

## SUMMARY

### THE 1997 WATER YEAR IN REVIEW

Water year 1997 proved to be an unusually wet time in the Pacific Northwest. At the end of the second month all 27 primary sub-basins had normal or greater than normal seasonal precipitation, a status that remained throughout the year. The Upper John Day sub-basin was the driest with 115% of normal rainfall and Central Washington was the wettest with 152%. Of the 324 sub-basin-months of precipitation 43 sub-basin-months, or 13%, had less than 75% of normal rainfall, while 54% had more than 125% of normal rainfall, and 12% had more than 200% of normal, with the maximum monthly precipitation of 332% of normal observed in the Clearwater basin of central Idaho.

The Columbia Basin average snowpack was significantly greater than observed in the last 10 years. The April 1 snowpack was 137% of normal at the beginning of the snowmelt season. Washington state generally had the greatest snowpack with the Yakima basin peaking at 215% of normal. Most of the snowpacks melted at a moderate rate and produce no over bank flows.

The streamflows produced by the heavy rains and abundant snowpacks produced some new record runoff volumes, but few new instantaneous peak flows. The new records were associated with the storms and floods of November, January, February, and March plus the wet summer months of August and September.

Three winter and one summer flood events occurred this year. The first winter flood was in November and resulted in a new record peak stage on Johnson Creek near Milwaukie although much of northwestern Oregon was inundated by this short but intense storm. The second event occurred after New Years Day, effecting northern Oregon, southern Washington, and central Idaho. Although flooding was common over much of the region west of the Cascades new peak flow records were set in the Weiser Basin in central Idaho and Hangman Creek near Spokane, Washington. The March event centered mainly in southwestern Washington and set new peak flow records on the Naselle, Satsop, Skokomish, and Cedar rivers. The affects of this storm were also felt near Spokane where the Little Spokane River broke its previous peak flood stage by 1.5 ft.

The well above normal basin-wide snowpacks presented a potential for major flooding in the Columbia Basin, if spring and summer temperatures were to be above normal for an extended period. However, temperatures remained cool for the most part so the snowmelt was orderly and extended, presenting a long runoff

with few significant flood peaks. The exception was in the upper Snake Basin where a brief hot spell in June produced flooding from the Idaho-Wyoming border to central Idaho.

Good runoff volume forecasting proved to be a benefit in the reservoir operation. Most flood control reservoirs were effectively drafted to store the impending runoff. The observed January-July runoff volume was 159.0 maf, 150% of normal, exceeding the record years of 1972 and 1974.

The operation of flood control reservoirs was as expected for the volume of runoff. From April 7 through August 31 storage in Grand Coulee, Libby, Hungry Horse, and Dworshak was used to augment flows at McNary and Lower Granite, in accordance with National Marine Fisheries Service's Biological Opinion for meeting target flows for salmon out-migration. Libby flow augmentation was also made for sturgeon spawning in the Kootenai River near Bonners Ferry, Idaho. Albeni Falls is in a three year study of an higher minimum winter pool elevation to evaluate this operations effects on resident fish spawning. Dworshak drawdown began in July to get to the reservoir surface down to the 1500-foot level for grouting of cracks in the structure.

The high volume of runoff, together with lower than expected power demands, due to warmer temperatures in the southwest, provided more water to be spilled in addition to that requested by the fisheries agencies to maintain an in-river migration of juvenile salmon from their spawning areas to the ocean. Total dissolved gas values exceeded 120% for up to 68 days on the lower Snake River and for 71 days on the lower Columbia River. Peak TDG levels were in excess of 130%.

This year's hatchery releases were 10 million less than normal and 13 million less than last year. Juveniles collected were 19% greater than in 1996 but due to the BiOp 131% more were returned to the river for instream migration. Total fish transported this year was approximately the same at 1996 and 60% of the 1995.

Most returning adust salmon species showed increases over the previous year's counts, with only fall chinook and steelhead counts were lower at Ice Harbor and McNary. Counts of returning spring chinook doubled from 1996 at Bonneville, tripled their return at McNary, and increased by five-fold at Ice Harbor while coho and sockeye both increased at Ice Harbor.