



WASHINGTON STATE
DEPARTMENT OF
E C O L O G Y

Application for a 2015-2017 Floodplains by Design Project Grant

Submitted applications will be rated to create a ranked list in support of Ecology's FY 2015-2017 Floodplains by Design budget request.

Applications must be submitted electronically via email to Ecology by 5:00 pm, **September 8, 2014**. Send applications to:

Adam Sant at Adam.Sant@ecy.wa.gov

With the Subject line: 2015-2017 Floodplains by Design Project Grant Application

You will receive confirmation that your application has been received by close of business on September 15.

Applicants must use this form as provided. No alterations will be accepted.

Project Title **Rambler's Park Phase IV (Nelson Dam overflow channel)**

Organization/Jurisdiction Name **Yakima County Public Services**

Contact Name **Terry Keenhan**

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City, State, Zip Code

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Legislative District(s) **14th District**

County **Yakima**

WRIA(s) **38**

Congressional District(s) **4th**

Specific Project Location

Section 9 Township 13 Range 18

River Mile 3

Latitude 46.632480 Longitude -120.588743

GPS coordinates, if available

Major Watershed Project is in Naches River

Full project (or phase proposed herein) should be completed in 3-4 years.

Project Narrative and Budget are limited to 20 pages.

Scope of Work, Schedule, Maps and Photos can be in addition to those 20 pages.

1. Short Description of Project (500 words or less)

Remove the former Powerhouse Road Bridge abutment and approach road and construct a new fish friendly boulder-bed overflow channel around the to-be reconfigured Nelson Dam in order to reduce flood impacts to SR12, the City waterline, businesses and residences. The overflow channel, to be constructed already obtained County land, will increase flood and fish passage capabilities of the dam. The current fish passage restrictions to Salmon and ESA species at the present dam restrict their movement up the Naches River. This project is Phase 4 of the County involvement in the Rambler's Park levee and Nelson Dam reconfiguration that followed the County replacement of the old Powerhouse Road Bridge with a larger bridge in a new road alignment. This Phase 4 project includes the reconfiguration of Nelson Dam (costs by partners), a dam/bypass design memorandum to ensure compatibility, and the design and construction of the overflow channel around Nelson Dam. (see Figure 3)

Phase 1, already completed and funded by the County, the Corps and Emergency FCAAP fund, is the purchase of land and setback of the lower 1500 feet of Rambler's Levee (N-1). Phase 2, is the movement of a wrecking yard and setback of the upper 1500 feet of Rambler's Levee (N-1) and is funded by 2013-2015 FBD and planned over the next 3 years. Phase 3 is the purchase of opposing (right bank) and channel properties to enable pilot channel development through old sediments, is funded by SRF and currently underway. Phase 4 is the last step of a multi-million dollar expenditure including the new Powerhouse Bridge, road alignment and floodplain purchases (additional \$8 million expended including acquisitions) and the new Nelson Dam (approximately \$10 million).

The objectives of the County FCZD in this reach are to reduce backwater from infrastructure and improve sediment transport to stop and reverse the ongoing channel aggradation in the Rambler's Park reach – efforts that will reduce flood risk to all parties, improve habitat and fish passage. The current constrictions result in sediment deposition and flanking flow around the levee at flood flows (See Figure 1a). The project is part of the reestablishment of normal river processes along the twelve mile Lower Naches River reach at four County levees (Town of Naches, McCormick, Eschbach and Rambler's Park Levees) that were identified as priorities within the 2006 Lower Naches Comprehensive Flood Hazard Plan. The County is setting back its levees between the Town of Naches and Rambler's Park to open up habitat and side channels, increase flood conveyance, reduce flood risk, mobilize levee-induced sediment deposits upstream of the levees, and reestablish more natural sediment processes for movement of the released and normal sediment loads. These activities reduce flood risk, reactivate degraded habitat functions and reactivate lost habitat.

2. Flood hazard / risk reduction (60 points)

Describe your project and how it will reduce the magnitude or frequency of flood damages to people, structures or infrastructure. Projects will be evaluated on the significance of the flood hazard and the ability of the solution to address the hazard. Evidence of flood hazard reduction can be demonstrated via flood storage added (acre-feet), flood stage reduction [reduced BFE (base flood elevation)], conveyance increased (cubic ft/sec), sediment storage added or inputs reduced (return to more natural process by dam lowering and widening -Other phase –pilot channels remove sediment initiating natural processes), number or value of structures and/or development rights removed from hazard area (# or areal extent), critical facilities removed from high hazard area, transportation and infrastructure facilities removed from high hazard areas, and other project-specific goals. Describe both upstream and downstream effects of your project.

Answer question 2 here: The dam, levee and adjacent infrastructure create multiple constrictions producing river bed aggradation upstream for several miles and sediment starvation downstream that is currently threatening the City waterline (repairs in 2011). These ongoing conditions are leading to ever-increasing flood water surface elevations of 3 to 5 feet during the 100-year flood, expanding regulatory floodplain and floodways over a very large area and increasing flood hazard (see Figure 1b). The Nelson

Dam will be reconfigured in Phase 4 concurrently by others, most likely reduced from a 8 foot to a 4 foot structure, and the adjacent old bridge abutment and approach blocking by-flow pass be removed and replaced with the rock weir, allowing flood elevations, when combined with other Phases, to drop between 3 and 6 feet in the reach for all flows. The reduction in flood elevations for the 10 to 100-year floods are shown in Figure 2. This project along with the other Phases will drop regulatory flood plains and reduce the floodway. The threat of closure to Powerhouse Road and SR12 at this location will be removed for flows up to the 50-year flood. Flooding in residences and businesses will be similarly reduced. Depending on the flows the conveyance will be increased up to 5,000 cfs.

3. Floodplain ecosystem protection or restoration element (60 points)

Describe the ecological benefit of the project, its significance, and the ability of the solution to address the overall need in the project area or watershed. Examples include, but are not limited to, reconnecting floodplains, salmon recovery actions, habitat restoration, Channel Migration Zone protections, etc. Evidence of ecosystem benefits include floodplain (including estuary) habitat type (e.g., wetland, side channel, forest) and area restored (# acres), floodplain area protected from bank armoring (# of acres), floodplain area protected from development or other land use change (# acres), hardened bank removal or levee/riprap removal (linear feet), levee setbacks constructed (linear feet, # acres), new side channels or reconnection of old side channels (linear feet or storage volume), salmon species benefitted (# of listed, non-listed species). Secondary evidence includes culvert replaced to restore fish passage or increase conveyance, logjam and or wood structures installed, riparian area planted, and other project-specific goals.

Answer question 3 here: Nelson Dam on the Naches River has interrupted normal sediment transport, resulting in a perched and chronically unstable river channel for 2.5 miles upstream of the dam, and an incised and coarsened bed downstream of the dam. While earlier phases of this project have reduced constrictions, improved flood conveyance, and rebuilt flood protection levees, this action of dam replacement and construction of the bypass will restore sediment transport. Currently, Coho Salmon are released in the reach upstream of the dam, and many return to spawn there. Egg to fry survival in this reach is near zero due to the chronic channel instability and scour associated with the annual spring runoff, this area of instability of a single thread channel expands upstream with each new flood. While the new bypass will not immediately result in improved channel stability (the accumulated sediment will migrate out of the reach), it will begin the process of returning the channel to the low point in the floodplain and restoration of hyporheic flow conditions through more complex river pattern in this reach. When we have implemented similar projects designed to release accumulated sediments elsewhere, the effects on the channel condition downstream have been positive as well. The channel downstream will begin to migrate and side channels will develop or re-appear. The FCZD has acquired almost all of the floodplain property downstream (costs not included) to allow these processes of channel regrade and floodplain recovery to occur for 3 miles downstream. In sum, this project restores habitat forming processes to approximately 5 miles of mainstem river channel. The channel in Rambler's Park itself should have been the most productive reach in the lower Naches River prior to dam construction, based on that reaches position in the lower valley adjacent to the natural bedrock controls which would have encouraged a large volume of hyporheic and upwell groundwater flow from the materials in this very coarse floodplain.

By removing vertical and lateral constraints to the floodplain the project is designed (see above) to increase the responsiveness and vibrance of the system to future changes as opposed to control response and fight change. Resistance (in the channel) is futile (and expensive). Based on a hydraulic modeling design that reduces lateral and vertical restrictions the project will mobilize long term stored sediment to return the system towards increases floodplain connectivity, increased sediment mobilization and more normal sheet deposits with reasonable turn over periods, all of which increase the cooling hyporheic flows and floodplain food web and vegetation towards balance with sediment loads. Reach long (13 miles) sediment models are currently under construction by the Corps

Additionally, the fish ladder at Nelson Dam does not currently provide adequate passage to salmonids. Depending on flow conditions, the upstream and/or downstream entrances to the ladder can be plugged by sediments as the ladder sits on the inside of a river meander where sediment can be expected to accumulate. In some years, WDFW will close the ladder during spring runoff and after irrigation season to prevent this plugging problem. When the ladder is closed or plugged during the spring, it prevents or delays migration for Spring Chinook and the ESA listed Steelhead, when the ladder is closed during the non-irrigation season, it can also prevent passage of Coho, as occurred in the full blockage event in October of 2011. With the reintroduction of summer Chinook and Sockeye to the Naches River, these passage problems will only get more severe. Provision of a roughened channel, fish passable bypass will reduce or eliminate the upstream passage problems which exist at the current dam structure.

4. Is your project in a Puget Sound Partnership Priority Floodplain? (5 points)

(Deschutes, Dungeness, Duwamish/Green, Elwha, Hood Canal, Lake Washington, Lower Skagit, Nisqually, Nooksack, Puyallup, Sauk, Skokomish, Skykomish, Snohomish, Snoqualmie, Stillaguamish, Upper Skagit)

Answer question 4 here: Yes

No X

5. Other benefits (40 points)

Describe how your project maintains or improves agricultural viability, water quality, public open space/recreation access, economic development, or other important local benefits or values, and does not conflict with other objectives of this program. Projects receive points based on the importance of the result produced, the ability of the solution to address the overall stakeholder need and the long-term improvement.

- a. Agricultural viability (evidence of agricultural benefits include reductions in flooding (acres), protection from development (acres), improvement of drainage infrastructure (acres), or other capital or non-capital benefits to agricultural productivity).
- b. Water quality improvement [e.g., through storm-water infrastructure upgrades, treatment of a TMDL or 303(d) issue, reduction in sediment, restoration of wetlands or riparian areas, implementation of related best management practices, etc.].
- c. Public access and recreation (e.g., through land acquisition, the development of trails or other recreational infrastructure, etc.)
- d. Other floodplain values or services of local importance.

Answer question 5 here: In terms of dollars, Yakima County is the number one County producer of agricultural products in Washington State and number two for processing of agricultural foods. Those products are primarily derived from the diversion of Naches and Yakima Rivers flows. Nelson Dam contains an irrigation intake supplying 2 diversions. Following reconfiguration an additional 2 diversions downstream that impact habitat would be removed and relocated to the dam. This is a more robust solution with less maintenance.

Sediment imbalances and simplified river structure in this reach due to the dam and guidance levees have led to the river being perched above the floodplain, reduced abilities of the river to absorb, assimilate and reduce pollutants within the floodplain, and reduced availability of side channels and normative hyporheic function that reduces river temperatures and promotes a food based web. The project is the single most important step to move this reach out of a simplified river structure and move to restore the river channel as the low point in the floodplain, restoring hyporheic flow conditions.

6. Cost-effectiveness (20 points)

- a. Project will be judged on whether the budget is appropriate to the project scope, and designed for project success.
- b. Describe how the project will be continued or maintained after the grant has been completed.
- c. If project cannot be fully funded, explain how the project could be scaled downward.

Answer question 6 here: a) This project builds on the realignment of and Powerhouse and its new

bridge plus Phases 1 through 3 which are already funded. B) The structural improvements will require cooperation between the dam owners, the County, the Bureau and WDFW. This is a continuation of the current dam operation arrangement and will require the provision of an easement from the County to the dam owners.

7. Long-term cost avoidance: (30 points)

- a. Describe how your project minimizes or eliminates future costs for maintenance, operation, or emergency response. **(15 points)**

Answer 7.a. here: Reduces damages and risk to four (4) bridges, Nelson Dam and the new Rambler's Park Levee including that from flanking of Rambler's Levees from overflow paths that result from sediment wedges behind the dam for flood events exceeding the 10 year flood.

- b. Describe how your project accounts for expected future changes to hydrology, sediment regimes, or water supply resulting from other floodplain management efforts, land use changes, extreme weather events, or other causes. **(15 points)**

Answer 7.b. here: As noted in 2 and 3 above the project is designed to reverse ongoing degradation and increase the responsiveness and vibrance of the system and system sediment deposits to future changes as opposed to control response and fight change. A return to natural processes and natural responsiveness increases the robustness of the system to increase currently curtailed flood risk and habitat benefits (natural cooling and oxygen levels in deposits). Key to that is the return to normative sediment movement through the system. Reach long (13 miles) sediment models are currently under construction by the Corps.

The Yakima basin runoff is managed by five Bureau dams to prolong snowpack runoff, and has extensive flow rule management to allow maximization of benefits to both agricultural and habitat sectors. The combined storage volumes of the dams is only 30 percent of the average annual basin runoff, so that modifications of the snowpack have significant implications. Increased drought frequency has occurred since the 1970's and led to the recent efforts by basin and State interests to provide more storage within the basin. This snowpack change has been attributed by many to due to the climate warming trend impact on snowpacks, also seen in the recent disappearance/recession of the nearby North Cascade glaciers.

The Yakima Basin, being located on the lee of the Cascade range, is probably the basin within Washington State that it is most vulnerable to snow pack modification through climate change. Macro models have indicated probable temperature increase and minor increased precipitation in the basin due to climate change. The use of micro models will show however that the effect of increased temperature will cause much of the snow currently carried over the Cascade crest to not reach the Yakima basin at all due to the state change converting near flat snow trajectories to near vertical rain trajectories. A huge volume of precipitation now reaching Yakima basin will not reach the basin due to a warming of only one degree. This phenomena was studied by BC Hydro and National Weather Service for the Bridge Basin in BC during the 1990's. Altered snow packs and glacier retreat will change available sediment loads and flood nature/ sediment transport. In summary climate change impacts probably will reduce Yakima basin runoff volumes and temperatures making hypohoric flows in floodplains, as proposed in this grant, more important for ESA and Salmonid species sustainability on the Columbia and in Eastern Washington.

We are interested in collaborating with NOAA, the UW Climate Impacts Group, and other partners to evaluate and quantify climate change impacts that could affect project design and implementation. We believe that designs should maximize the design elements/benefits noted above in this section that contribute to robustness in the face of change.

8. Demonstration of need and support (30 points)

- a. Describe how your project is consistent with the intent of existing floodplain management or habitat recovery plans or is specifically identified through existing plans or work programs. (Elements of the project may have been developed through more than one planning process. Please identify the planning process used for each major element if they are not from a common plan.) (15 points)

Answer question 8.a. here: All Phases are in concert with the 2006 Lower Naches Comprehensive Flood Hazard Management Plan which identified remedial measures for the Rambler's Park Levee reach. This was the highest priority location in the plan. Of major issue is the impact of this dam and the old Powerhouse bridge abutments and approach on adjacent infrastructure. This project is supported by the habitat committee of the Yakima Basin Implementation Plan, as important to basin habitat recovery, and reviewed by the Technical Committee of the Recovery Board. Replacement of Nelson Dam is included in the BPA basin priorities

- b. Describe which flood control authorities, Tribal Nations, local governments, lead entities, key stakeholders or decision-makers representing floodplain interests located within the river reach or affected by the project have provided letters of support explicitly endorsing the project and its outcomes for their interests. (15 points)

Answer question 8.b. here: The Yakima Flood Control Zone District has authority to perform actions in the floodplain. Letters of support related to this overall project (Rambler's Park will be submitted by September 22, 2014)

9. Readiness to proceed and complete the proposed phase of the project (25 points)

Describe how your project is ready to proceed with the scope of work, and your capacity to complete the project successfully and maintain it over time, including your project schedule and deliverables. Describe your experience with similar projects. If your project is acquisition only, describe how you will complete floodplain restoration subsequent to the acquisition.

Answer question 9 here: Phase 1, the acquisition of the Wells property and setback of the lower 1400 feet of Ramblers PL84-99 levee was completed in the fall of 2013. Phase 2 is partly funded by Ecology. Yakima County has purchased part of the Phase 2 land, completed the preliminary design for Phase 2, and is purchasing river land for pilot channels. The SEPA has been completed for all phases. Levee construction plans for Phase 2 are virtually identical to Phase 1. Phase 3 is the acquisition of land on the opposing Naches River right bank, removal of right bank levees and creation of pilot channels. We would start the design compatibility and partner agreement and do not expect capital part of this project to start until 2017

10. Pilot project and leverage opportunities (25 points)

- a. If applicable, describe how your project could serve as a pilot effort or result in changes or results with broader impacts to the state. (10 points)

Answer question 10.a. here: We believe our approach of maximizing conveyance by restoring natural riverine grades and processes and allowing the riverine processes to do most of the work reduces long term impacts and time to reestablishment of a more natural regime. We are doing this by removing horizontal and vertical constraints through levee removal and setback, dam lowering and by-pass coupled with the use of pilot channel, to strategically use the increased energy grade created over time (sediment deposition) by the man-made constraints. This is in contrast to efforts by others in the State to increase grade by deflection structures (more constriction and reduced conveyance). The former approach returns the river back to its natural processes, while the other increases the imbalance, will worsen the situation (more problems) and therefore have short life spans. Also this approach moves to reestablish sediment balance through the removal of restrictions and the resulting sediment deposition zones that

further create imbalance. This project will also be a pilot for redesign of water diversion dams to reduce those dams effects on sediment transport. Seeking ways to reduce dam height through new fish screen technology (flat plate screen) and alternatives to gravity (supplemental low head pumps) and fish friendly by-passes can dramatically reduce the effect of these structures on sediment transport, improve upstream and downstream fish passage, and reduce maintenance and operational costs.

- b. If applicable, describe how your project leverages existing investments, such as SRFB, FCZDs, Dike Districts, TMDLs, WWRP, ESRP, NEP, and other funding sources. Evidence of this will be based on the amount and diversity of the leveraged funding sources. **(10 points)**

Answer question 10.b. here: The County has already provided considerable funds for Powerhouse Road and Bridge relocation (\$8 million) plus Phase 1. Phase 1, funded by the County, the Corps and Emergency FCAAP fund, is the purchase of land and setback of the lower 1500 feet of Rambler's Levee (N-1), and is complete. Phase 2, the movement of a wrecking yard and setback of the upper 1500 feet of Rambler's Levee (N-1) is funded by FBD and planned over the next 3 years. Phase 3 is the purchase of opposing (right bank) and channel properties to enable pilot channel development through old sediments, is funded by SRF and currently underway. The new overflow channel will be constructed to be fish-friendly and provide fish passage during high water events when passage at the fish ladder is not available. Phase 4 is the last step of a multi-million dollar expenditure including the new Powerhouse Bridge, road alignment and floodplain purchases (\$8 million) and the new Nelson Dam (approximately \$10 million).

Phase 4 funds for Nelson Dam reconfiguration will be supplied by BPA, the Bureau and the City. Additional funds from WFW and USFW may be available for the fish by-pass.

- c. If applicable, describe how your project addresses inequity or social justice issue by benefitting underserved communities. **(5 points)**

Answer question 10.c. here: The Department of Ecology and Yakima County were recently sued by the owner of a mobile home park in the floodway near this proposed project. Because the mobile home park is in the floodway, the residences in the park cannot be "substantially improved". In the court case at hand, the owner wanted to replace a pre-1974 (does not meet current fire or health code) mobile home with a newer model that would meet current code. The expanded floodway that resulted from loss of sediment transport has a regulatory effect that requires lower income residents to remain in substandard housing which does not meet current health and safety codes. Restoration of sediment transport should result in a reduction in the extent of the floodway on adjacent parcels, and allow these residences to be "substantially improved".

11. Budget (add more tasks as needed).

Task	Amount Requested from Ecology*	Other Funding for Project** (20% of Total Cost Minimum)	Total Cost
Task 1--Administration	80,000	20,000	100,000
Task 2—Completion of design with partners/cooperators including an agreed on “Design Memorandum”	160,000	40,000	200,000
Task 3—Yakima County obtains all necessary permits	80,000	20,000	100,000
Task 4 –Complete construction of fish-friendly overflow channel	1,680,000	400,000 land purchase	1,600,000
Total	1,990,000	500,000	2,490,000

*Amount requested from Ecology under this grant program

**Other sources of funding dedicated to this project. Insert narrative below that details what the source of funding is and whether or not it has been received or applied for but not yet received. Match must be at least 20% of Total Project cost.

Narrative and/or Table of other funding sources for project, here: The match will be provided by the cooperators /partners listed below. The match has not been committed at this time, but will require agreement with the cooperators and will be included in the “Design Memorandum.” Some of the match will come from in-kind land contributions from previous phases and from materials.

This project has a number of partners and cooperators that support this project and have committed potential financial support. Partners include the following: Bureau of Reclamation, City of Yakima, Washington State Department of Fish and Wildlife, Corps of Engineers, National Marine Fisheries Services, Yakima Basin Fish and Wildlife Board, and the Yakama Nation.

If it’s not possible to fully fund this proposal, please describe a *phased* approach that would still significantly advance the effort:

12. **SCOPE OF WORK:** Please attach a Scope of Work and schedule. If your proposal is a phase of a larger multi-year project, please place this proposal in the context of the overall project and provide preliminary cost projects to complete the project.
13. **Maps:** Please attach at least two (2) maps to your application. The first map should be a vicinity map and the second should be a map of your project.
14. **Planting Maintenance/Survival:** If your project includes plantings, please provide a description of how you will ensure plant survival and maintenance.

15. **Photos:** Photos are not required, but if you think they enhance our understanding of your application, please include them. We are particularly interested in "before" photos that can be matched with "after" photos.
16. **Executive order 05-05, Archaeological and Cultural Resources** (online at http://www.governor.wa.gov/office/execorders/eoarchive/eo_05-05.pdf) directs state agencies to review all capital construction projects for potential impacts to cultural resources to make sure that reasonable action is taken to avoid adverse impacts to these resources. If this grant program is funded by the 2015 Legislature, successful grant applicants will be required to submit additional information to Ecology to comply with this Executive Order.

Additional factors in ranking and award: This is a very new funding source. To ensure that projects meet the objectives of the program, these additional factors will be considered in creating the proposed funding list:

- **Balance of project types:** Balance funding ready-to-proceed construction projects with funding pre-construction activities. This balance in project types is vital to ensuring success over time.
- **Geography:** There is strong interest in ensuring that projects in all areas of the state receive funding.
- **Advancing multi-benefit floodplain management:** It is important that the project list advance the principles and practical application of multi-benefit floodplain management.

Certification

I certify to the best of my knowledge that the information provided above is true and correct and that I am legally authorized to sign and submit this information on behalf of the organization applying for this grant.


Signature


Date

Terry Keenhan, Water Resources Division Manager

Printed name and Title

Yakima County Public Services

Name of Organization Applying for Grant

