From: Dollie & Scott Barrr [dsbarr@plix.com]
Sent: Thursday, December 24, 2009 4:36 PM
To: Haller, Daniel R. (ECY); npetersen@landscouncil.org
Subject: response to beaver storage proposal

Mr; Petersen: I have been, for a long time, a great believer in what the Beavers are doing to delay spring runoff and obviously enhance underground water supplies somewhere downstream later in the season at a time when it is needed.

It only makes common sense to the extent of adding more water during the time of excess runoff. This is worthwhile, in my opinion. It is pretty cost efficient storage construction.

Causion should be taken not to over-state the amount of water saved. During excess flow time is the only time of year there is more water. This statement could be challenged if the level of the beaver dam's capacity is constant the year around. If the spring-time runoff is to be credited to the beaver dam recharging the subsurface capacity and the dam remains at maximum capacity the year around, obviously that leaves some question as how to calculate the benefit of the dam.

Additional evaporation compared to a non beaver situation is a factor.

There is a substantial economical benefit to me on my riparian areas where there are beaver dams because of the additional grass produced. Especially during mid to late summer when green pasture is more scares.

Years ago I built small dams, with trickle outlets' on my drtyland wheat ranch. They worked great until we improved our farming practices to avoid runoff. We called them "Beaver Dms"

I am, since the start, of the WRIA 59, where I live, and WRIA 43, where my land is, wtershed planing groups and a strong believer that the WRIA groups have a substantial say in the water issues that effect the citizens of their WRIA. Please give this the utmost consideration.

Scott Barr

Leo Bowman
District 1
Max Benitz, Jr.
District 2
James Beaver
District 3

Board of County Commissioners
BENTON COUNTY

David Sparks
County Administrator

Loretta Smith Kelty
Deputy County Administrator

RECEIVED
JAN 06 2010
DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

28 December 2009

Dan Haller
Office of Columbia River
Washington Department of Ecology
15 West Yakima Avenue – Suite 200
Yakima, Washington 98902-3452

Re: "Beaver Storage"

Dear Mr. Haller,

Benton County is in receipt of the Office of Columbia River's (OCR) notice requesting consultation on whether new permits from the Columbia River can be issued based on water supplies developed through the introduction of beaver into tributary watersheds. We thank you for the opportunity to provide input on the matter.

Beaver are indeed an amazing, native species. Once maligned and eradicated from entire watersheds, their value to the ecosystem is only recently gaining the widespread appreciation it deserves. Beavers' abilities to transform entire drainages from channelized, inert streams into diverse, flourishing communities are often understated. It is encouraging to see that Ecology recognizes the many benefits of naturally-occurring beaver populations in our watersheds, one of which is slow-release water storage.

One of the keys here is "naturally-occurring". Beaver are an excellent colonizer of new territories, and when left alone by humans, they will do just fine in repatriating the stream systems from which they were previously exiled. The only assistance they need from the government is to get out of the way. It is our opinion that with State budgets are strained as they are, redundancy does not serve any of us well, and Ecology should probably not be getting into the wildlife management business when we already have an agency charged with that function – the Department of Fish and Wildlife.

Scale is the other key issue. As Benton County has been working with Ecology and many other interested parties on the renewal of the Yakima River Basin Watershed Enhancement Project, it has become clear to all us how inadequate the system developed in the early 1900s is for meeting the needs of the 21st Century. We need to

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commissioners@co.benton.wa.us

be applying ourselves to discussing big, bold projects that overhaul and reinvent the entire storage and conveyance system in the Yakima Basin and beyond. Meanwhile, Ecology is distracted and spending its energy (and dollars) off on a tangent asking if new permits should be issued for 250 acre-feet of water puddled-up by some rodents.

While that 250 acre-feet might help someone water a few acres of apples in Pateros, we need real water storage solutions here in the Yakima Basin. Irrigators and local governments have consistently talked about the need for new water storage on the order of around *1 million acre-feet*.

The specific question that OCR asked in the notice was, *"if 250 acre-feet of water is demonstrably stored through the pilot project, could Ecology issue 165 acre-feet in new uninterruptible Columbia River permits?"* Our response to that question at this time is no. For one, the numbers are miniscule; for two, beavers are animals susceptible to disease, depredation, and their own whims, and their handiwork can be undependable and wiped-out by floods; and for three, Ecology needs to keep its eye on the ball and focus on substantive, meaningful remedies for sufficient and reliable water supplies for the long-term. To the extent that beaver populations thrive in our watersheds and improve habitats and small-scale natural storage, that should be considered a bonus for everyone; but it is not a substitute for real solutions to real problems.

In closing, we reiterate that Ecology and stakeholders in the Columbia Basin need to reel themselves in from impractical, quixotic adventures such as "beaver storage". It is time to quit nibbling around the margins and deal with these water issues head-on. Again, as always we thank you for the opportunity to participate in this discussion and will continue to be available for further consultation on these issues that are crucial to our future here in Benton County.

Sincerely,

BOARD OF COUNTY COMMISSIONERS

James Beaver, Chairman

cc: Washinigton Department of Fish and Wildlife – Region Three
Yakima County Board of Commissioners

ajf

Department of Energy

Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

POWER SERVICES

January 12, 2010

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JAN 19 2010
DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

In reply refer to: PGF-6

Derek Sandison, Director
Office of Columbia River
Department of Ecology
15 West Yakima, Suite 200
Yakima, WA 98902

Dear Mr. Sandison,

Thank you for seeking our comment on the proposed pilot project of The Lands Council to demonstrate water storage and releases from beaver ponds. We appreciate the opportunity.

The Bonneville Power Administration (BPA) works with its regional partners, including the U.S. Army Corps of Engineers and the Bureau of Reclamation, to estimate the potential storage volumes and water release timing that will support firm energy generation capacity from the Columbia River and its tributaries. We follow closely Washington's Columbia River Program for its identification of potential new storage opportunities.

Also, as a major funder of fish and wildlife mitigation and enhancement in the Columbia River, we appreciate the role restoring natural beaver activities in tributaries may play in the Columbia's ecosystem health. We are not aware, however, of capabilities to accurately forecast the volume and timing of water releases from beaver ponds. We also believe that the actual volume of storage may vary in timing and location due to the ephemeral nature of beaver pond creation. To have applicability to Columbia River hydrosystem planning, we would need to understand how the timing and volume of storage releases would be forecast and the likelihood that those volumes could be relied upon for a number of years.

These comments come only from a hydrosystem planning perspective and not intended to be critical of the value such a pilot project might have for tributary ecosystem health. If you have additional questions, please feel free to contact me at 503-230-3470 or Rob Swedo, Constituent Account Executive for Washington at 509-625-1347.

Sincerely,

Mark A Jones

Mark Jones, Manager, Federal Hydro Projects
Bonneville Power Administration

cc:
Dan Haller, Columbia River Engineer, Office of Columbia River
Rick Roeder, Operations Supervisor, Office of Columbia River
Mike Petersen, Executive Director, Lands Council

From: Haller, Daniel R. (ECY)
Sent: Thursday, January 14, 2010 9:24 AM
To: Haller, Daniel R. (ECY)
Subject: Beaver Consultation Phone Log--Brian Crossley, Spokane Tribe

I spoke with Brian Crossley with the Spokanes during the week of January 4, 2010. He had called about several items, one of which was the request for consultation on the Land Council proposal for beaver reintroduction. He indicated the Spokanes would not be sending a formal letter. He shared that he thought that beaver introduction could have positive effects on groundwater recharge and temperature. However, he was dubious about issuing new water rights based on beaver introduction. Beavers are very dependent on the availability of riparian vegetation and without it, they won't stay. His experience is that successful introduction tends to be very site specific.

Daniel R. Haller, P.E.
Office of Columbia River
Department of Ecology, Central Region Office
15 W Yakima Ave, Suite 200
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(509) 454-4255 phone
(509) 575-2809 fax
dhal461@ecy.wa.gov

State of Washington

Department of Fish and Wildlife

Mailing Address: 600 Capitol Way N. ● Olympia, WA 98501-1091 ● (360) 902-2200, TDD (360) 902-2207
Main Office Location: Natural Resources Building ● 1111 Washington St. SE ● Olympia, WA

January 4, 2010

Dan Haller
Office of Columbia River
Washington State Department of Ecology
15 West Yakima Avenue, Suite 200
Yakima, WA 98902-3452

RE: Consultation on Beaver Storage and Issuance of New Columbia River Permits

Dear Mr. Haller,

Thank you for your invitation to consult on whether new water right permits from the Columbia River can be issued based on water supply developed through reintroduction of beaver in tributary watersheds. Your specific example asks whether 165 acre-feet of new uninterruptible Columbia River mainstem water right permits can be issued based on 250 acre-feet of water demonstrably stored through the pilot beaver relocation project.

In general, having beaver in watersheds is beneficial to fish and wildlife and to overall hydrology. Beaver dams create wetland areas that retain rain and snowmelt, trap sediment making streams cleaner, increase ground water levels, and create habitat for fish and wildlife. WDFW finds The Lands Council's "Beaver Solution" – reintroducing beavers to build dams to store spring runoff – to be an interesting concept worthy of further investigation. With respect to the specific proposed relocation sites, we would expect localized instream benefits to fish at all of these sites. Redband rainbow trout, which are of conservation importance to WDFW, are present at the California Creek and the Bacon Creek sites.

The methods to estimate benefits are generally acceptable. Most volume estimation assumptions appear reasonable, although they remain ephemeral in that they are still only assumptions. Actual on-site measurements would be needed in every case and over a long time period in order to validate

project estimates. One variable not accounted for in the storage volume estimate is whether water rights downstream of the beaver pond are capable of taking the additional water before it reaches the newly-permitted point of diversion.

Beaver dams tend to increase the density and diversity of riparian vegetation along streams, and are often reintroduced for specifically this purpose, however WDFW is concerned about the potential for impact of beaver activity on riparian habitats that support species of critical concern. For example, downing of a nest or roosting tree would have significant short-term and long-term impacts to specific species. WDFW is supportive of the sites chosen for relocation pilots. Careful site screening, beaver-proofing, and project monitoring measures can ensure that proposed new sites avoid negative wildlife impacts.

Although we support the concept and the pilot, WDFW doubts whether a widespread relocation program would be successful. While the proposed pilot sites have been thoroughly vetted with landowners and local citizens, expansion of the program might not be met with the same level of local enthusiasm. Beavers currently exist where there is good beaver habitat, unless they are being actively and intensively removed. Removal is an issue because it invalidates the assumption that flow benefits would be long-term.

In addition to considering potential benefits from beaver relocations, WDFW must take into account potential impacts to agency resources should nuisance beaver problems result from a broader program. WDFW commonly receives requests to remove beavers and their dams throughout eastern Washington in response to flooding of private property and homes, damage to docks and ornamental vegetation, and flooding of county and state roads and other infrastructure.

WDFW's major concern is Ecology's desire to issue permanent, uninterruptible water rights based on the water input attributed to beavers. Our concern is based on two fundamental issues: 1) it is difficult to validate that a net additional increment of water is achieved in the mainstem at the site of proposed new water right permits; and 2) beaver colonies and dams are not permanent to a specific location.

Proposed and candidate locations for beaver reintroduction are problematic in terms of documenting benefits to the mainstream Columbia River. Four of the five proposed sites contribute to Lake Roosevelt. Since releases out of Lake Roosevelt are already tightly managed, it would be difficult to imagine that the modest volumes accrued from new beaver activity would be detectable within and downstream from Lake Roosevelt. The Rock Creek

site flows southwesterly into the Palouse-Snake drainage, so any hydrological effects would not be available upstream of the mouth of the Snake River. For any proposed and future new "beaver" water, it would be difficult to validate the net volume of added water intended to offset new withdrawals.

Beaver colonies and associated dams are not static, and dam locations and water storage characteristics change over time. There is no long-term broad-scale accounting of beaver population size, number of beavers that are trapped, beaver dams that are removed by humans or floods, or when beavers naturally abandon their ponds and dams. When viewed in this light, it makes no more sense to issue new permanent water rights based on beavers than it does on other temporary increases in water storage, whether it's from a log jam, a natural slide event, or based on one or two exceptionally wet water years. The localized, and potentially short-term, habitat improvement and groundwater recharge values that would be enhanced via these beaver relocations seem straightforward; however it is difficult to see how actual cumulative value to deliverable water in the mainstem Columbia River would be verified.

In general, more beavers are better in terms of restoring ecosystem function and WDFW remains supportive of The Lands Council pilot project proposal. However, WDFW does not support the issuance of permanent water right permits as a result of developing the "beaver" water source.

Sincerely,

Kevin Robinette, Acting Region 1 Director

Dennis Beich, Region 2 Director

From: Haller, Daniel R. (ECY)
Sent: Thursday, January 07, 2010 8:29 AM
To: Haller, Daniel R. (ECY)
Subject: RE: beavers--phone memo to file

I spoke with Kent yesterday by phone returning his call on the beaver consultation letter. Cowlitz county has a lot of problems with beaver introduction, plugging culverts, overflowing roads and private property/right-of-way. They've contracted with USDA to trap and remove the beavers but removing the dams is very difficult. He is opposed to their introduction in areas where conflicts could arise in this manner.

Daniel R. Haller, P.E.
Office of Columbia River
Department of Ecology, Central Region Office
15 W Yakima Ave, Suite 200
Yakima, WA 98902-3452

(509) 454-4255 phone
(509) 575-2809 fax
dhal461@ecy.wa.gov

From: Cash, Kent [mailto:CashK@co.cowlitz.wa.us]
Sent: Wednesday, January 06, 2010 4:55 PM
To: Haller, Daniel R. (ECY)
Subject: RE: beavers

Dan -

Thanks for the opportunity to provide input on the "Beavers Storage and Issuance of New Columbia River Permits" issue.

Kent A. Cash, PE
Director / County Engineer
Cowlitz County Department of Public Works
1600 - 13th Avenue South
Kelso, WA 98626
Phone: (360) 577-3030
Direct: (360) 414-5566
Fax: (360) 636-0845
E-mail: cashk@co.cowlitz.wa.us

FRANKLIN COUNTY

BOARD OF COMMISSIONERS

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JAN 13 2010
DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

January 11, 2010

Mr. Derek I. Sandison, Director
State of Washington
Department of Ecology
Office of Columbia River
15 W. Yakima Avenue, Ste 200
Yakima, WA 98902-3452

RE: Consultation on Beaver Storage and Issuance of New Columbia River Permits

Dear Mr. Sandison,

Your program of introducing beaver in tributaries of the Columbia River for a natural alternative to man-made storage dams sounds interesting.

Even though Franklin County would not be considered for the program, we would like to be placed on a mailing list to receive updates on the progress of the program and how landowners are impacted.

Sincerely,

Fred Bowen
County Administrator

1016 North 4th Avenue, Pasco, Washington 99301-3706 | Phone (509) 545-3535 | Fax (509) 545-3573 | web site www.co.franklin.wa.us

From: Joe_Kelly@or.blm.gov
Sent: Thursday, January 14, 2010 1:17 PM
To: Haller, Daniel R. (ECY)
Cc: jmoreau@blm.gov; Al_Doelker@or.blm.gov; Karen_Kelleher@blm.gov; J_A_Vacca@blm.gov
Subject: Re: beaver consultation on water rights

Dan,

This is a confusing and convoluted question about issuing new downstream Columbia River water rights based upon unproven assumptions about beaver dams and pond storage in some of the upstream tributaries. here are a list of issues and questions that I think should be asked and investigated before any decisions are made upon issuing new water rights in the Columbia downstream.

1. The same # of acre feet of water will come out of each of these tributaries with or without beaver dams. That # will vary according to yearly snowpack and rainfall. The only thing the beaver dams will do is slow down the spring freshet runoff, maybe slowing down the total cfs released during the spring and spreading that over a longer release period later in the year. But that would have to be thoroughly investigated before any decisions are made. The beaver dams holding back water in the ponds may recharge the aquifer making more water available to local wells. On the other hand it will be important to study each tributary on a case by case basis to look at local domestic and irrigation water uses in each tributary to see if the dams will affect the amount of water available to local irrigators, It may extend their irrigation season.
2. Other issues to consider. what happens in a drought year when new water rights are issued downstream.
3. what happens if the beavers eat up their food supply and move on, as is often the case?. Or get trapped out. (unlikely) The dams will last for a while, but often will fill in with sediment as water overflows the dams.
4. what about dam failures in big spring runoff events? now the stored water has been released months earlier than anticipated but the legal water rights remain.
5. Will the beaver dams contribute to water cooling, or heating from a greater surface area, and longer exposure to the sun.

I'm sure this is just the tip of the iceberg in issues to consider, but these are the first ones to come to my mind.

Thanks, Joe Kelly

January 23, 2010

Derek Sandison, Director
Office of Columbia River
Department of Ecology
15 West Yakima, Suite 200
Yakima, WA 98902

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JAN 26 2010
DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

RE: Beaver and Water Storage Project

Dear Mr. Sandison

The Lands Council would like to provide further comment about our Beaver Solution and our proposal, after reviewing comments that Dan Haller sent us. We believe our project will help fisheries, farmers, ranchers, property owners, municipalities, and other water users in the Columbia Basin, and that we need to move forward in 2010. We appreciate all the feedback we have seen to date.

As you know, the Lands Council has applied to the Office of Columbia River (OCR) to create new water storage options by introducing beaver into suitable habitat in tributaries of the Columbia River. Our Ecology funded research (final study to be released in Feb 2010) indicates that an individual beaver dam has the potential to store up to 35 acre-feet of water. Our pilot project would introduce beaver families in five locations and gather information about the amount of surface and groundwater stored and timing of release. We believe this pilot study will enable us to characterize and quantify changes in surface and groundwater storage, stream discharge, and water quality as a result of beaver dam activity

A key issue is whether this re-timed water would be available for new, uninterruptible Columbia River permits, of which 1/3 would be allocated to in-stream flow and 2/3 to out-of-stream uses (e.g. new water rights). This is a complex question that likely involves permitting agencies, property owners, and land managers, as well as the dynamics of beaver dam construction and beaver population demographics. But it is an issue worth pursuing.

According to *New Water Development by Enhancing and Restoring Beaver Dam Complexes* (http://coloradoriparian.org/GreenLine/V09-2/BeaverDam.html),

> Beaver dams and structures installed for restoration divert water from the normal channel to the underground aquifer storage. Water infiltrates through the streambanks and percolates down through the soil as it flows across the flood plain. Once water is present in the aquifer, it is possible to estimate the quantity of storage and the timing of the water return to surface flows. Both can be designed into the restoration project to serve

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intended beneficial uses such as late season irrigation or uses associated with augmentation plans.

We believe that the potential for natural water storage in the upper Columbia River watershed is so great that a methodology to account for water stored by beaver dams is needed and can be developed. Predictive models for water storage have been developed and are currently used. Agencies currently predict snowpack, moisture content, and runoff, which allow reservoirs to operate efficiently. We foresee partnering with academia and Ecology to pursue this model.

Numerous studies indicate that following the introduction of beaver, streams have increased flow; and some intermittent streams become perennial or dry up later in the season. If beavers are introduced in significant numbers, the increased downstream flows at crucial times of the year could be substantial. Our study shows that several million acre-feet of water could be held in upper watersheds, and release of this water could be re-timed for later in the summer.

Historical accounts indicate that there were millions of beaver in Washington State who served the water storage function that we believe our project could start to gain back. We recognize that to scale up a large beaver restoration program would take many years, a high level of public education and cooperation, and ongoing beaver and habitat management. Beavers move and their dams change over time making it difficult to count water rights for any one site. However, we have identified many suitable areas, including public lands, where suitable vegetation does exist, and with tools such as Beaver Deceivers, pond levelers, riparian planting and fencing, we believe many property owners and managers will welcome beaver to their land.

We believe it will be cumulative water storage and change in flow regime across the upper Columbia River basin that will be predictable and count toward water storage. In time, this water would have considerable value and a system to compensate property owners could be established. Utilizing our results in the next few years, we can start to develop the model to show how beaver are enhancing water storage across the basin and help address the water rights question.

Support for our $50,000 funding proposal is critical for this project to move forward. We are available if you have any questions or thoughts.

Sincerely,

Mike Petersen, Executive Director
mpetersen@landscouncil.org
509-209-2406

CC: Mark Jones (Bonneville Power Administration), Kevin Robinette (WDFW), Senator Lisa Brown, Senator Chris Marr, Representative Timm Ormsby, Joe Kelley (BLM), Dan Haller (Ecology)

USDA United States Department of Agriculture | Forest Service | Pacific Northwest Region | 333 SW First Avenue (97204)
PO Box 3623
Portland, OR 97208-3623
503-808-2468

File Code: 2540
Date: February 4, 2010

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FEB 0 8 2010
DEPARTMENT OF ECOLOGY - CENTRAL REGIONAL OFFICE

Dan Haller
Office of Columbia River
15 W. Yakima Ave., Ste 200
Yakima, WA 98902-3452

Dear Mr. Haller:

This letter responds to your request for consultation on whether new water allocation permits can be issued from the Columbia River based on water supply developed through introduction of beaver in tributary watersheds. The Forest Service is very supportive of re-introduction as well as introduction of beavers where there is suitable habitat and food availability to support and sustain beaver populations. Historically water storage and wetland function from beaver activity was much more prevalent across the west than today. We agree that placement and monitoring of beaver communities in certain landscape settings can aid in restoration of some of the natural processes in the hydrologic cycle, such as storage of precipitation, recharge of aquifers, enhancement of late season stream flows, etc. There is also evidence that restoring and enhancing natural processes for water storage may also provide some resiliency in the face of climate change.

We do have concerns about the ability to create new or measurable water supplies that would be allocated as new water rights for a variety of reasons. Conceptually increased late summer stream flow response as a result of beaver dams is valid, but the processes of the hydrological cycle are extremely complex and difficult to measure predictably. The predictability of beaver activity and behavior at a specific site or within a watershed is also very complex. The interaction between beaver activity and hydro-geologic response adds another layer of complexity and uncertainty, adding to the doubt of successful outcome, especially when permanent out-of stream water allocation is being considered. Because of these unknowns, we do not support allocation of new water rights based on demonstration of increased water storage from beaver activity.

We support proceeding with beaver introduction to enhance water storage and wetlands, and anticipate that there will be late summer in-stream flow benefits. Augmented late summer flow will provide some assurances that water quality, in particular stream water temperature; will be improved and thereby better support fisheries and riparian dependent species. In addition late season in-stream flows will provide more certainty that water will be available for existing water rights holders who would otherwise be unable to utilize their water right in low flow years. Thank you for the opportunity to comment on this important topic of water allocation in the Columbia River. Please keep us informed of developments in the area of water allocation and enhancement. Contact Trish Carroll, Regional Water Resources Program Manager, at 503.808.2905 (tcarroll@fs.fed.us) for additional questions or information needs.

Sincerely,

for/ MARY WAGNER
Regional Forester

cc: Derek I. Sandison, Director