

# COLUMBIA RIVER PROGRAM

## 2011 WATER SUPPLY & DEMAND FORECAST *DEFINING DRY-NORMAL-WET YEARS*

PAG Meeting

November 12, 2009

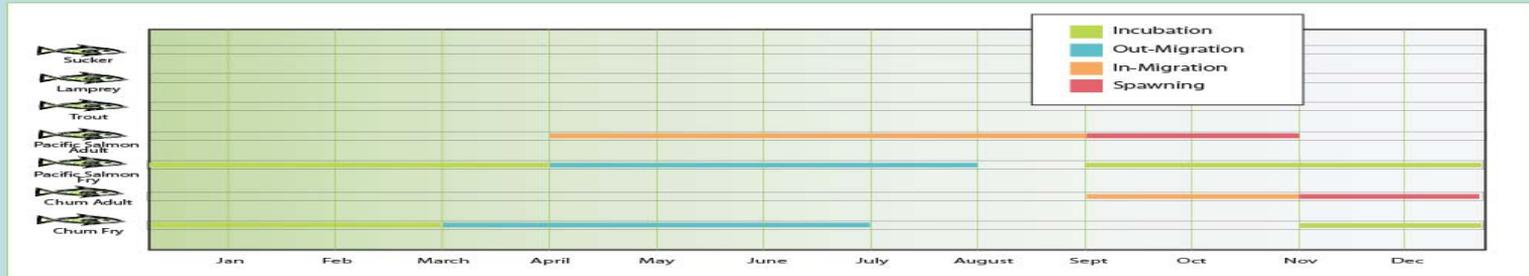
# BACKGROUND

**RCW 90.90.040(3):** “The department of ecology shall complete the first Columbia river long-term water supply and demand forecast by November 15, 2006, and shall update the report every five years thereafter.”

Data

Drought Risk 1:26

Instream Flow (WAC, SWSL, BiOp, Date)



**Instream Demand**  
 Dry = 570 acre-feet  
 Avg = 300 acre-feet  
 Wet = 90 acre-feet

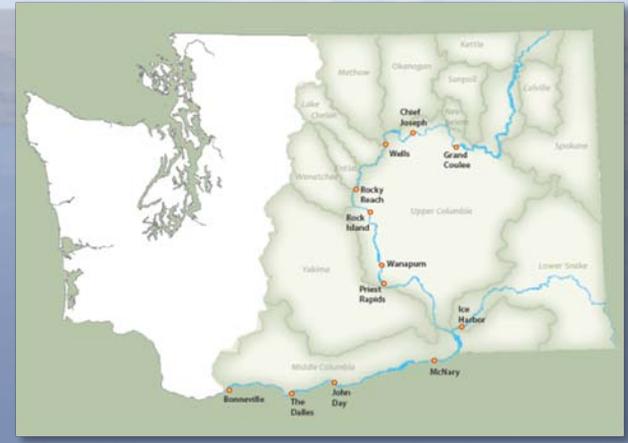
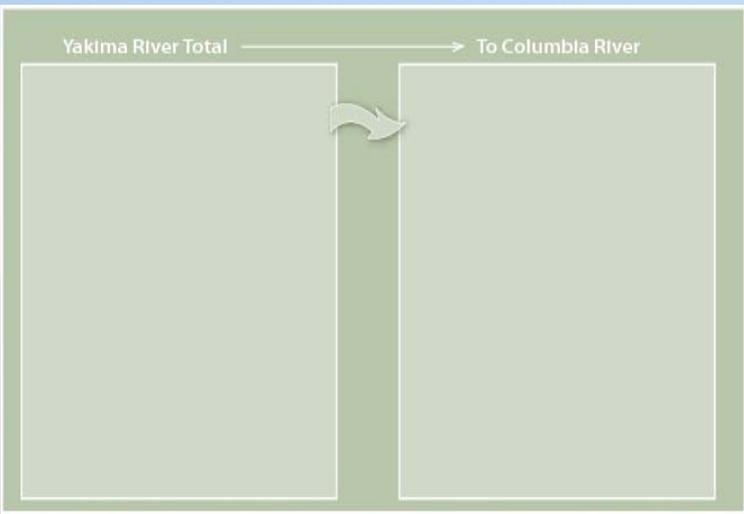
To be Completed for Tributaries and Columbia Mainstem



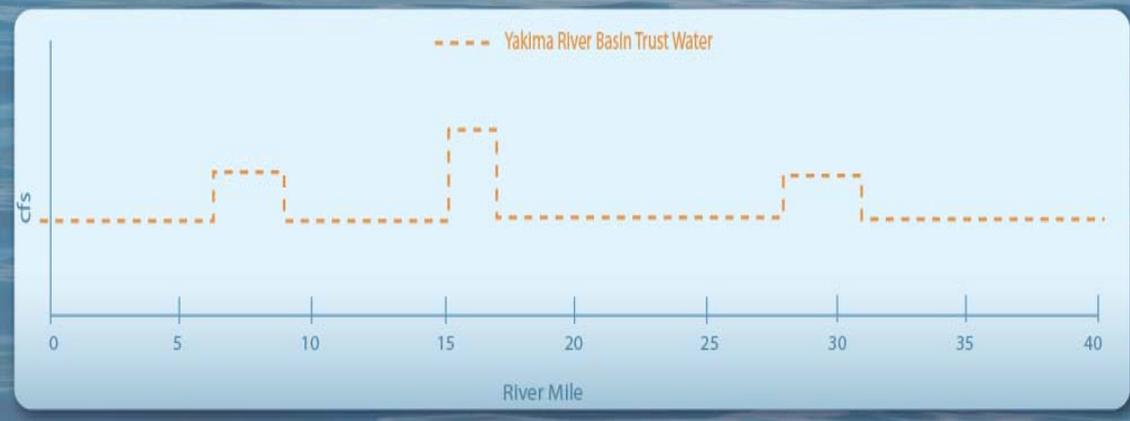
— Instream Flow Target  
 — Wet  
 — Average (Instream Flow WAC)  
 — Dry

1 cfs @ 30 days = 60 ac-ft

# Supply Side – Tributaries (Tier 2)



## Yakima River Basin





# Types of Drought

***Meteorological drought:*** Less precipitation than normal

***Agricultural drought:*** Lack of soil moisture to meet crop needs

***Hydrological drought:*** Lack of surface/subsurface water supplies

***Socioeconomic drought:*** Lack of water affects people

# Defining Drought

*A lack of "precipitation over an extended period of time, resulting in water shortage for some activity, group or environmental sector "*

*National Drought Mitigation Center*



**Water Supply Forecast  
@ Dalles**  
2001=49 MAF  
2003=65.3 MAF  
2005=60.8 MAF



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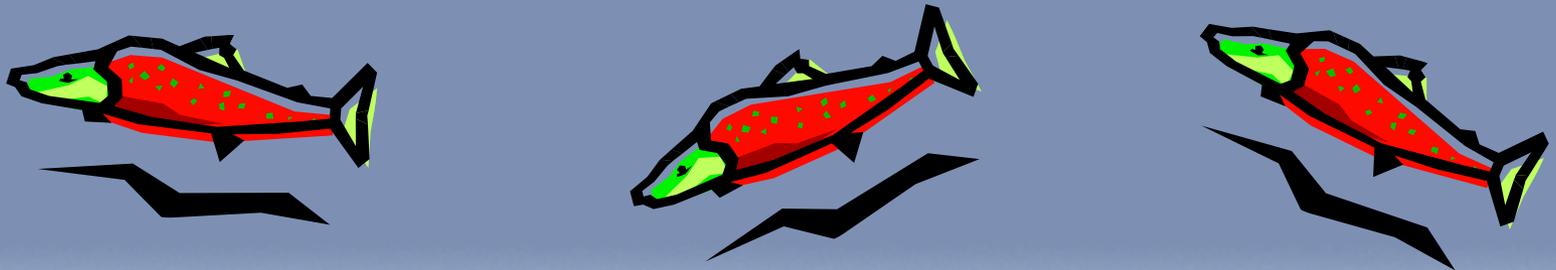
# Washington's Drought Definition

WAC 173-166-030(2)

- **Less than seventy-five percent of normal water supply as the result of natural conditions**  
*and*
- **Undue hardship to water users within that area.**

# Colville Agreement

*“... in the driest 20% of water years, the state acknowledges that the fisheries flow water will be released during April-June”*



# Yakima Basin

**Drought:** Parker Streamflow is 75% below average  
**Wet:** Parker Streamflow is 125% above average

*USDA Natural Resources Conservation Service*

**Pro-Rationing:** Compare Demand to TWSA

*Bureau of Reclamation*

**Drought:** Compare the current situation to the historical average, often based on a 30-year period of record. *National Drought Mitigation Center*

Tributary	USGS Gage No	Gage Name	Drainage Area (sq. mi)	Mean Annual Flow (cfs)	Historical Daily Data
Pend Oreille River	12398600	Pend Oreille River at International Boundary	25,200	26,372	12/01/1962–06/30/2007
Kettle River	12404500	Kettle River near Laurier, WA	3,800	2,928	09/01/1929–07/31/2007
Colville River (2)	12409000	Colville River at Kettle Falls, WA	1,007	306	11/01/1922–07/31/2007

**Dry Water Year:** Lowest 20<sup>th</sup> percentile years of averages of period of record using the May final water supply forecast for the April to August period as measured at The Dalles

*The National Weather Service's Northwest River Forecast Center*

# Wenatchee River Flow Budget

Flow budget based on an example 30 year period of record using 1 standard deviation to define wet and dry years. If a different confidence interval is used (e.g. 90/10, 95/5) it will change the number of dry and wet years in the period of

