

## **AGENDA | Wednesday, May 24, 2011, 2:00-4:00**

Dry Creek Advisory Group

Russian River Instream Flow & Restoration Program

### **Location**

Healdsburg Community Center, Library

1557 Healdsburg Ave.

### **Contact Information**

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<b>Time</b>	<b>Agenda Item</b>
2:00	<b>Welcome, Introductions</b>
2:05	<b>Discussion with HDR: Draft Pipeline Feasibility Study</b> Discussion, Questions & Feedback
3:00	<b>Discussion with Inter-Fluve: Draft Habitat Enhancement Feasibility Study</b> Discussion, Questions & Feedback
3:55	<b>Wrap Up</b>

## **Welcome & Introductions**

Anne started the meeting by going over the agenda and handouts. The agenda included PowerPoint presentations from both HDR and Inter-Fluve summarizing progress on the Bypass Pipeline Feasibility Study and Habitat Enhancement Feasibility Study. Ample time for questions and discussion was also included in the agenda. Handouts included the meeting agenda, HDR's and Inter-Fluve's PowerPoint presentations, the executive summaries from both studies, updated information sheets on habitat enhancement overall and the Demonstration Project, and a highlight sheet summarizing both studies.

## **Discussion with HDR: Draft Pipeline Feasibility Study**

Mark Hammer from HDR gave a PowerPoint Presentation. The presentation is available for download on the Water Agency's website.

The bypass pipeline would convey a range of flows, that would allow flows in Dry Creek to remain at the levels specified in the BO. The study evaluated pipe sizes from 48" to 72" that would accommodate flows historically seen in Dry Creek during the

summer (105 cfs to 175 cfs). The study considers potential inlet and outlet structures as well as possible routes. Those individual options were screened according to several factors, including environmental and engineering constraints and costs. The screened options were then compiled into complete alternatives of inlet, route, outlet and were further evaluated.

#### **INITIAL SCREENING: INLET OPTIONS**

Four inlet options were included.

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|--|--------|
| 1. Head box at existing outfall structure          | passed |
| 2. Siphon over dam                                 | failed |
| 3. New outlet works (tunnel) through left abutment | failed |
| 4. Integrated facility (tunnel) with Corps         | passed |

The screening criteria for the inlet options were based on design/construction and operability and resulted in the elimination of the siphon and new inlet works through left abutment. The new inlet works failed due to poor soil characteristics. The siphon was eliminated because the hydraulics did not work out. The headbox and integrated facility went on to the next level of analysis.

#### **INITIAL SCREENING: PIPELINE ROUTES**

Three general routes were screened, each including several alignments:

1. Northern Route, Warm Springs Dam (WSD) to the Russian River near either Geyserville or Cloverdale
2. Central Route, WSD to the Russian River at the confluence with Dry Creek
3. Southern Route, WSD to the Agency's facilities at Mirabel/Wohler

The Northern Route alignments require significant hydraulic head (400-foot water level in Lake Sonoma) to move the water through the pipe. This hydraulic head is possible only with the integrated facility inlet. The headbox option would not work with these alignments. Both Northern alignments would require hard rock tunneling, in which the minimum diameter is 9 feet to enable extraction of material. (Microtunneling, which incorporates a smaller diameter tunnel, is not an option in these locations.) The cost of hard rock tunneling is very high and difficult to accurately predict. The Dutcher Creek Road and direct tunneling options were eliminated due to the significant amount of tunneling necessary to complete these options. Less tunneling would be required for the Canyon Road option, therefore it went on for further evaluation.

All other alignments, with the exception of the southern alignment, which was found to be technically infeasible due to concerns about its outlet, were advanced to the next level of evaluation.

## **INITIAL SCREENING: OUTLET OPTIONS**

With regard to outlets, several different designs and locations were considered.

### **Designs**

Diffusers located in the bank, in the river, and river bed were considered as well as riverbank outfalls.

### **Locations**

For the Northern Route, the Canyon Road outlet could be located either near the Geyserville Bridge (Hwy 128) or at the end of Black Road. Central Route options were located between Westside Road bridge and the Highway 101 bridge and around the confluence. Southern options were dropped from consideration.

Outlet options were screened in terms of engineering considerations and environmental (especially fish) considerations. It was agreed that any outlets on Dry Creek would require that improvements would need to be made downstream of the outlet in order to accommodate the additional flow.

## **FURTHER EVALUATION**

Several engineering and environmental criteria were considered.

The head box inlet option came out ahead of the integrated inlet due largely to uncertainty with the Corps' commitment to pursuing the project, risks of a large (14-foot-diameter) tunnel, as well as concerns about environmental impacts and costs. There were also fewer risks and environmental costs associated with the head box.

The pipeline route along Dry Creek Road was preferred for several reasons, including an existing right-of-way on the road (i.e. avoidance of private property), ease of permitting, and width of the road. In order to completely avoid private property, microtunneling would be necessary. This route is feasible when combined with the head box alternative.

Other alternative alignments were eliminated for several reasons. For instance, Westside Road is narrow, making construction difficult. Canyon Road would require expensive hard rock tunneling due to the higher elevation and would require the more expensive inlet option. Additionally, the outlet at Canyon Road would be much more difficult to construct because the streambed is less consolidated and the river meanders more in this location, so the outlet may be constructed in the correct location for current conditions, but could end up in the wrong location in the following year. Also, the flood zone (100 year) is almost up to Highway 101 in this area. There are also concerns about attracting returning salmonids with Dry Creek water into the Russian River upstream of its confluence and losing that water to diversions before it reaches the Agency's Wohler/Mirabel facilities.

The preferred outlet would be located near the Highway 101 bridge, which provides a stable location for outlet facilities.

Overall, after evaluating 21 different alternatives, about a half dozen ended up scoring similarly. However, it was decided that the preferred project includes the headbox, route down Dry Creek Road, and outlet at the Highway 101 bridge. The preferred project would cost approximately \$141 million (in today's dollars).

## Q&A

*Question:* If the integrated outfall is better for head, why wasn't it chosen? What uncertainty are you referring to?

*Response:* The Corps is looking at two options. One is a pumping station to provide only the water necessary for emergency supply at hatchery, which would cost approximately \$15 million; the other is the integrated option (tunnel) which would include excavating up to the control structure. The tunnel would be a 14-foot diameter hard rock tunnel costing approximately \$40 million to construct. They currently have the 65% design complete for the two alternatives.

*Question:* What properties would need construction if microtunneling was not pursued with the Dry Creek Road option?

*Response:* Unsure. They are not specified at this preliminary stage.

*Question:* How do you get from Dry Creek Road to a Highway 101 bridge outlet?

*Response:* Dry Creek Road to Kinley Road. There are a couple of challenging spots (natural gas tank and recycled water line in road) along Kinley but nothing that would prevent the project from going forward.

*Question:* According to the report, the easement along Dry Creek Road is 33 feet wide. How much is needed for construction in Dry Creek Road?

*Response:* The report states that a typical construction width of 33 feet is required to install a 72" pipeline. To construct in Dry Creek Road, an easement would not be required as it is in the public right-of-way. Construction in Dry Creek Road would require one full lane and off to the side of the road, in total, about 40 feet.

*Question:* Assuming an estimation of \$140 million, does that mean \$460 for every Sonoma County resident? What is the monetary impact to businesses that would result from construction activities in the area?

*Response:* The cost to businesses hasn't been calculated. It would take about 18 months, or about two summers, to construct, although construction season varies. A couple of hundred feet would be under construction at a time so the impact would be focused, rather than for the entire length of the alignment at the same time.

*Comment:* We should remember that this is Plan B. We're hoping that the habitat enhancement will work and the pipeline won't be needed.

*Question:* If there were no customers you wouldn't need it. You've got a need and you want to fill it. But are there other "Plan B's"? What about reverse osmosis or desalination?

*Response:* There aren't any other alternatives. This is just for current water supply for current water rights for Lake Sonoma water, which was the purpose of constructing the dam. This doesn't address getting any additional water. Could we reduce water demand? Yes – the Water Agency is already working on it by trying to flatten demand out. Summer demand is double winter demand. We'd like to store winter water so we can use it in the summer.

*Question:* What about Canyon Road? It's the least disruptive to the Dry Creek community. It's shorter and the cost is about 3-5% lower than the preferred alternative. It didn't score as high as the preferred alternative but it wasn't that much lower.

*Response:* The Canyon Road alternative requires working with the Corps on the Integrated Inlet. The Corps' studies are incomplete and it's very uncertain that they'd pursue a 14-foot diameter tunnel given its risks and extra cost compared to their other option. Seems like the rating was comparable to the preferred alternative.

*Question:* Why is there a hydropower cost?

*Response:* The Canyon Road option includes \$15 million for a new hydropower facility because we're obligated to provide a certain amount of power and the existing facility would be bypassed. All alternatives with integrated facility includes hydropower to replace hydropower lost by no longer using the current facility. The Canyon Road alternative can't be done without the Integrated Inlet option because there's not enough hydraulic head without it.

We're currently at 250 feet of hydraulic head after the water leaves the hydropower facility. This would require a large amount of tunneling along Canyon Road. A power generation facility could be constructed near the discharge point.

Another reason the Canyon Road option is less desirable is because the Russian River meanders more in the area where an outlet would be placed. This makes it very unreliable and there's a very real risk that the river may move away from a constructed outlet facility. Additionally, we risk attracting salmonids with Lake Sonoma water released to the Russian River above the confluence.

An outlet at the Highway 101 bridge is reliable.

*Question:* What about the pipe alignment that went along the creek?

*Response:* That was eliminated early on due to environmental and right-of-way concerns.

*Comment:* Praise for considering many alternatives.

*Question:* What happens to gravel? When will the lake silt in and need to be dredged?

*Response:* The Corps has taken cross sections across reservoir but hasn't re-visited those cross sections. This topic was discussed in a Dry Creek Advisory Group meeting a year ago. Someone from the Corps said that the lake should be OK for about 100 years.  
Discussion from January 27, 2010 DCAG meeting:

*Question:* I'm concerned about dam instability and siltation. How long will Warm Springs Dam be in use?

*Response:* Data is available in FERC documents. Mike Dillabough from USACE has info and has estimated approximately a 100-year timeline before the lake has lost 50% capacity. USACE is waiting for funding to study this.

*Question:* What about the contractors? Are they unhappy that the pipeline would be built so far in the future?

*Response:* The contractors are happy with Plan A.

## Discussion with Inter-Fluve: Draft Habitat Enhancement Feasibility Study

Mike Burke from Inter-Fluve gave a PowerPoint presentation. The presentation is available for download on the Water Agency's website. During this talk, Inter-Fluve presented information on technical efforts to date, feasibility findings, conceptual approaches, and next steps.

### STUDY PHASES

The feasibility study includes three phases. The inventory of current conditions, which included field observations and searches of existing data, was completed in 2009 and 2010. We are currently in the feasibility analysis phase and a draft report was released in April 2011. Next, based on the feasibility report, a conceptual design from the dam to the confluence will be completed this summer.

### CURRENT CONDITIONS

The inventory of current conditions in Dry Creek included information on the geomorphic, vegetative, and fisheries habitat conditions. We looked at how the creek functions given its management history and how that affects vegetation and fish habitat. Currently, regulation of Warm Springs Dam (WSD) is a major factor affecting stream

function, because it means reduced winter floods and reduced sediment input. Reduced winter flooding results in increased vegetative growth. This vegetation acts as levees to reduce meander, focus flow, and move sediment. Historically, gravel mining lowered the bed. That has slowed down now, although there are still localized places where the bed level adjusts, especially at places with rock outcrops and sills between river miles 3 and 4.

There is plenty of variation between reaches of Dry Creek. Flatwater accounts for about 47% of the length, which is devoid of rearing habitat for coho because the water is moving swiftly and there's no cover, etc.

The draft feasibility study includes quantitative data collection efforts which support Inter-Fluve's previous field observations.

### **HABITAT ENHANCEMENT FEASIBILITY STUDY**

When planning habitat enhancement, approaches range from holistic, in which the creek is given as much room as possible to create habitat on its own using natural processes, to a more managed approach, in which habitat is constructed and maintained over time. On Dry Creek, certain reaches lend themselves to different approaches. In some areas, a holistic approach will likely work while in other areas, adaptive management will be required to maintain habitat value.

Inter-Fluve split the creek into three different segments: lower (confluence to check dams), middle (check dams to Peña Creek), and upper (Peña Creek to dam). Upstream of Peña Creek, very little sediment gets introduced to Dry Creek; it's a pretty controlled environment. In this area, it would be advisable to construct habitat and manage it over time because it's unlikely to get created on its own. In lower Dry Creek, below the check dams, the situation is quite different. Large floods on the Russian River create backwater up to the check dams which deposits sediment. Constructing detailed habitats won't work over the long term in lower Dry Creek. In the middle reach, the approach would be very site specific since the conditions vary so widely. There are unregulated flows entering Dry Creek from tributaries downstream of and including Peña Creek; this provides opportunities for habitat enhancement. Overall, Inter-Fluve found about nine miles of opportunities along Dry Creek for habitat enhancement when measured based on the main channel length that links the identified opportunities.

Inter-Fluve uses a variety of "tools" to create habitat: backwater channels, side channels, riffles, large woody debris, log jams, and others. Such enhancements will be planned for areas that are undeveloped. There are no plans to remove vines or structures.

For instance, around Lambert Bridge, plans would include creating riffles, pools, and enhancing existing pools with logs. Inter-Fluve will look at concept designs at the site-specific level next. Enhancement along a reach will include a variety of different approaches and will bring some continuity of habitat so fish can make frequent pit stops.

The feasibility study is almost complete. Next, Inter-Fluve will look at conceptual designs for all of the sites identified. Sites will be ranked according to habitat potential and geomorphic risk. Willingness of landowners is another important factor when selecting the sites that will be advanced for planning enhancements.

Inter-Fluve is also working on the design of the demonstration reach. The initial study for this project is coming out soon (permitting/CEQA documentation) and the design is at the draft 60% level.

## Q&A

*Question:* What about adaptive management? How long does this habitat need to last? What if changes are needed? What about cost?

*Response:* We are working on a comprehensive adaptive management plan that will help us measure success as well as collect and use data to manage the projects more effectively over time. We are pursuing 25-year maintenance easements and expect to do quite a bit of vegetation management during that time. We'll need to maintain and monitor constructed conditions over time. The details for how to maintain these features will be outlined by Inter-Fluve. Each feature will have a unique expected life span. We'll also be able to measure effects during flood events (i.e. good or detrimental effects) then determine how to address those.

The Water Agency hopes to have the adapted management plan complete before construction of demonstration project.

*Question/Comment:* You did a nice job being open about the unknowns. It's possible that after all that work, the creek could revert back to what it is today. It's a moving target. What is success? Doing the first mile makes a lot of sense. It's a good idea to nail down the success criteria while you're doing the first mile.

*Response:* Yes, we're working on that right now.

*Question:* What happens to those fish when you're doing maintenance?

*Response:* We would avoid work during time periods that are critical to fish. There are a few things you can do when construction takes place in the active channel, including dewater the area (divert the water), rescue any stranded fish, and keep them out of the work area while construction is taking place.

*Question:* What about winter flows? Are you comfortable that you can design something that can withstand flood releases? (It was determined that winter flows reach 6,000 cfs in the winter.) Can riffles withstand those flows?

*Response:* There are well-established design approaches used for riffles and other features. For instance, with riffles, we'd upsize the materials and mix up the particle size to increase stability and may use boulders. We would need to protect banks from

“flanking,” when the flows flank around the sides of a riffle and the stresses shift onto the banks. In large flood events, there may also be some sedimentation. The work will require monitoring. Additionally, Inter-Fluve has found that when a river moves things around, it usually leaves something else behind. For example, a riffle may disappear, but there may be another riffle created elsewhere, often just downstream.

The creek is missing quiet waters; somewhere quiet, cold, and calm for juvenile coho. We have the cold water but velocities are high.

*Question:* Is there a scoring system? Does anyone have veto power?

*Response:* We are working to build consensus before constructing projects. NMFS and CDFG are involved in creating the success criteria. It should be noted that there are manuals detailing how to measure and monitor projects so we’re not starting from scratch. With that said, this project is especially challenging because it’s very large and the techniques are a little different from previously monitored CDFG projects.

*Question:* Will the public be able to see the adaptive management plan?

*Response:* We can do that.

*Comment:* It’s wise to keep calling the projects new habitat or enhancement. It’s not restoration. There’s a general feeling in valley that this is worth trying but I’d like to see success criteria.

*Response:* There will be success criteria that are specific to the type of project and its location along the stream.

*Comment:* In the first mile, you could put 12 projects in there or you could skimp and just install two projects.

*Response:* Our directive was to make the habitat in demonstration project reach as good as we can possibly make it, while respecting the constraints due to stream function and other factors.

*Question:* How has the vegetation character changed or the sedimentation changed over time?

*Response:* Inter-Fluve looked back through the hydrologic record and saw that prior to construction of WSD, the 2-year floods were at 23,000 cfs. That is way above today’s 100-year flood event. It’s a very different stream now. The overall width of the stream corridor was created by a bigger creek. So now the creek actually has more room within the historic channel corridor. That leads to more opportunities for enhancement. There are more opportunities than we initially thought; about 1.5 miles in the upper, 1.5 miles in the lower, and the rest (around six miles) is in the middle.

We should add that, in a stream that's largely intact, a flood event will cause habitat to change and that's good. This provides variability. Different portions of a creek will react to flood events in different ways. For instance, under some circumstances in early winter, Peña Creek will provide most of the flow measured at Yoakim Bridge, with just a small amount of flow coming out of the dam, almost as if Pena Creek is the dominant watershed, and upper Dry Creek is the tributary. This scenario delivers a large proportion of the sediment that is currently delivered to Dry Creek. Later in the winter, the pattern shifts back to where flows out of the dam are much larger than out of Pena Creek. In this condition, the sediment which had been previously contributed by Pena Creek is reworked and moved downstream by Dry Creek.

All in all, this is a watershed that produces a lot of water - 200,000 AF comes out each year.

*Question:* What's the schedule for the demonstration project?

*Response:* It should be constructed during the 2012 season. An initial study will be out soon. An initial study helps determine if a mitigated negative declaration or EIR is needed. We're planning for a mitigated negative declaration for the demonstration project.

*Question:* How will this be funded?

*Response:* Warm Springs Dam tax override; a line item in the property tax of all Sonoma County residents. The demonstration project should cost between \$6-8 million and we have an escrow account with \$8 million. CDFG required those funds to be ready.

*Question:* What's the overall cost?

*Response:* The cost for all six miles ranges from \$36-48 million. The U.S. Army Corps of Engineers will pay a portion of that.

*Question:* So will there be new taxes or a bond to pay for this?

*Response:* No.

*Comment:* You should let people know this. That's a key piece of information.

### **Wrap-Up**

The Water Agency will take comments and then finalize the pipeline feasibility study. That will be as far as we take the pipeline studies for the time being. In 2018, if it is determined that the habitat enhancement is not going to work, we'll revisit the pipeline project and pursue environmental impact analysis.

The Water Agency will take comments on the draft habitat enhancement feasibility study and then finalize the document. The design work for the demonstration project will also

be pursued. The final design for the demonstration project should be release between January and April 2012. The conceptual designs for the entire 14 miles will be available in draft form late summer 2011.

The deadline to send in your comments on both studies is June 15.