Quarterly Report April 1 through June 30, 2002

Previous project reports, along with other project information can be viewed on our website; [http://www.dfw.state.or.us/ODFWhtml/springfield/cougar_project.html](http://www.dfw.state.or.us/ODFWhtml/springfield/cougar_project.html)

Fish Salvage – On April 1 the USACE began to draft Cougar Reservoir from minimum pool, elevation 1532, at a rate of three feet per day. Several large pools were isolated from the main reservoir as the water receded. Drawdown was halted on May 26 at elevation 1400 due to concern about the duration and degree of turbidity in the McKenzie River below the dam.

On May 14, we attempted to salvage fish from isolated pools within the drawdown zone of the East Fork McKenzie arm. Even though the pools had been cut off from the reservoir for less than two days, they were nearly dry because water was draining through the substrate. We used a seine and our hands to capture rainbow trout, juvenile chinook, dace, cottids, whitefish, lamprey and crawfish. Our movement and seining were hampered by soft, thigh deep mud. The fish were in poor condition when released into the reservoir due to warm water temperature and length of time needed to walk across the mud flats to release fish into the reservoir.

An old quarry near Annie Creek formed an isolated pool that held water through the spring. After the mud surrounding the pool firmed, we set a gill net for 15 minutes and caught two 13-15 inch bull trout. One was released in the South Fork McKenzie and the other died shortly after being extricated from the net. We later captured a 14-inch bull trout by angling and moved it to the river. We will work with the USACE to ensure that this pool and one just above Walker Creek drain and do not trap bull trout during future drawdowns.
**Fish Health** – Because of the higher than expected levels and duration of turbidity caused by the reservoir drawdown, ODFW collected and assessed the health of wild fish from several sites in the McKenzie system. Tom Murtaugh, an ODFW fish biologist in Springfield examined fish collected on May 20 between Armitage Park and Harvest Lane. He reported that juvenile trout (4 - 6 inches) appeared healthy and looked to be in good condition. Scales were intact and not abraded with adequate slime, except one young trout had some splotching on its back. Adult rainbow trout appeared gaunt but within the range of what one might expect in the spring due to normal spawning stress. Scale condition on these larger rainbows was also good and fish seemed to have a reasonable slime coat. Fin rays were not abraded or split. Eyes were clear. Cutthroat trout appeared to be in very good condition for all size ranges (range approx. 6"-12"). Vigor and condition seemed excellent, and scales and slime looked and felt normal. Eyes were clear. Cutthroat trout in the McKenzie River typically spawn earlier in the year and had more time to recuperate. In addition, fifty-three 0+ age spring chinook were examined and all fish were in good shape and appeared vigorous. All other fish species, including largescale suckers, redside shiners, and northern pikeminnow appeared to be in good condition. Adult rainbow, adult cutthroat and 6 juvenile trout were taken to ODFW fish pathologists for examination. They reported that the fish appeared to be in reasonable condition (i.e. scales, fin rays etc.). Though some of the adult rainbow trout appeared gaunt, they were within the range of normal in the spring due to spawning stress. Stomach analysis revealed aquatic insects and other drift in most fish, with one trout containing several caddis fly cases indicating that the fish were feeding. Parasite densities were high, however the life history phase of the parasites indicated they were present prior to mid April when turbidity in the river first began to increase. For details, see attached report “Lower McKenzie River Fish Sampling Assessment”

Tony Amandi, ODFW Fish Pathologist, examined seven juvenile spring chinook, two whitefish and four rainbow trout that were caught with a trap net at the head of Cougar Reservoir on May 21. The rainbow trout and whitefish appeared healthy. The chinook had swollen gill tips that may reduce their survival. They also had opaque eyes but this is often seen in fish in trap nets and likely results from handling. Previous experience with steelhead smolts trapped at Green Peter Dam and held at South Santiam Hatchery found their eyes cleared after several days. Warm water temperatures precluded later sampling in Cougar Reservoir until the fall.

**Radio Telemetry** – Migration of bull trout from Cougar Reservoir into the South Fork McKenzie was delayed this year compared to last year. In May 2001, we captured nine adult bull trout in the South Fork McKenzie above the reservoir and implanted radio tags. In 2002, radio tagged bull trout did not begin to move out of the reservoir until the second week of June, but instead, most congregated near the head of the residual pool. On June 4 we snorkeled five pools in the South Fork above the
reservoir and observed one 16” bull trout. We do not know if the delay was caused by relatively cooler river temperatures in May 2002 or by high levels of sediment moving down the river. However, by June 26, ten radio-tagged fish had moved up the river above the Cougar Crossing Bridge and we believe adult bull trout will arrive at the spawning areas at the normal time.

![Mean daily temperature of the South Fork McKenzie above Cougar Reservoir (USGS site 14159200).](image)

**Trap Net** – A floating trap net was fished 8 nights near the head of the residual pool at Walker Creek. No bull trout were captured, but we did catch 88 rainbow trout, 440 juvenile chinook (67% naturally produced), five chinook fry, 55 whitefish, and 57 dace. We had planned to fish the net periodically through the summer but warm temperatures in the reservoir made it difficult to handle fish safely.

**Tailrace Screw Trap** – From April 17 to June 28 we fished an eight-foot rotary screw fish trap just below the old adult collection facility. The trap captured 54 naturally produced juvenile chinook (7% dead), eight hatchery produced juvenile chinook (0% dead), 1,076 chinook fry (3% dead), three adult rainbow trout (100% dead), 109 whitefish (43% dead), six sculpins, four longnose dace, 238 speckled dace, and two lamprey. We did not estimate trap efficiency but believe it was less than 5%. Juvenile chinook were generally in good condition with some descaling. Whitefish were typically in worse condition with bloody spots under scales, along the lateral line, and in the fins. The trap was moved into the Diversion Tunnel pool on June 28.

**Roaring River Screw Trap** - We captured 21 juvenile bull trout, 430 bull trout fry, 17 cutthroat trout, two rainbow trout, and two whitefish. A total of 841 bull trout fry have been captured this year. We PIT tagged and released 16 juvenile bull trout above the trap and recaptured eleven for an estimated efficiency of 69%. The trap was stopped by debris on April 10. The cone was raised from April 12-22 due to high water. The trap was stopped May 7-9 for repairs.

**Dutch Oven PIT Tag Detector** - Two juvenile bull trout PIT tagged in Roaring were detected at the Dutch Oven PIT tag detector. One was tagged on March 29 and detected at Dutch Oven on May 3 and 24. The other was tagged on May 20 and detected May 25.

**Cougar Dam Tailrace PIT Tag Detector** - The system was at least partially operational for most of the quarter. However, we were unable to accurately quantify the system’s efficiency due to technical problems. A juvenile hatchery chinook PIT tagged and released on November 5,
2001 at Dutch Oven was detected below Cougar Dam on June 15, 2002. This is the first PIT tagged fish known to have passed through the Diversion Tunnel.

**Minnow Traps** - Minnow traps were set in Roaring River and the South Fork McKenzie downstream as far as French Pete Campground. Nineteen juvenile bull trout were captured in 156 trap sets. Sixteen of the juvenile bull trout were captured in 55 trap sets in Roaring River and only three were captured in 111 trap sets in the South Fork McKenzie.

**Goals for Next Quarter:**

- Capture and radio tag sub-adult bull trout above Cougar Reservoir.
- Move the screw traps and PIT tag detectors so that we can continue to monitor fish passage through the Diversion Tunnel during construction of the new adult fish trap weir.
- Install the Vaki fish counter and a PIT tag detector in Roaring River.
- Count bull trout redds in Roaring River
- Monitor spring chinook spawning in the South Fork McKenzie River below Cougar Dam.
- Continue monitoring movements of radio tagged bull trout.
Lower McKenzie River Fish Sampling Assessment - May 20, 2002

Continued turbidity conditions in the McKenzie River, caused by the Cougar Dam Temperature Control Project, prompted ODFW to assess the health of fish populations in the lower McKenzie River. During the morning of May 20, 2002, a jet sled was used to access a five mile reach of the lower McKenzie River from Armitage Park near the I-5 crossing upstream about four miles, to an area just downstream from the Harvest Boat Landing. Five seine hauls were made at three locations in this reach. All seine sets were made in the relatively shallow slow moving water that runs laterally alongside long riffles. River flow was near 5,000 cfs at the time fish were collected. Table 1 shows numbers and species of fish collected.

Table 1. Numbers and species of fish collected and inspected in the lower McKenzie

<table>
<thead>
<tr>
<th>Location</th>
<th># Seine Sets</th>
<th>0+ chinook</th>
<th>Adult rainbow</th>
<th>Adult cutthroat</th>
<th>Juvenile trout</th>
<th>N. Pike-minnow</th>
<th>Largescale sucker</th>
<th>Redside shiner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Just upstream of the I-5 Br.</td>
<td>2</td>
<td>19</td>
<td>5</td>
<td>0</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>3.5 miles above Armitage Park</td>
<td>1</td>
<td>11</td>
<td>9</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>4 miles above Armitage Park</td>
<td>2</td>
<td>23</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>18</td>
<td>13</td>
<td>7</td>
<td>3</td>
<td>9</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

1. All chinook fry and presmolts released. One mortality occurred.

All non-salmonids and chinook fry and presmolts were released into the river at the site of capture. One chinook fry mortality occurred during the operation. Eight adult rainbow, 4 adult cutthroat, and 6 juvenile trout (sp) were retained and transferred live to the ODFW Pathology Lab in Corvallis to be analyzed for parasites, disease and general condition.

Field Observations

Observations in the field concluded that juvenile trout (4 - 6 inches) appeared healthy and looked to be in good condition, with no obvious sores or apparent outward physiological degradation. Scales were intact and not abraded, except one young trout had some splotching on its back. Scale slime seemed adequate. Adult rainbow trout appeared thin but generally vigorous for this time of year. Rainbow trout are spring spawners and gaunt condition in some was attributed to normal spawning stress within the range of what one might expect. Pathologists found some retained eggs in the cavity of the largest trout (about 14"), indicating that spawning had recently occurred. Scale condition on these larger rainbows was also considered good and fish seemed to have a reasonable slime coat. Fin rays were not abraded or split. Eyes were clear.

Cutthroat trout appeared to be in very good condition for all size ranges (range approx. 6"-12"). Vigor and condition seemed excellent and scales and slime looked and felt normal. Eyes were clear. Cutthroat trout in the McKenzie River typically spawn in late winter or early spring, usually during the months of February, March and early April. If these fish had spawned they may have had more time to recuperate from spawning duress.

In addition, fifty-three 0+ age spring chinook were captured, examined and released (Table 1). Forty-two were measured. Lengths were highly variable and ranged from 42 mm to 95 mm (fork
length). All fish were in good shape and appeared vigorous. Several of the juveniles seemed large for this time of year indicating early emergence and/or good food availability. Spring chinook fry may emerge from the gravels in the McKenzie system as early as late December, with peak downstream movements documented at Leaburg Dam to occur from January through March.

All other fish species, including largescale suckers, redside shiners, and northern pikeminnow appeared to be in good condition. One crayfish and one sculpin were also captured and released.

Pathology Lab Assessment (from phone conversation - May 21, 2002)

Eight adult rainbow, 4 adult cutthroat and 6 juvenile trout (sp) were transferred live to the ODFW Pathology Lab in Corvallis for examination. Pathologists concluded fish appeared to be in reasonable condition regarding general outward condition (i.e. scales, fin rays etc.), though some of the larger fish did appear thin. An internal inspection revealed that one of the fish had recently spawned. Stomach analysis revealed aquatic insects and other drift in most fish, with one trout containing several caddis fly cases. However, no comprehensive breakdown of insect type or number was made. This indicates that these trout were capable of feeding, at least near the time when they were collected. It is unknown if the amount of food present in the stomachs would be similar to samples taken at the same time of year at times when the river is clear.

Pathologists also found high numbers of trematodes (flukes) encysted both in the gills and kidneys of most fish inspected. Some kidney samples actually appeared "white" because of the density of flukes (Nanophyetus metacercaria). Though parasite densities were high in the gills and kidneys of these fish, pathologists considered the life history phase of the parasites present indicated these fish had become burdened with these parasites prior to mid April, a time when turbidity in the river first began to increase due to the Cougar Dam project. Pathologists also felt that parasite loads could be within the range of normal for wild trout in this area of the river, but could not make conclusions without baseline information collected at other times of the year or at times prior to increases in turbidity. To accurately assess whether elevated turbidity in the McKenzie River is directly causing an increase in parasite densities, or exacerbating an already present condition, pathologists stated that more information should be collected on resident trout populations on a seasonal basis, prior to and after the influence of increased turbidity, and in different reaches of the river. Appropriate lab tests could then be conducted. Though this approach to better understand turbidity effects on McKenzie fish populations would certainly be beneficial, it should be noted that it would take significant effort and funding to implement.

Additionally, it is also unknown if negative effects to resident trout populations and upstream migrating chinook salmon and steelhead are occurring further upstream, as turbidity levels are believed to be higher closer to the confluence with the South Fork McKenzie River. A formal water quality analysis of several areas of the river (South Fork, near the confluence of the South Fork and mainstem McKenzie River, and the lower river) could better characterize the nature and characteristics of the sediment. It should also be noted that this is a "point-in-time" assessment, and there is a possibility that sustained and elevated turbidity may impact survival of incubating eggs and newly emergent fry. Long-term effects on fish now rearing in the river and on aquatic insect production are also unknown.