

APPENDIX AD5

Spring Chinook Outplanting

Historical accounts clearly confirm the presence of several salmon species in the Walla Walla River that are now extinct. Fall Chinook, chum, coho and sockeye salmon were reported to be present in the basin (Swindell 1941). Some species such as fall Chinook and chum salmon may have come up from the Columbia River and likely only used the lower portions of the Walla Walla River for spawning. Several historical journals documented healthy populations of spring Chinook salmon in the Touchet River, Mill Creek, and the mainstem of the Walla Walla River. The last spring Chinook salmon run of any significance was reported in 1925 (Van Cleve & Ting 1960). In 1955, only 18 spring Chinook salmon were reported in the sport harvest (Oregon State Game Commission 1952-58).

In 2000 CTUIR began outplanting adult Chinook in the Walla Walla Subbasin. Adults were surplus Umatilla run “Carson” hatchery brood stock. Adults were held at the South Fork Walla Walla CTUIR fish processing facility until August, and then direct stream released to the South Fork Walla Walla and Mill Creek Rivers.

Table 1 Spring Chinook Adult Outplants in the Walla Walla Subbasin

	2000	2001	2002	2003
Females Outplanted	150	641	190	138
Adult Males Outplanted	76	418	126	171
Jacks Outplanted	33	33	13	4
Total Outplants	259	1092	329	313

CTUIR used traditional spawning ground survey methods to evaluate spawning of adult outplants. Crews walked three to four stream miles each day along established index sites. Some of the more remote sites required a full day to access and sample. Crew members walked alone along the margins of the smaller tributaries or in pairs on opposite banks of larger streams. Surveyors wore polarized glasses during the surveys. To minimize stress on pre-spawning salmonids, surveyors moved carefully and quietly through holding and spawning areas. They did not probe debris jams or throw rocks into holding pools. Poor water conditions or lack of landowner permission prevented surveys at certain times and locations, and limited the spatial coverage of the surveys.

Redds were identified and judged to be complete based on redd size, depth, location, and amount and size of rock moved. All redds were reviewed by our most experienced surveyors for consistency. Orange flagging was tied to nearby vegetation to mark redds and prevent recounting. The flagging was labeled with the date, location, species and number of males and females observed on or near redds. Crews also recorded information in data books. For each redd, surveyors recorded the stream name, location, date of first observation, sex and number of fish observed on or near the redd, carcasses sampled in the areas, and habitat type. Carcasses found during the survey were measured from the middle of the eye to the hypural plate (MEHP). Fork length was also recorded if severe caudal fin erosion had not occurred. Obvious injuries were recorded in an attempt to determine the cause of death in pre-spawning mortalities. Carcasses were cut open to determine egg retention of the females and spawning success of the males. Pre-spawning mortality was defined as death of a fish before spawning. Females with egg retention

estimated near 100 percent and males with full gonads were therefore classified as pre-spawning mortalities. Tails of sampled fish were removed at the caudal peduncle to prevent re-sampling of the carcass.

Table 2 Spring Chinook Redds (N/N%) Enumerated and Redds Per Outplanted Female in the Walla Walla River

RIVER REACH	2000	2001	2002	2003
Above Skiphorton Creek-RM 17.0+	0/0	16/4.7	0/0	0/0
Skiphorton to Target Meadow Bridge RM 17.0-14.1	5/5.0	75/22.1	7/4.8	16/13.3
Target Meadow Bridge to BLM/FS Boundary-RM 14.1-12.0	16/15.8	61/18.0	35/24.1	29/24.2
BLM/FS Boundary to Gage at Trailhead- RM 12.0-8.8	35/34.7	101/29.8	58/40.0	42/35.0
Trailhead to South Fork Adult Holding Facility-RM 8.8-5.3	38/37.6	86/25.4	45/31.0	33/27.5
Adult Holding Facility to Little Walla Walla Diversion-RM 5.3-0	7/6.9	NS	NS	NS
Total Redds	101	339	145	120
Total outplants	259	1092	329	313
Redds per Female	0.67	0.53	0.76	0.87

NS= No survey.

Spring Chinook salmon redds decreased slightly in 2003 over 2002, whereas the number of redds per female increased slightly. Figure 1 shows the relationship between total outplants and total redds in the Walla Walla Subbasin. Figure 2 and Figure 3 show the relationship between total out-plants and redds-per-female and total redds and redds-per-female respectively throughout the four years of adult out-plant evaluations. Although the R2 values are relatively high for each regression, and there are no apparent outliers in the data, additional years of observation are needed to adequately populate these models at increased (>1100 spawners) and intermediate (300-1100 spawners) out-plant densities.

Due to limitations in the data, it is unclear at this time what the spawner carrying capacity is. At some increased outplant density, increases in redds will become physically undetectable because they will overlap, and possibly become unproductive due to over-seeding of the habitat. The impacts of over-seeding are uncertain and range from deleterious, due to excessive competition for resources within the group, to beneficial, due to increased life-history, genetic, and behavioral diversity.

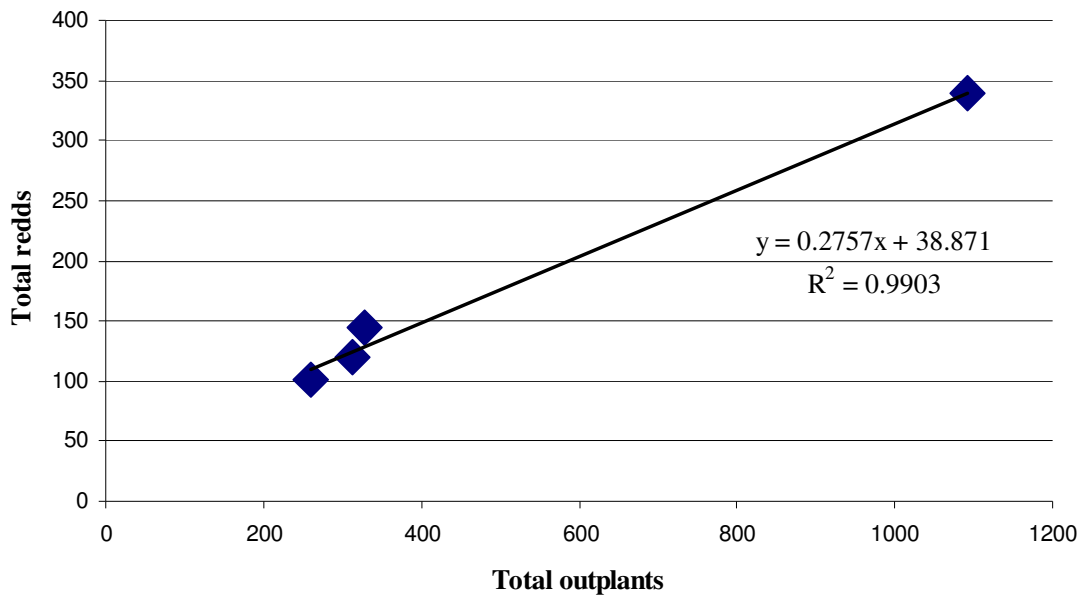


Figure 1 Total Spring Chinook Out-Plants Versus Total Redds Observed During Visual Redd Surveys

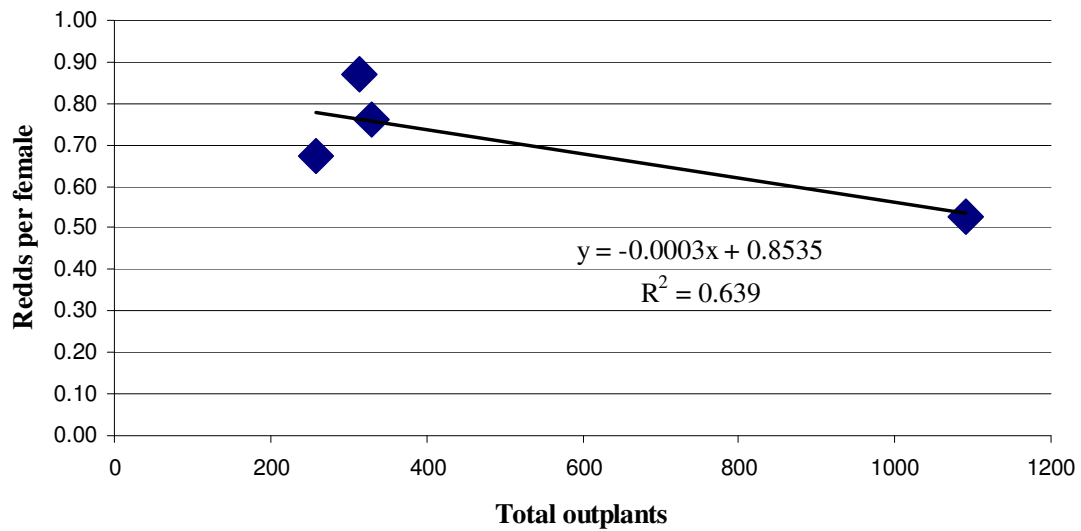


Figure 2 Total Spring Chinook Out-Plants Vs. Redds Per Female Based on Visual Redd Surveys

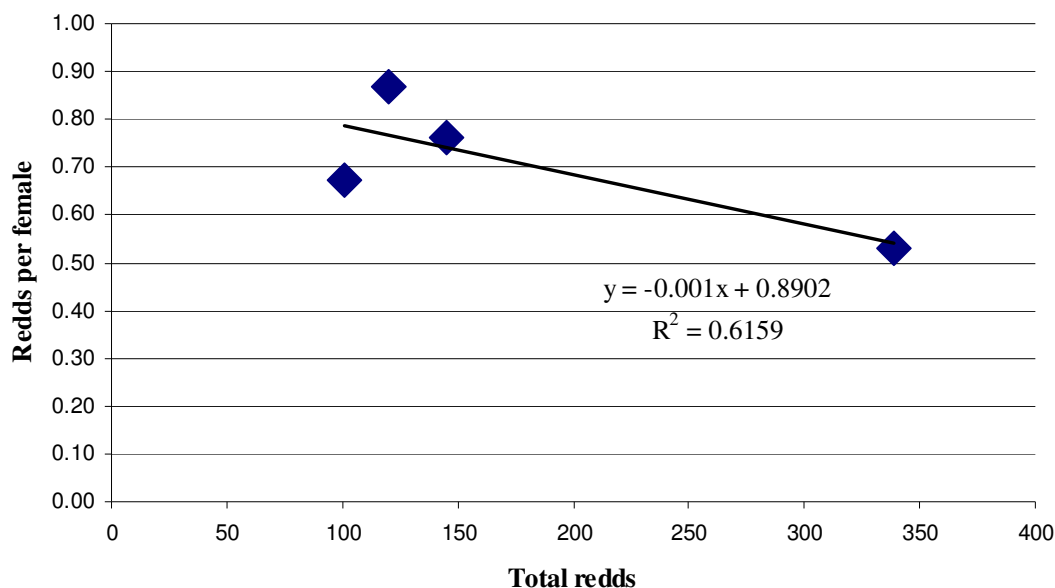


Figure 3 Total Spring Chinook Redds Versus Redds Per Female in the Walla Walla Subbasin

In 2004, four-year-old naturally reared spring Chinook produced from the adult outplanting program returned to the Walla Walla River. A number of PIT-tagged spring Chinook juveniles were detected as returning adults on the Columbia mainstem, confirming that the recent returns of over 300 spawners were most likely the product of the CTUIR sponsored outplanting program. A total of 162 redds were detected during spring Chinook spawning surveys in the Walla Walla, and only one pre-spawn mortality was observed. Based on Figure 1, this translates to approximately 439 spawners in the subbasin, including 233 Umatilla returns outplanted this year. These values suggest approximately 203 naturally spawned four-year olds returned and spawned in the Walla Walla watershed. An additional 57 spring Chinook redds were observed in the Mill Creek watershed with no pre-spawn mortalities. Redds per spawner expansions are not available for the Mill Creek watershed, but an expansion of at least one female per redd presents a reasonable minimum estimate of escapement. The success of these outplanting activities will need to be studied further when five and six year old spawners are accounted for.

Although the opportunistic spring Chinook outplanting program has shown excellent results based on this year's adult returns, it should be noted that there have been reports of a few stray spring Chinook annually reaching suitable spawning habitat over the last decade. However, the results of this preliminary reintroduction will help guide future actions and planning, including the development of a Walla Walla Spring Chinook Hatchery Master Plan.