

APPENDIX C

HARVEST RATES

In Section 5.0, NOAA Fisheries analyzes the effects of past, present, and certain future human factors within the action area (including designated critical habitat) to which the effects of the proposed action will be added. This includes the continuing effects of past and ongoing harvest rates, the latter as authorized by completed opinions. The following sections describe harvest rates for listed Columbia basin salmon and steelhead ESUs within the action area (i.e., the mainstem Columbia River).

C.1 SR SPRING/SUMMER CHINOOK SALMON

In response to initial declines in returns, in-river harvests of both spring and summer chinook were restricted beginning in the early 1970s. Fishery impacts were further reduced following ESA listing in 1991 by lower harvest rates from 1991-1999. In response to the large increase in returns of spring-run chinook, additional harvest was allowed, beginning in 2000. The current management agreement among the *U.S. v. Oregon* parties provides for higher impacts as run size increases but also calls for reductions if and when runs drop back down below prescribed thresholds.

Expected harvest rates in mainstem fisheries range up to 2% for the non-Indian and between 5 and 15% in the Treaty Indian fisheries. These are covered by the 2001 Interim Agreement on winter, spring, and summer season fisheries and are considered in the associated biological opinion. The opinion will apply indefinitely as long as fisheries are managed consistent with the assumed total impact limits, although management scenarios considered in the current *U.S. v. Oregon* negotiations would result in large enough changes for these ESUs that NOAA Fisheries would write a new biological opinion.

C.2 SR FALL CHINOOK SALMON

Harvest impacts on SR fall chinook declined after ESA listing and have remained relatively constant in recent years. In-river gillnet and sport fisheries are “shaped” in time and space to maximize the catch of harvestable hatchery and natural (Hanford Reach) stocks, while minimizing impacts on the intermingled SR fall chinook.

For the last several years, mainstem fisheries have been managed with a 31-percent harvest rate limit. This represents a 30% reduction in the harvest rate during the 1988-1993 base period. The actual harvest rate has ranged between 21 and 31% over the last five years. There have been no additional terminal-area fisheries directed at or significantly affecting SR fall chinook. NOAA Fisheries has consulted with the Bureau of Indian Affairs (BIA), USFWS, and NOAA Fisheries on fall-season mainstem fisheries each year for the last several years. There are currently no exemptions from take prohibitions for future fisheries in the mainstem Columbia River.

C.3 UCR SPRING CHINOOK SALMON

There are no specific estimates of historical harvest impacts on UCR spring chinook runs. Assuming that these fish were equally available to mainstem commercial fisheries as were runs to other areas of the Snake and Columbia rivers, harvest rates in the lower mainstem Columbia commercial fisheries were probably on the order of 20 to 40% of the in-river run. Harvest rates were sharply curtailed beginning in 1980 and were again reduced after the listing of Snake River spring/summer chinook in the early 1990s. Sport fishery impacts were also reduced. Harvest rates are currently reduced even further if the average return drops below a predefined level, with increases allowed at higher run sizes.

Current mainstem impacts and harvest provisions for UCR spring chinook are the same as those for SR spring chinook (Section C.1).

C.4 UWR CHINOOK SALMON

The average harvest rate in the freshwater fishery (including the mainstem Columbia, Willamette, and North and South Santiam, McKenzie, and Middle Fork Willamette rivers) was approximately 36 to 40% during 1970 through 2001, ranging as high as 52%.

Under ODFW's Fisheries Management and Evaluation Plan (FMEP), freshwater anglers can retain only fin-clipped fish¹ and the fishery is managed to keep the handling mortality rate at or below 15% and the average fishery rate at 10 to 11% (and probably less than 8% for the McKenzie and Middle Fork Willamette stocks; ODFW 2001). NOAA Fisheries approved the FMEP on February 9, 2001, under the ESA Section 4(d) rule (65 FR 42422). The FMEP is intended to remain in effect indefinitely, but ODFW will review the status of the fishery every five years and harvest rates could change if needed to ensure that the objectives of the FMEP are achieved.

C.5 LCR CHINOOK SALMON

The LCR chinook salmon ESU includes three adult run types: spring, tule, and bright.

The average harvest rate on spring-run chinook in the freshwater fishery (including the mainstem Columbia River) was approximately 36 to 40% during 1970 through 2001, ranging as high as 52%. Fisheries affecting these spring-run populations in the mainstem Columbia River are described in the 2001 Interim Agreement on winter, spring, and summer season fisheries and considered in the associated biological opinion. The biological opinion will apply indefinitely so long as fisheries are managed consistent with the assumed total impact limits, although management scenarios considered in the current *U.S. V Oregon* negotiations would result in

¹ ODFW now externally marks all hatchery-reared fish with an adipose fin clip, which distinguishes them from wild fish. Marking will allow fisheries to take hatchery fish while releasing wild fish and will allow removal of hatchery fish straying into wild production areas (ODFW 2001 = FMEP). The expanded hatchery fish-marking program was phased in beginning with the 1996 broods in the North Santiam and McKenzie subbasins (1997 broods in the South Santiam and Middle Fork subbasins) (Kruzic 2003).

large enough changes for these ESUs that NOAA Fisheries would write a new biological opinion.

The tule and bright components of the LCR chinook salmon ESU are impacted in fall season fisheries. As described above for SR fall chinook (Section C.2), NOAA Fisheries has consulted with BIA, USFWS, and NOAA Fisheries on fall season mainstem fisheries each year for the last several years. There are currently no exemptions from take prohibitions for future fisheries in the mainstem Columbia River

Fisheries affecting these populations in the tributaries are described in a recent FMEP and considered through an associated 4(d) determination which applies indefinitely. Harvest rates differ between tule and bright components of the ESU:

- In recent years, the total exploitation rate on Coweeman River chinook (the indicator stock for tule populations) for all ocean and inriver fisheries has been limited to 49%, but most of the impacts occur in the ocean. Based on the range of observed or anticipated harvest rates over the last 5 years, it is reasonable to expect that harvest impacts from future inriver mainstem and tributary fisheries for all early-run (tule) fall chinook populations will range between 10 and 15%. These impacts will occur primarily in the mainstem fisheries.
- Lewis River fall chinook, used as an indicator for the bright populations, have routinely exceeded the escapement goal of 5,700 by a wide margin, in part because of constraints on fisheries for other stocks. As a result, recent consultations have included no specific harvest constraints for the bright stocks. Based on the range of observed or anticipated harvest rates over the last 5 years, it is reasonable to expect that harvest rates from future inriver mainstem and tributary fisheries for all LCR bright populations will range between 5% and 16%. These impacts will occur primarily in the mainstem fisheries.

C.6 SR STEELHEAD

There are two adult life-history types within the SR steelhead ESU: A-run and B-run steelhead. Because they differ in run timing, maturity rates, and size, they are subject to different harvest impacts.

Based on recent observations, harvest rates in the mainstem Columbia River for A-run SR steelhead are expected to range up to 3.4%. B-run SR steelhead have been subject to a 17% harvest rate limit in recent biological opinions. However, actual harvest rates in recent years have generally been less than the maximum allowed and it is reasonable to expect that harvest rates on SR B-run steelhead in mainstem fisheries will range from 10% to 17%.²

² It is difficult to characterize the range of expected harvest rates for steelhead populations and ESUs. These ESUs can include both winter- and summer-run populations, and the summer run can include both A-run and B-run life history types. Because of this complication, there is a great deal of uncertainty in NOAA Fisheries' assignment of steelhead caught in mixed stock fisheries to particular population or ESUs.

Some of the harvest impacts to SR A-run steelhead from mainstem fisheries occur during the spring and summer seasons and were considered during the Section 7 review of the 2001 Agreement on winter, spring, and summer season fisheries. The biological opinion will apply indefinitely so long as fisheries are managed consistent with the assumed total impact limits, although management scenarios considered in the recent *U.S. v. Oregon* negotiations would result in large enough changes for these ESUs that NOAA Fisheries would probably write a new biological opinion. Some of the harvest impacts on SR A-run steelhead and all of the impact on SR B-run steelhead fall in fall season fisheries. NOAA Fisheries has consulted with BIA, USFWS, and itself on fall season mainstem fisheries each year for the last several years. There are currently no exemptions from take prohibitions for future fall fisheries in the mainstem Columbia River.

C.7 UCR STEELHEAD

UCR steelhead are A-run so harvest rates and agreements described above (Section C.6) for A-run SR steelhead also apply here. Future mainstem harvest rates on natural-origin UCR steelhead are expected to range up to 3.8%.

C.8 MCR STEELHEAD

The MCR steelhead ESU is comprised primarily of A-run summer populations, but there are also two or three winter-run populations in the ESU. In recent years, non-Indian winter and spring season mainstem fisheries have been subject to a 2% harvest rate limit on winter steelhead. Because of their timing and location, additional impacts to winter-run populations from the treaty Indian fisheries above Bonneville Dam are negligible (less than 2%). Future mainstem harvest rates on natural-origin summer steelhead are expected to range up to 3.4%.

Some of the harvest impacts to MCR A-run steelhead and all of the impacts to winter steelhead populations from mainstem fisheries occur during the winter, spring and summer seasons and were considered during the Section 7 review of the 2001 Agreement on winter, spring, and summer season fisheries. The opinion will apply indefinitely so long as fisheries are managed consistent with the assumed total impact limits, although management scenarios considered in the current *U.S. v. Oregon* negotiations would result in large enough changes for these ESUs that NOAA Fisheries would likely write a new biological opinion. Some of the harvest impacts on MCR A-run steelhead occur in fall season mainstem fisheries, for which NOAA Fisheries has consulted with BIA, USFWS, and itself each year for the last several years. There currently are no exemptions from take prohibitions for future fall fisheries in the mainstem Columbia River.

C.9 UWR STEELHEAD

The UWR steelhead ESU contains only winter-run populations. In recent years, non-Indian mainstem winter and spring season fisheries have been subject to a 2% harvest rate limit on winter steelhead. Because of the timing and location of treaty Indian fisheries, impacts to winter run populations are probably less than 2%.

All of the impacts to winter steelhead populations from mainstem fisheries occur during the winter, spring, and summer seasons and were considered during the Section 7 review of the 2001 Agreement on winter, spring, and summer season fisheries. The biological opinion will apply indefinitely so long as fisheries are managed consistent with the assumed total impact limits, although management scenarios considered in the current *U.S. v. Oregon* negotiations would result in large enough changes for these ESUs that NOAA Fisheries would probably write a new biological opinion.

Before 1992, the estimated harvest rate above Willamette Falls was approximately 21% (ODFW 2001). In response to poor returns, ODFW prohibited retention of this species throughout the Willamette basin and fishery impact rates decreased to about 2%. Under ODFW's (2001) Fisheries Management and Evaluation Plan (FMEP), catch and release fisheries are still allowed in the Willamette and North Santiam rivers. However, ODFW ended its winter steelhead hatchery program in 1998, and with no fish to keep, angler participation decreased and overall impacts from incidental take fell to approximately 1% (ODFW 2001).

C.10 LCR STEELHEAD

The LCR steelhead ESU includes both A-run summer and winter populations. In recent years, non-Indian winter and spring season fisheries have been subject to a 2% harvest rate limit on winter steelhead. Because of their timing and location, impacts to winter run populations from the treaty Indian fisheries above Bonneville Dam are probably less than 2%. Future mainstem harvest rates on natural-origin summer steelhead are expected to range up to about 2%.

C.11 CR CHUM SALMON

LCR chum salmon are impacted in fall season fisheries, for which NOAA Fisheries has consulted with BIA, USFWS, and itself each year for the last several years. There currently are no exemptions from take prohibitions for future fall fisheries in the mainstem Columbia River. Fisheries affecting these stocks in tributary areas are described in a recent FMEP and considered through an associated 4(d) determination which will apply indefinitely.

In recent biological opinions, the harvest rate on CR chum in mainstem fisheries has been limited to a maximum of 5%. The expected harvest rate is < 5%, but it is reasonable to expect that harvest rates from future mainstem fisheries will fall within the range of 1 to 5%.

C.12 SR SOCKEYE SALMON

SR sockeye salmon are caught in spring and summer season fisheries in the mainstem Columbia River. Allowable harvest rates have been limited to 8% in recent years, but actual harvest rates have ranged between 5 and 15% over the last five years. These fisheries are described in the 2001 Interim Agreement on winter, spring, and summer season fisheries and considered in the associated biological opinion. The biological opinion will apply indefinitely so long as fisheries are managed consistent with the assumed total impact limits, although management scenarios considered in the current *U.S. v. Oregon* negotiations would result in large enough changes for these ESUs that NOAA Fisheries would write a new biological opinion.

C.13 LCR COHO SALMON

LCR coho are harvested primarily in commercial and recreational fisheries below Bonneville Dam where the combined (hatchery- and natural-origin) harvest rate has ranged from 2 to 9% over the last five years. Early-run populations tend to be subject to higher harvest rates than late-run populations. Based on these observations, it is reasonable to expect that harvest rates for future inriver fisheries for LCR coho will be slightly higher than 6%.

LCR coho were first proposed for listing in June 2004. Because LCR coho were not previously listed, there is no prior or exemption for incidental take through the Section 7, 10, or 4(d) review process.

C.14 LITERATURE CITED

ODFW (Oregon Department of Fish and Wildlife). 2001. Upper Willamette River spring chinook in freshwater fisheries of the Willamette basin and lower Columbia River.