United States Department of the Interior

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Reply To: 7363.0051
File Name: Westmoreland Park PAL, Crystal Springs Creek, CE Section 206 Hab. Restoratn. Proj., PDX
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P.O. Box 2946
Portland, Oregon 97208-2946

This is the U.S. Fish and Wildlife Service's planning aid letter (PAL) describing the impacts to fish and wildlife resources from a proposed Section 206 Habitat Restoration Project for a reach of Crystal Springs Creek which flows through Westmoreland Park in Portland, Oregon. Information in this letter is preliminary in nature and based on information provided by the Corps of Engineers (Corps) prior to January 11, 2002. The City of Portland (City) is the local sponsor for the project. This PAL provides only a preliminary outlook with respect to mitigation for adverse impacts to fish and wildlife resources associated with the proposed Westmoreland Park/Crystal Springs Creek Restoration Project.

Both a preliminary restoration plan prepared by the Corps and a modified Habitat Evaluation Procedures (HEP) analysis of the project area by Tetra Tech, Inc. (2001) were used in developing this planning aid letter. The HEP analysis looked at baseline conditions and possible habitat improvements for salmon and neo-tropical birds, and was helpful in determining the more environmentally sound alternatives.

This PAL has been coordinated with the Oregon Department of Fish and Wildlife (ODFW), the National Marine Fisheries Service (NMFS), and several tribal councils that have historic and current interests in the lower Willamette River, and they have been given the opportunity to provide comments. The scope of this letter is general in nature and does not constitute the formal report on the project within the meaning of Section 2(b) of the Fish and Wildlife Coordination Act (48 Stat 401 as amended; 16 U.S.C. 661 et seq.).

DESCRIPTION OF THE AREA

The Willamette River Basin encompasses over 12,000 square miles of land and water lying between the crests of the Cascade Mountains to the east and the Coast Range to the west. The Basin contains over 9,000 miles of streams and over 2,000 lakes (WBTF 1969). The Willamette

River mainstem can be further divided into three reaches, i.e., the Upstream Reach, Newberg Pool Reach, and the Tidal Reach (Rickert et al. 1977, Hines et al. 1977, Rickert 1984). The proposed project is located within the Tidal Reach of the Willamette River Basin, which encompasses the area from Willamette Falls downstream to the confluence of the Willamette with the Columbia River.

Crystal Springs Creek is a low gradient spring-fed tributary to Johnson Creek which, in turn, flows into the lower Willamette River in southeast Portland, Oregon. Crystal Springs Creek originates from springs which discharge from areas near the Reed College campus, the Rhododendron Society Test Gardens, and the Eastmoreland Golf Course. These springs feed into two water bodies on the Reed College campus: Reed Lake and Crystal Springs Lake. The lakes drain into Crystal Springs Creek which flows through the golf course, passing through culverts beneath a railroad track, under SE McLoughlin Boulevard and Bybee Boulevard, and then on to the north end of Westmoreland Park which lies adjacent to a dense residential area.

For thousands of years, the primary human users of the habitats and fish and wildlife resources of the Willamette River Basin were native Americans. With European settlement came ever expanding numbers of white settlers moving west to the Pacific Ocean. Many of these settlers stopped and stayed in the Willamette River Valley and proceeded to clear land for homes, ranches, farms, and communities. The effects of land clearing and development of the river corridor have led to significant losses of river, riparian, and upland habitat. Some estimates show an 87 percent loss of the Willamette River Basin's wetland and riparian plant communities. Further, only 1 percent of the Basin's native wetland prairie and 28 percent of its bottom hardwood habitat remain (Willamette River Basin Task Force 1997). This proposed project would restore some of this lost habitat by improving flows through the creek, transporting sediment, providing instream fish habitat, and restoring wetlands and riparian vegetation.

DESCRIPTION OF THE PROJECT

Specifically, this proposed restoration project would focus on the Crystal Springs Creek watershed and on habitat restoration for a reach of the creek which flows through Westmoreland Park between Bybee Avenue and Lambert Street in Portland, Oregon. About eight acres of aquatic and riparian fish and wildlife habitat would be restored along this section of Crystal Springs Creek. Within Westmoreland Park, there are two water bodies which figure into the restoration alternatives: an existing lake (the "duck pond") on the north end of the Park and the casting pond which is located downstream of the duck pond near the center of the Park, but is not directly connected to the creek.

Major features of the proposed project include:

- Removing approximately 2,200 linear feet of concrete channel and lake walls (excavated material would be used in wetland creation)
- Excavating about 52,000 square feet of picnic area to a depth of 1 foot to create a surface for wetland development
- Placing approximately 1,000 cubic yards of cobble/gravel at strategic points along the creek to control erosion and direct public access away from wet soil areas

- Planting about 60,000 square feet of riparian and wetland vegetation to help provide habitats, control soil erosion, and reduce water temperatures
- Creating a defined channel along the east side of the duck pond to provide fish passage
- Placing large woody debris (LWD) and other cover elements for juvenile salmonids in the creek
- Modifying the casting pond so that it provides habitat benefits for salmonids

Replacement or modification of existing recreation facilities would also be considered in the Feasibility Study for the project. Westmoreland Park is used extensively by the public and any replacement facilities would be designed to accommodate recreation while, at the same time, protecting fish and wildlife habitat values. Pedestrian paths would be modified or constructed to bring the path and water together at constructed access points. Viewpoints, interpretive signage, and seating may also be provided. New picnic areas would be provided to replace the existing facilities that are planned for conversion to wetland habitat.

The above project elements have been combined into five alternative restoration plans. The No Action plan and the five alternative restoration plans provide varying amounts of fish and wildlife habitat. The elements of each alternative plan are listed below:

Alternative 1: No Action (Figure 1)

Alternative 2: City-Proposed Plan (Figure 2)

- Remove concrete bank lining
- Revegetate an approximate 10- to 25-foot wide riparian strip on each bank
- Align channel along east side of duck pond, place island berm between channel and remaining duck pond area
- Excavate wetland areas by Lambert Street and upstream end of duck pond (~ 3 acres total)
- Place LWD in channel and create gravel/cobble beaches
- Realign pedestrian trail as necessary

Alternative 3: Minimum Alternative (restore creek to suitable salmon migration corridor) (Figure 3)

- Remove concrete bank lining
- Revegetate an approximate 10- to 25-foot wide riparian strip on each bank
- Align channel along east side of duck pond, place material to fill in remainder of duck pond for wetland habitat (~8,000 square feet), vegetate with wetland species
- Replace culverts at Bybee and Tenino Streets
- Place LWD in channel
- Construct habitat overlooks
- Realign pedestrian trail as necessary

Alternative 4: Moderate Alternative (restore creek to suitable migration corridor and create wildlife habitat) (Figure 4)

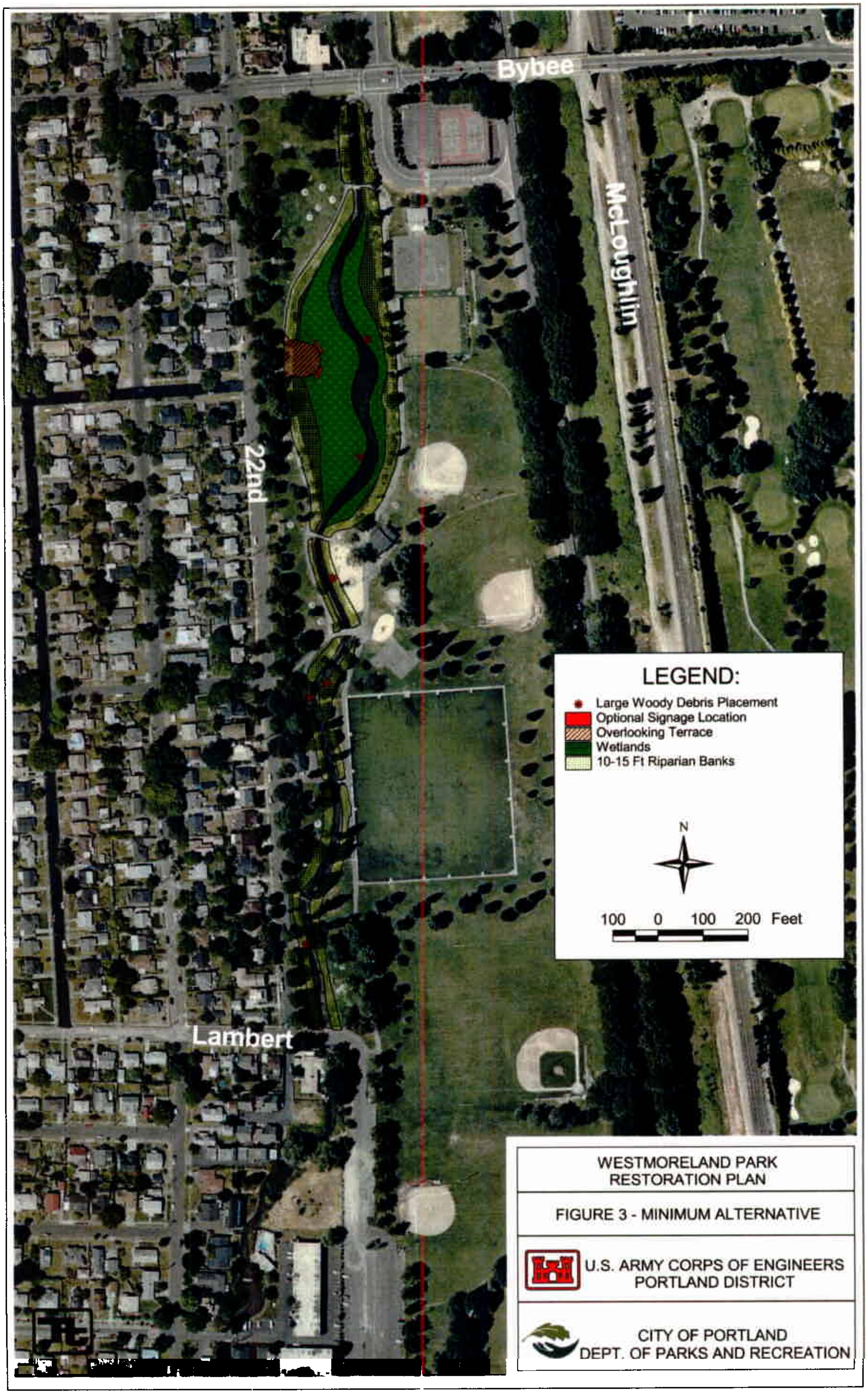
WESTMORELAND PARK
RESTORATION PLAN

FIGURE 1: NO ACTION

U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT

CITY OF PORTLAND
DEPT. OF PARKS AND RECREATION

Bybee
McLoughlin
22nd
Lambert
LEGEND:
Large Woody Debris Placement
10 Ft. Riparian Banks
Upland Vegetation
Wetlands
Sand Beach
Excavated Pools
Cobble Beach
N
100 0 100 Feet
WESTMORELAND PARK
RESTORATION PLAN
FIGURE 2 - CITY-PROPOSED PLAN
U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
CITY OF PORTLAND
DEPT. OF PARKS AND RECREATION



Bybee
McLoughlin
22nd
Lambert
LEGEND:
Large Woody Debris Placement
Optional Signage Location
Overlooking Terrace
Wetlands
10-15 Ft Riparian Banks
N
100 0 100 200 Feet
WESTMORELAND PARK
RESTORATION PLAN
FIGURE 3 - MINIMUM ALTERNATIVE
U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
CITY OF PORTLAND
DEPT. OF PARKS AND RECREATION

Bybee
McLoughlin
22nd
Lambert
LEGEND:
Optional Signage Location
Large Woody Debris Placement
Recreation Features
Wetlands
25 Ft Riparian Banks
N
100 0 100 200 Feet
WESTMORELAND PARK
RESTORATION PLAN
FIGURE 4 - MODERATE ALTERNATIVE
U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
CITY OF PORTLAND
DEPT. OF PARKS AND RECREATION

- Remove concrete bank lining
- Revegetate an approximate 25-foot wide riparian strip on each bank
- Align channel along east side of duck pond, place material to fill in remainder of duck pond for wetland habitat (~8,000 square feet), vegetate with wetland species
- Excavate wetland areas by Lambert Street and picnic area (~10,000 square feet)
- Replace culverts at Bybee and Tenino Streets
- Place LWD in channel
- Construct habitat overlooks
- Realign pedestrian trail as necessary

Alternative 5: Maximum Alternative (restore creek to good quality habitat and create maximum wildlife habitat) (Figure 5)

- Remove concrete bank lining
- Revegetate an approximate 25- to 50-foot wide riparian strip on each bank (as feasible with existing roads and buildings)
- Meander channel through center of duck pond, place material to create wetland buffer on both sides of new channel in duck pond (~8,000 square feet), vegetate with wetland and riparian species
- Remove fine sediments from channel, place clean gravel as necessary
- Excavate wetland areas at Lambert Street and picnic area (~20,000 square feet)
- Replace culverts at Bybee, Tacoma, and Tenino Streets
- Place LWD in channel
- Remove concrete from casting pond, reconfigure to half-size pond with remainder of area in wetland and riparian vegetation, sand beach on north side for public use (casting pond will still not be connected to creek, except during flood overflow)
- Construct habitat overlooks
- Realign pedestrian trail as necessary
- Provide interpretive signage for nature trail on west side of creek

Alternative 6. Preferred Alternative (Figure 6)

- Remove concrete bank lining
- Revegetate an approximate 50-foot wide riparian strip on each bank (as feasible with existing roads and buildings)
- Meander channel through center of duck pond, place material to create wetland buffer on both sides of new channel in duck pond (~8,000 square feet), vegetate with wetland and riparian species
- Remove fine sediments from channel, place clean gravel as necessary
- Excavate wetland areas at Lambert Street and picnic area (~20,000 square feet)
- Replace culverts at Umatilla and Tenino Streets
- Place LWD in channel
- Construct habitat overlooks
- Realign pedestrian trail as necessary
- Provide interpretive signage for nature trail on west side of creek


Bybee
McLoughlin
22nd
Lambert
LEGEND:
Large Woody Debris Placement
Benches
Signage
Boardwalk
Existing Trail
New Pathway
Wetlands
25-50 Ft Riparian Banks
Sand Beach
N
100 0 100 200 Feet
WESTMORELAND PARK
RESTORATION PLAN
FIGURE 5 - MAXIMUM ALTERNATIVE
U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
CITY OF PORTLAND
DEPT. OF PARKS AND RECREATION


Bybee
McLoughlin
22nd
Lambert
LEGEND:
Large Woody Debris
Benches
Signage
Boardwalk
Existing Trail
New Pathway
Wetlands
Riparian Zone
N
Scale:
1"=200'
1:2400
100 0 100 200 Feet
WESTMORELAND PARK
RESTORATION PLAN
FIGURE 6 - PREFERRED ALTERNATIVE
U.S. ARMY CORPS OF ENGINEERS
PORTLAND DISTRICT
CITY OF PORTLAND
DEPT. OF PARKS AND RECREATION

The preferred alternative provides for a 50-foot riparian buffer on each side of the creek; however, because of cost considerations, it reduces the number of culvert replacements to those at Umatilla and Tenino Streets. There has been some further investigation, however, into including the Bybee Street culvert in the preferred alternative. Another stream barrier, a carport which crosses the creek between Tenino and Umatilla Streets, is also being studied as a possible culvert construction site.

The goal in terms of restoration of stream hydrology is to remove culverts that are restricting fish passage because of high velocity flows and to provide habitat quality improvements via new, more "fish friendly" culverts, changes in creek depth and configuration, and through creation and restoration of important fish and wildlife habitats. The new culverts, channel changes, and restoration of wetland and riparian habitats would, in most cases, help to reduce flow velocities in the creek from 2.5 feet per second (fps) to 1.5 fps (Table 1). Average flows in the creek would remain at 10-12 cubic feet per second (cfs) which is adequate to pass fish through the project area.

BIOLOGICAL RESOURCES

Vegetation along Crystal Springs Creek consists primarily of manicured lawns and ornamental trees intermittently placed along the creek, the type of vegetation associated with a college campus and a public park. The streambanks of the creek as it flows through the park are lined with twelve inch high concrete sidewalls. Those sections of the creek that flow through residential areas are flanked by somewhat denser vegetation along the bankline, but no portion of the creek has what would be considered a native riparian corridor.

Crystal Springs Creek, in combination with the Reed Lake water surface system, is about 2.3 miles long. The watershed itself totals 2.8 square miles. Historically, Crystal Springs Creek supported populations of winter steelhead trout, coho salmon, and cutthroat trout (Willis et al 1960). According to the preliminary restoration plan provided by the Corps for this project, surveys conducted in 1992 by BEAK Consultants on Johnson Creek and several of its tributaries collected a juvenile chinook salmon in Johnson Creek at its confluence with Crystal Springs Creek. In the following year, several juvenile (probably fall) chinook salmon were collected in Crystal Springs Creek. In 1993, interested citizens, in cooperation with ODFW, sampled upper Johnson Creek and Crystal Springs Creek with electrofishing equipment and observed several adult coho salmon as well as several juvenile coho. Juvenile winter steelhead trout were also collected in Crystal Springs Creek in 1992. Most of the coho and steelhead juveniles were the result of outplantings by Mr. Clyde Brummel, who has been managing a hatchbox on the creek since 1981. ODFW supplies about 15,000 fertilized coho and steelhead eggs for hatchbox raising each year. Fingerlings generally remain in the system for about one year before outmigrating in the spring and fall of the following year.

The fall chinook juveniles observed in 1993 in Johnson Creek and Crystal Springs Creek were probably the progeny of naturally spawning adults, since no chinook salmon had been stocked in the watershed prior to the electrofishing surveys. However, it is unlikely that any actual spawning occurred within the project area because the substrate in this section of Crystal Springs Creek consists primarily of fine sediment, which is not conducive to successful spawning. Fall chinook enter the Willamette River and its tributaries from August to October (Tetra Tech 2001).

Culvert/Bridge Velocities for Crystal Springs (fps)

Station	Structure	Description	Existing Conditions Model: no changes — average flow (12 cfs) u/s	d/s	2-yr flow (32 cfs) u/s	d/s	100-yr flow (70 cfs) u/s	d/s	Culvert Replacements: replace Umatilla, Nehalem, Tacoma, Tenino, Bybee — average flow (12 cfs) u/s	d/s	2-yr flow (32 cfs) u/s	d/s	100-yr flow (70 cfs) u/s	d/s
9000	Culvert	C-5 at SE 28th	2.38	1.91	2.86	10.40	2.70	7.65	2.38	1.91	2.86	10.40	2.70	7.65
8600	Bridge	B-19 on golf course	0.52	0.73	0.96	1.26	0.66	0.74	0.52	0.73	0.96	1.26	0.65	0.73
8540	Bridge	B-18 on golf course	1.71	2.61	2.35	3.35	0.79	0.85	1.71	2.61	2.35	3.35	0.79	0.84
8430	Bridge	B-17 on golf course	0.65	0.75	1.13	1.13	1.26	1.19	0.65	0.75	1.12	1.12	1.23	2.03
8365	Bridge	B-16 on golf course	1.81	1.61	3.01	2.60	1.07	1.04	1.81	1.61	2.85	2.47	2.13	2.07
8180	Culvert	C-4 on golf course	0.73	0.73	0.95	1.05	1.12	0.90	0.73	0.73	1.05	1.16	1.93	1.79
7970	Bridge	B-15 on golf course	1.18	1.11	0.93	0.90	0.46	0.46	1.16	1.08	1.14	1.09	0.99	0.98
7450	Bridge	B-13 on golf course	1.33	0.40	1.71	0.60	0.40	0.38	1.31	0.40	1.97	0.69	0.86	0.65
6770	Culvert	B-12, RR	0.62	0.42	0.92	0.86	0.77	1.20	0.71	0.44	1.09	0.93	0.96	1.37
6500	Culvert	B-11 McLoughlin	0.37	0.50	0.71	0.91	0.87	1.02	0.40	0.54	0.78	1.03	1.03	1.22
6365	Bridge	B-9 and B-10	0.36	0.33	0.40	0.39	0.23	0.22	0.46	0.41	0.53	0.52	0.33	0.31
5700	Culvert	Glenwood	0.72	0.68	1.43	1.45	0.47	0.79	0.86	0.83	1.63	1.72	2.21	2.84
5540	Bridge	Firehouse Bridge	1.22	0.32	1.76	0.59	0.83	0.56	2.88	0.47	3.45	0.81	2.85	1.04
5420	Culvert	C-1 Bybee	1.30	1.10	2.71	2.42	3.15	3.22	0.58	0.48	1.14	0.98	1.71	1.54
5160	Bridge	B-7	0.23	0.16	0.42	0.30	0.21	0.18	0.36	0.24	0.57	0.40	0.57	0.43
4365	Bridge	B-6	0.41	0.27	0.36	0.32	0.14	0.15	2.10	1.33	0.83	0.57	0.34	0.34
4130	Bridge	B-5	0.63	0.82	1.02	1.31	0.29	0.31	1.35	1.63	1.48	1.97	1.30	1.50
3774	Bridge	B-4	0.60	0.47	1.06	0.82	0.45	0.38	1.07	0.87	1.43	1.11	1.48	1.14
3620	Bridge	B-3	0.68	0.41	1.07	0.63	0.32	0.27	1.13	0.83	1.59	0.92	1.11	0.76
3500	Bridge	B-2	0.47	0.36	0.82	0.61	0.26	0.23	0.78	0.56	1.12	0.86	0.86	0.61
3200	Bridge	Lambert	0.35	0.28	0.71	0.60	0.27	0.37	0.51	0.36	0.87	0.70	1.15	1.04
2400	Bridge	Miller	0.88	0.65	1.77	1.38	0.94	0.88	1.45	1.02	2.54	1.86	2.85	2.59
2150	Bridge	Nehalem	0.35	0.37	0.77	0.80	0.81	0.86	0.64	0.69	1.19	1.28	1.52	1.62
1500	Culvert	Tacoma	1.36	0.97	2.17	1.76	2.22	2.16	0.54	0.41	0.96	0.79	1.32	1.16
1250	Culvert	Tenino	1.61	1.15	2.51	2.10	2.94	3.01	0.59	0.42	1.01	0.71	1.54	1.00
1140	Culvert	Carport	1.23	2.83	2.00	5.07	0.51	0.76	1.23	2.62	2.00	5.13	0.60	0.96
950	Culvert	Umatilla	2.31	1.79	2.75	2.31	2.13	2.24	1.83	1.00	1.79	1.07	1.36	0.87

Table 1. Changes in flow velocities at bridges and culverts (with project conditions).

			channel n value changed from .043 to .02						replace 5 culverts and excavate berm					
5540	Bridge	Firehouse Bridge	1.33	0.33	1.92	0.61	0.91	0.58	3.21	0.49	3.45	0.81	2.65	1.04
5420	Culvert	C-1 Bybee	1.34	1.13	2.80	2.51	3.28	3.36	0.59	0.49	1.14	0.98	1.71	1.54
5160	Bridge	B-7	0.24	0.17	0.45	0.32	0.24	0.20	0.38	0.24	0.57	0.40	0.57	0.43
4365	Bridge	B-6	0.53	0.34	0.47	0.38	0.16	0.16	0.84	0.37	0.75	0.45	0.37	0.34
4130	Bridge	B-5	0.71	0.92	1.17	1.52	0.33	0.35	1.35	1.63	1.48	1.97	1.30	1.50
3774	Bridge	B-4	0.66	0.51	1.20	0.93	0.48	0.40	1.07	0.87	1.43	1.11	1.48	1.14
3620	Bridge	B-3	0.73	0.44	1.26	0.73	0.34	0.29	1.13	0.83	1.59	0.92	1.11	0.76
3500	Bridge	B-2	0.50	0.38	0.93	0.71	0.28	0.24	0.78	0.56	1.12	0.86	0.86	0.61
3200	Bridge	Lambert	0.36	0.28	0.76	0.63	0.28	0.50	0.51	0.36	0.87	0.70	1.15	1.04
2400	Bridge	Miller	0.90	0.65	1.90	1.42	1.24	1.12	1.45	1.02	2.54	1.86	2.85	2.59
2150	Bridge	Nehalem	0.35	0.36	0.78	0.81	0.82	0.87	0.64	0.69	1.19	1.28	1.52	1.62
1500	Culvert	Tacoma	1.42	1.00	2.24	1.81	2.23	2.17	0.54	0.41	0.96	0.79	1.32	1.16
1250	Culvert	Tenino	1.84	1.17	2.52	2.11	2.94	3.02	0.59	0.42	1.01	0.71	1.54	1.00
1140	Culvert	Carport	1.23	4.39	2.00	6.09	0.89	1.28	1.23	2.62	2.00	5.13	0.60	0.96
950	Culvert	Umatilla	2.31	2.27	2.78	2.34	2.13	2.24	1.83	1.00	1.79	1.07	1.36	0.87
									replace Umatilla and excavate berm					
5540	Bridge	Firehouse Bridge							1.22	0.32	1.76	0.59	0.98	0.61
5420	Culvert	C-1 Bybee							1.30	1.10	2.71	2.42	3.40	3.49
5160	Bridge	B-7							0.23	0.16	0.42	0.30	0.26	0.22
4365	Bridge	B-6							0.28	0.20	0.38	0.30	0.19	0.18
4130	Bridge	B-5							0.63	0.82	1.02	1.31	0.38	0.40
3774	Bridge	B-4							0.60	0.47	1.06	0.82	0.52	0.43
3620	Bridge	B-3							0.68	0.41	1.07	0.63	0.36	0.31
3500	Bridge	B-2							0.47	0.36	0.82	0.61	0.29	0.25
3200	Bridge	Lambert							0.35	0.28	0.71	0.60	0.29	0.39
2400	Bridge	Miller							0.88	0.65	1.77	1.38	1.05	0.97
2150	Bridge	Nehalem							0.35	0.37	0.77	0.80	0.84	0.89
1500	Culvert	Tacoma							1.36	0.97	2.17	1.76	2.28	2.21
1250	Culvert	Tenino							1.62	1.15	2.51	2.10	3.02	3.31
1140	Culvert	Carport							1.23	2.62	2.00	5.02	0.60	0.96
950	Culvert	Umatilla							1.33	1.10	1.56	1.34	1.58	1.31

Table 1, continued.

			replace Umatilla and Tenino, excavate berm					
5540	Bridge	Firehouse Bridge	1.22	0.32	1.76	0.59	1.37	0.75
5420	Culvert	C-1 Bybee	1.30	1.10	2.71	2.42	4.06	4.14
5160	Bridge	B-7	0.23	0.16	0.42	0.30	0.42	0.33
4365	Bridge	B-6	0.28	0.20	0.38	0.30	0.30	0.27
4130	Bridge	B-5	0.63	0.82	1.02	1.31	0.93	0.97
3774	Bridge	B-4	0.60	0.47	1.06	0.82	1.04	0.82
3620	Bridge	B-3	0.68	0.41	1.07	0.63	0.70	0.53
3500	Bridge	B-2	0.47	0.36	0.82	0.61	0.57	0.44
3200	Bridge	Lambert	0.35	0.28	0.71	0.60	0.47	0.63
2400	Bridge	Miller	0.88	0.65	1.77	1.38	1.96	1.89
2150	Bridge	Nehalem	0.35	0.37	0.77	0.80	1.18	1.26
1500	Culvert	Tacoma	1.36	0.97	2.33	1.68	2.94	2.86
1250	Culvert	Tenino	0.64	0.58	1.11	1.04	1.68	1.61
1140	Culvert	Carport	1.23	2.62	2.00	5.02	0.60	0.96
950	Culvert	Umatilla	1.33	1.10	1.56	1.34	1.58	1.31

Table 1, continued.

These fish spawn immediately beginning in early September and continuing through early October. Fry emergence occurs from January through April. Fall chinook fry and juveniles rear in backwater areas, along shallow stream banks, under instream woody debris, and in side channel areas. They seem to prefer areas with slow to moderate channel flows.

Coho salmon, which were historically present in the Johnson Creek watershed and Crystal Springs Creek, enter the Willamette River from late August through early December (Tetra Tech 2001). Coho typically utilize small creek systems for spawning and rearing, as opposed to chinook salmon which generally are main-stem spawners. Once they move into the tributary streams, coho will often hold up in deep pools for long periods of time, waiting for the right water conditions to move to upstream spawning locales. Spawning usually occurs from October through December and sometimes into January depending on stream conditions. Fry emerge from the redds in late February through April. Coho fry and juveniles spend about eighteen months rearing in freshwater, moving in schools along bank margins and under overhanging vegetation. Coho fry can often be found holding in pools, backwaters, and side channel areas. These side channel areas are often used as overwintering habitat. Narrow streams with a high percentage of bank margin habitat, woody debris, and pools rate high as preferred coho habitat.

Steelhead trout, both summer and winter runs, can be found in the Willamette River and its tributaries, although the winter steelhead is the more significant in terms of run size. Winter steelhead enter the Willamette River from mid-February through mid-May and spawn from March through May. Summer steelhead enter the river from late March through July. Juvenile steelhead typically rear in freshwater from one to two years utilizing areas with woody debris and rubble. Smolts migrate out of the natal streams from April through June. Streams with dense riparian vegetation and deep cold pools offer the best habitat elements for steelhead trout survival (Tetra Tech 2001). Steelhead are listed as threatened in the Lower Columbia River Evolutionarily Significant Unit (ESU) (which includes the area of the Willamette River below Willamette Falls) and in the Upper Willamette River ESU.

Pacific lamprey, an important tribal food and cultural resource, are also found in the lower Willamette River and its tributaries, although their populations have declined considerably in the past several years. Depending on their life history phase, adult lamprey either migrate upstream to spawn during the late spring and summer and spawn upon reaching their spawning grounds or they migrate upstream during the fall months, then overwinter, and spawn the following spring (van de Wetering 2001). Lamprey spawn in clean waters over gravel. After hatching, larval lamprey burrow into stream sediment where they remain for five years or more. Because they are filter feeders, larval lamprey depend on fairly low gradient streams that provide an abundance of organic detrital matter. After this period on the stream bottom, the lamprey undergoes smoltification and begins to move downstream to the ocean. Depending on life history phase, downstream migration may occur in the fall or spring. Crystal Springs Creek may be only minimally suitable for lamprey spawning and rearing, however, due to the proximity of the Creek to urban development, water quality issues, and lack of appropriate substrate for spawning and rearing.

Wildlife resources associated with the project area include a variety of waterfowl species. Recent surveys of the area by ODFW (Thornton 2002) show that diving ducks such as buffleheads, canvasbacks, ruddy ducks, lesser scaups, ringnecks, and mergansers are found primarily in Crystal Springs Lake in the upper watershed but there is occasional use of the "duck pond" by these same species. Puddle ducks, including mallards, American wigeons, a few Eurasian wigeons, green-winged teals, gadwalls, and shovelers, are frequent users of the pond in Westmoreland Park and may also be found in the creek. Canada geese, most of which are resident birds, use both the lake and the pond. A number of neo-tropical migrant species such as American goldfinches, house finches, ruby-crowned kinglets, swallows, and American robins migrate through the park each year. More common species such as English sparrows, starlings, and crows use the project area for nesting and rearing young. Rabbits, squirrels, gophers, and moles also inhabit the park and residential areas surrounding the creek, while beaver, nutria, and muskrat may occasionally be found along the streambanks. Crystal Springs Creek and the surrounding watershed also provide habitat for amphibians such as the Pacific chorus frog and long-toed salamander, and reptiles such as the garter snake and western painted turtle. The latter species can be found using the logs and backwater habitat of the "duck pond" (Beilke 2002). A modified Habitat Evaluation Procedures (HEP) was conducted for the proposed project site by Tetra Tech, Inc. using the yellow warbler and green-backed heron as representative species for the riparian and streamside habitats of the project, for both existing and future (with the project) conditions.

The Corps' Section 206 Habitat Restoration authority offers the Corps the opportunity to partner with the City to restore habitat for fish and wildlife in Crystal Springs Creek and to restore a more "natural" habitat condition to the Westmoreland Park site. Without this effort, the "managed" habitat conditions that have been developed in the park and along the creek would likely prevail, with more and more urban development encroaching into the watershed. This project provides a means to restore fish and wildlife habitats and values to a portion of the Crystal Springs Creek watershed by securing a dependable water flow through the system and creating a channel-wetland-riparian complex that mimics preferred habitat conditions for fish and wildlife resources, particularly salmonids and neo-tropical birds.

DISCUSSION

The HEP analysis shows that Alternative 5 provides the highest suitability index for both fish and neo-tropical birds. This relates to the overall reduction in maximum water temperature for fish because of stable flows and increased shading from riparian plantings, changes in the presence of a more favorable sediment substrate size, and favorable changes in water velocity associated with culvert removal and replacement. The widening of the riparian corridor also benefits both fish and birds, i.e., fish benefit from the shading and detrital input and birds from the enhanced shrub and canopy cover. Plantings of native riparian vegetation are expected to increase neotropical migrant use of the area by vireos, wrens, yellow warblers, and green-backed herons. Salmon also benefit from improvements in cover associated with placement of large woody debris and because of the presence of a flow-through channel and improvements in passage afforded by new, more "fish-friendly" culverts.

One area of concern, however, relates to the impact of converting the "duck pond" habitat to a channel-wetland-riparian complex and its effect on painted turtles using the pond. This shift in habitat type would most probably eliminate the (small) population of painted turtles in this section of Crystal Springs Creek (Beilke 2002). Although not federally listed, the western painted turtle is listed as a "state-sensitive-critical" species and, as such, requires some additional consideration when planning projects that impact the species or its habitat. Trapping and relocation of the painted turtles in the pond; creating additional pond habitat along Crystal Springs Creek with additional basking sites; creating habitat for painted turtles in the casting pond; or keeping some portion of the "duck pond" available for use by painted turtles are some of the possible options that could help to protect this species.

It should be noted that the main focus or goal of this project should be on restoration of properly functioning conditions within the Crystal Springs Creek watershed so that it, in turn, is a functioning subset of the Johnson Creek and Willamette River Basin ecosystems. Flows do not necessarily need to mimic pre-development flow scenarios, but should, at least, assure a more natural creek condition than occurs now. Focusing on increased habitat diversity in Crystal Springs Creek through development of a meandering channel bordered by emergent wetlands and an enhanced riparian corridor, placement of more suitable substrate materials and large woody debris, and removal of exotic species should aid in establishing properly functioning conditions within the Creek. Of the alternatives described, Alternative 5 offers the most opportunities for achieving comprehensive habitat restoration and diversity and the best chance of success in meeting the requirements of a properly functioning system. The preferred alternative (Alternative 6) does not include culvert replacement at Bybee Street and does not call for any improvements to the Westmoreland Park casting pond. However, there is a real need to look at providing continuity in terms of fish passage and access to available habitat upstream of the Bybee Street culvert. Providing for unobstructed passage at the Bybee Street culvert would assure that upstream improvements to the creek that are in place near the Eastmoreland Golf Course would continue to be available for juvenile and adult salmon use. Connecting the casting pond to the creek and creating wetlands and planting riparian vegetation in a portion of the casting pond adjacent to the stream riparian corridor would increase the amount of quality fish and wildlife habitat in the watershed by a significant amount, particularly backwater rearing habitat for juvenile salmon. Because of the benefits to the watershed, we believe the Corps and the City should give greater consideration to including the latter items in the restoration plan, perhaps on an incremental basis over a five-year period.

Monitoring of the restoration efforts is imperative if success is to be achieved. A monitoring plan should be developed by the City and reviewed by an interagency team prior to the start of any on-the-ground project improvements.

One additional concern regarding the project relates to its overall scope which, due to legal and financial constraints, is presently quite limited, focusing only on that portion of Crystal Springs Creek that abuts public property. It is the Service's understanding, however, that the proposed restoration project is part of an overall, long-term effort to restore the entire Crystal Springs Creek watershed; therefore, we would encourage the City and the Corps to continue to partner in this effort and to focus next on stream habitat restoration in the residential areas downstream of Westmoreland Park. We also encourage the City and the Corps to consider how best to integrate on-the-ground projects in Crystal Springs Creek with restoration efforts in Johnson Creek and, perhaps, the Willamette River as well.

RECOMMENDATIONS

To protect fish and wildlife resources and to help assure successful restoration efforts in Crystal Springs Creek, the Service recommends that:

1. The maximum alternative, Alternative 5, be selected as the preferred alternative. If restoring the casting pond is financially prohibitive in combination with replacement of the Bybee Street culvert, we recommend every effort be made to provide adequate passage at Bybee Street.

2. Options discussed above to protect the small population of western painted turtles in Crystal Springs Creek be given serious consideration.

3. A monitoring plan be developed by the City and reviewed and approved by an interagency team prior to project construction.

4. The restoration efforts in Westmoreland Park be viewed as one step in the overall restoration of the Crystal Springs Creek watershed. There should be no project restoration efforts done here that would be prohibitive of future efforts being undertaken downstream in Crystal Springs Creek or in the Johnson Creek watershed.

If you have any questions regarding this report, please contact Kathi Larson at 503-231-6179.

Sincerely yours,

for Kemper M. McMaster
State Supervisor

KL/kl/westmor
cc:
NMFS
ODFW, Thornton, Beilke
DEQ
Confederated Tribes of the Grand Ronde
Siletz Tribal Council
Yakama Indian Nation
Confederated Tribes of the Warm Springs

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