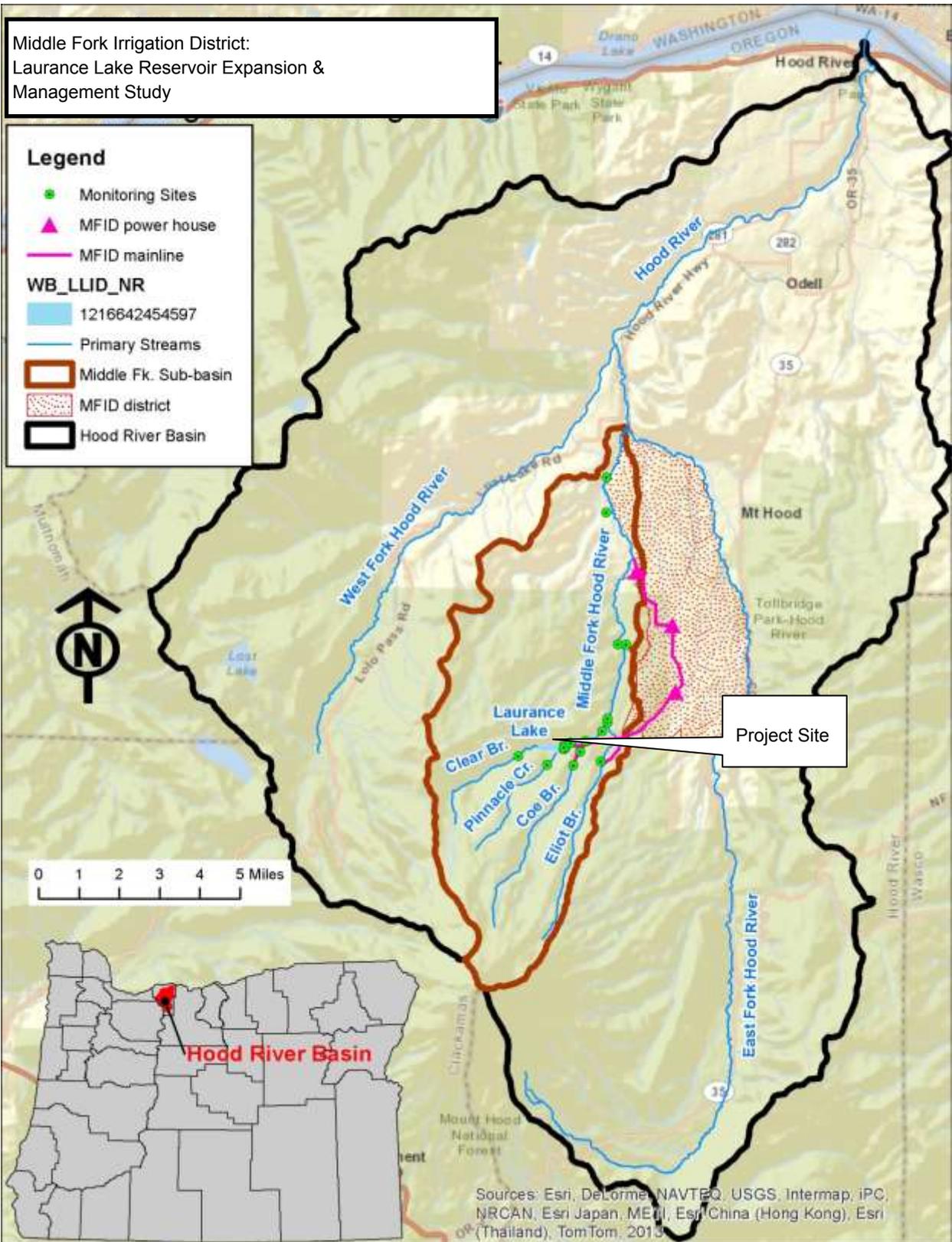
### Section VII – Feasibility Study Budget

- Section A is complete.
- Administration costs do not exceed 10 percent of the requested OWRD Grant Funds.
- If grant amount requested is \$50,000 or greater, Section B has been completed.
- All Key Tasks listed in Section B mirror the Key Tasks listed in Section VI.

Middle Fork Irrigation District:  
Laurance Lake Reservoir Expansion &  
Management Study

**Legend**

- Monitoring Sites
- ▲ MFID power house
- MFID mainline
- WB\_LLID\_NR**
- 1216642454597
- Primary Streams
- Middle Fk. Sub-basin
- MFID district
- Hood River Basin



Project Site

0 1 2 3 4 5 Miles



Sources: Esri, DeLorme, NAVTEQ, USGS, Intermap, iPC, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), TomTom, 2013

# Middle Fork Irrigation District

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P.O. Box 291  
8235 Clear Creek Rd  
Parkdale, OR 97041  
Phone (541) 352-6468  
Fax (541) 352-7794

July 28, 2015

Oregon water resources department  
725 Summer Street, NE Suite A  
Salem, Oregon 97301  
Att: Mr. John Unger

RE: Laurance lake storage feasibility study commitment

Dear Mr. Unger

By this letter the Middle Fork Irrigation district commits \$36,722 in cash and in kind funds for the Laurance lake storage expansion feasibility study. This study will assist the district and its watershed partners in the planning and decision making process as we work to become more resilient to future water challenges, support rural agriculture and at the same time reduce impacts to the environment we share.

Thank you for your consideration



Craig DeHart  
General Manager  
Middle Fork Irrigation District



# Oregon

Kate Brown, Governor

**Department of Fish and Wildlife**

The Dalles District Office

East Region

3701 W. 13<sup>th</sup> Street

The Dalles, OR 97058

(541) 296-4628



July 23, 2015

Oregon Water Resources Department  
Attention: Jon Unger  
725 Summer Street NE, Suite A  
Salem, OR 97301

Re. Laurance Lake Storage Expansion Feasibility Study

Dear Mr. Unger:

The Oregon Department of Fish and Wildlife (ODFW) supports the Hood River Soil and Water Conservation District's (SWCD) and Middle Fork Irrigation District's (MFID) proposal to conduct a feasibility study of increasing winter water storage in Laurance Lake Reservoir. As we understand, the intent of increasing storage would be to: 1) Maintain water resource reliability for district irrigators, and 2) Maintain lake levels to support releases that would meet stream temperature and stream flow needs in Clear Branch downstream of the dam. Capturing more runoff in the spring to fill the additional reservoir capacity may affect other aspects of instream fish habitat such as, channel maintenance, cues for migration, and stream temperature. These elements will need to be carefully evaluated as the feasibility study and temperature modeling results become available.

Laurance Lake and Clear Branch provide critical habitat for several anadromous species of fish listed as threatened under the Endangered Species Act, including bull trout, winter steelhead, and spring Chinook salmon. Summer instream flows on Clear Branch are below optimum levels for these species.

ODFW has participated on MFID's Adaptive Management Committee with other watershed partners. This committee has assisted MFID with developing a Fish Management Plan that recommends a number of complex infrastructure upgrades at Clear Branch dam. The results of the temperature modeling and the proposed storage increase feasibility study will assist us in the evaluation of effects to threatened fish species.

ODFW is willing to review the study results, and consult with the SWCD and MFID in order to optimize winter and summer habitat conditions in Laurance Lake and Clear Branch. Please feel free to contact me if you have further questions regarding ODFW's support for this study.

Sincerely,

Rod A. French  
Mid-Columbia District Fish Biologist



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**File Code:** 2720  
**Date:** July 28, 2015

Oregon Water Resources Department  
Attention: Jon Unger  
725 Summer Street NE, Suite A  
Salem, OR 97301

Re. Laurance Lake Storage Expansion Feasibility Study

Dear Mr. Unger:

I am writing this letter in support of the Hood River Soil and Water Conservation District's (HRSWCD) and Middle Fork Irrigation District's (MFID) proposal to evaluate the feasibility of increasing winter water storage in Laurance Lake Reservoir. Over the past few years we have been collaborating with MFID and other partners to develop flow management scenarios and proposed infrastructure changes that will increase stream flows during critical periods for all fish species in Clear Branch and the Middle Fork Hood River below Laurance Lake. At the same time MFID, USFS, and partners hope to maintain reservoir levels at the highest possible elevation, keep water temperatures in and below the reservoir within preferred ranges for all salmonids (especially ESA listed bull trout), and maintain operational capacity and flexibility for the MFID. Increasing the storage capacity of the reservoir may be an essential component to meet all of these needs.

Laurance Lake and its tributaries, Clear Branch and Pinnacle Creek, provide critical habitat for bull trout, listed as threatened under the Endangered Species Act. Downstream of the reservoir, Clear Branch also provides habitat for threatened winter steelhead trout and spring Chinook salmon. In collaboration with an Adaptive Management Group<sup>1</sup>, MFID completed a Fisheries Management Plan in 2010. This plan includes a suite of projects intended to improve reservoir management, water resource reliability, stream flow levels, fish passage, and instream habitat. Together, implementation of these projects will help MFID secure renewal of their special use permit from the US Forest Service to continue operating the reservoir and other infrastructure on federal land.

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<sup>1</sup> This group includes the USFS, USFWS, NMFS, DEQ, ODFW, Hood River Watershed Group, HRSWCD, & Confederated Tribes of the Warm Springs.



The proposed storage expansion feasibility study is a critical component of the Fisheries Management Plan, which outlines a variety of projects designed to improve conditions for fish in the Upper Middle Fork Hood River watershed and allow MFID to meet its mandate to provide water to irrigation district patrons. Please give full consideration to this worthy proposal.

Sincerely,

*Rany Orlandy for*

JANEEN TERVO  
District Ranger  
Hood River Ranger District

I am writing this letter in support of the Hood River Soil and Water Conservation District (HRSWCD) and Middle Fork Irrigation District's (MFID) proposal to evaluate the feasibility of increasing winter water storage in Cascade Lake Reservoir. Over the past few years we have been collaborating with MFID and other partners to develop flow management scenarios and proposed infrastructure changes that will increase stream flow during critical periods for fish species in the main branch and the Middle Fork Hood River below Cascade Lake. At the same time MFID, USFS, and partners hope to maintain reservoir levels at the highest possible elevation keep water temperatures in and below the reservoir within preferred ranges for all salmonids, especially ESA listed fall trout, and maintain operational capacity and flexibility for the MFID. Increasing the storage capacity of the reservoir may be an essential component to meet all of these needs.

Landowners like and us tributaries, Chin Branch and Francis Creek, provide critical habitat for fall trout listed as threatened under the Endangered Species Act. Our tributaries are the only main branch also provides habitat for threatened winter steelhead trout and spring chinook salmon. In collaboration with an Adaptive Management Group, MFID completed a Fisheries Management Plan in 2010. This plan includes a suite of projects intended to improve riparian management, water resource reliability, stream flow levels, fish passage, and habitat habitat. Implementation of these projects will help MFID secure riparian habitat and other species from the US Forest Service to continue operating the reservoir and their tributaries or riparian habitat.

The group includes the USFS, USFWS, NMFS, DEQ, ODFW, Hood River Watershed Group, HRSWCD, & Confederated Tribes of the Warm Springs



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

Oregon Fish and Wildlife Office

2600 SE 98<sup>th</sup> Avenue, Suite 100

Portland, Oregon 97266

Phone: (503) 231-6179 FAX: (503) 231-6195

Reply To: 8183.5304

File Name: 7-27-15 MFID Support letter.doc

TS Number: 15-0725

Oregon Water Resources Department

Attention: Jon Unger

725 Summer Street NE, Suite A

Salem, OR 97301

JUL 27 2015

Re: Laurance Lake Reservoir Storage Expansion Feasibility Study

Dear Mr. Unger:

The U.S. Fish and Wildlife Service supports the Hood River Soil and Water Conservation District's and Middle Fork Irrigation District's (MFID) proposal to evaluate the feasibility of increasing winter water storage in Laurance Lake Reservoir (Reservoir). This proposal is part of a larger project we support because it has the potential to improve conditions for bull trout and other species. The Reservoir and its tributaries, Clear Branch and Pinnacle Creek, provide critical habitat for bull trout, listed as threatened under the Endangered Species Act.

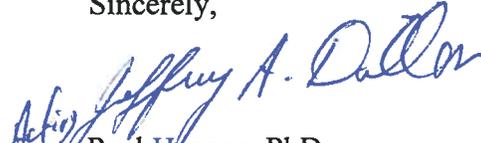
Downstream of the Reservoir, Clear Branch also provides habitat for threatened winter steelhead trout and spring Chinook salmon.

The storage increase feasibility study, as well as a current temperature modeling project, will be essential in determining whether MFID's proposed flow management strategies can meet irrigation and hydropower rights, protect bull trout critical habitat, and increase summer flows in Clear Branch. Increasing summer flows in Clear Branch below the Reservoir will likely be necessary to meet stream temperature and habitat needs for bull trout, winter steelhead trout, and spring Chinook salmon.

The proposed storage feasibility study will build on the Middle Fork Hood River Instream Flow Incremental Methodology study, and integrate with the current temperature modeling study. Over the past few years we have been participating on the Adaptive Management Committee with the MFID and other partners. We hope that this collaborative effort will result in flow management and infrastructure changes that will improve summer and fall flows in the Hood River Basin below the Reservoir, with benefits to bull trout that occupy habitat within, above, and below the Reservoir.

We appreciate your consideration of the Laurance Lake Reservoir storage expansion feasibility study. If you need additional information, please do not hesitate to contact me or Bianca Streif at (503) 231-6179. Thank you.

Sincerely,

*Acting For*   
Paul Henson, PhD  
Project Leader

# HOOD RIVER COUNTY BOARD OF COMMISSIONERS



DAVID MERIWETHER, COUNTY ADMINISTRATOR

601 State Street • Hood River, OR 97031 • (541) 386-3970 • FAX (541) 386-9392

## BOARD OF COMMISSIONERS

RON RIVERS - CHAIR  
KAREN JOPLIN - DISTRICT NO. 1  
MAUI MEYER - DISTRICT NO. 2  
BOB BENTON - DISTRICT NO. 3  
LES PERKINS - DISTRICT NO. 4

July 24, 2015

Oregon Water Resources Department  
Attention: Jon Unger  
725 Summer Street NE, Suite A  
Salem, OR 97301

Re. Laurance Lake Storage Expansion Feasibility Study

Dear Mr. Unger:

Hood River County strongly supports the Hood River Soil and Water Conservation District's (SWCD) and Middle Fork Irrigation District's (MFID) proposal to evaluate the feasibility of increasing storage in Laurance Lake Reservoir. The economy of Hood River County is primarily dependent upon irrigated agriculture, with gross agricultural commodity sales totaling \$112 million in 2012. Furthermore, agricultural producers rely almost exclusively on surface water for irrigation.

Hood River County has invested significant time and money over the past several years to investigate the future of water availability for irrigation, drinking water, and local fish populations. The County initiated a three year Basin Study, funded by the Bureau of Reclamation and OWRD, which evaluated historical and future stream flows, the potential for water conservation and additional water storage, and several water management alternatives under climate change. This study documented a significant potential and need for additional water conservation and showed that additional water storage has the potential to benefit both local fish populations and agriculture. The study also noted that the most cost-effective way of increasing water storage is in existing reservoirs. The proposed storage expansion feasibility study on Laurance Lake Reservoir is a logical next step in our effort to ensure long-term water availability for agriculture, domestic users, and aquatic life. The County understands that the location of any improvements indicated by the analysis would be on USFS property, and would therefore not be subject to Hood River County development review.

We urge you to fund this important study.

Sincerely,

A handwritten signature in blue ink that reads 'Ron Rivers'. The signature is fluid and cursive, with a large initial 'R'.

Ron River, Chair  
Hood River County  
Board of Commissioners

Cc: Craig DeHart, Middle Fork Irrigation  
Cindy Thieman, Hood River Watershed Group  
Board of Commissioners

A Small County with a big mission:  
Providing Quality of Life for all.