

Effects of West-Coast Fisheries on the Abundance of Mature Age Four and Five Chinook in the Salish Sea



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More FRAM.....



More FRAM...



**.... but without all the funny
business**

What Was Previously Done



- FRAM based analysis by Larrie Lavoy : “ Which fisheries affect prey abundance and to what extent?”
- Estimated percent reduction in Chinook food energy available to SRKW from:
 - All fisheries
 - U.S. fisheries
 - Puget Sound fisheries
 - Percent reduction estimated from paired runs and comparison of kilocalories with fisheries open and kilocalories with fisheries closed.

How Does this Analysis Differ



- Only examines mature 4 and 5 year old Chinook returning to spawn in inside waters
- No conversion to kilocalories
- No use of size-selectivity function
- No need to determine spatial distribution of Chinook in inland versus coastal waters
- Examines effect of fisheries on inside stocks with a special emphasis on Fraser stocks

Which Fisheries Counted Towards a Reduction in Abundance



- Marine area fisheries only.
- All salmon fisheries represented in the FRAM model. Southeast Alaska to California
- Nearly all PS marine area fisheries were counted except for a few subareas where SRKWs have not been observed (Area 8D, 10E, 12, most of Area 13).
- PS marine terminal fishery catches were discounted by the percentage of years with sightings within fishery subareas (discounting ranges from 50% to 89%).

Which Stocks Were Included in the Evaluation

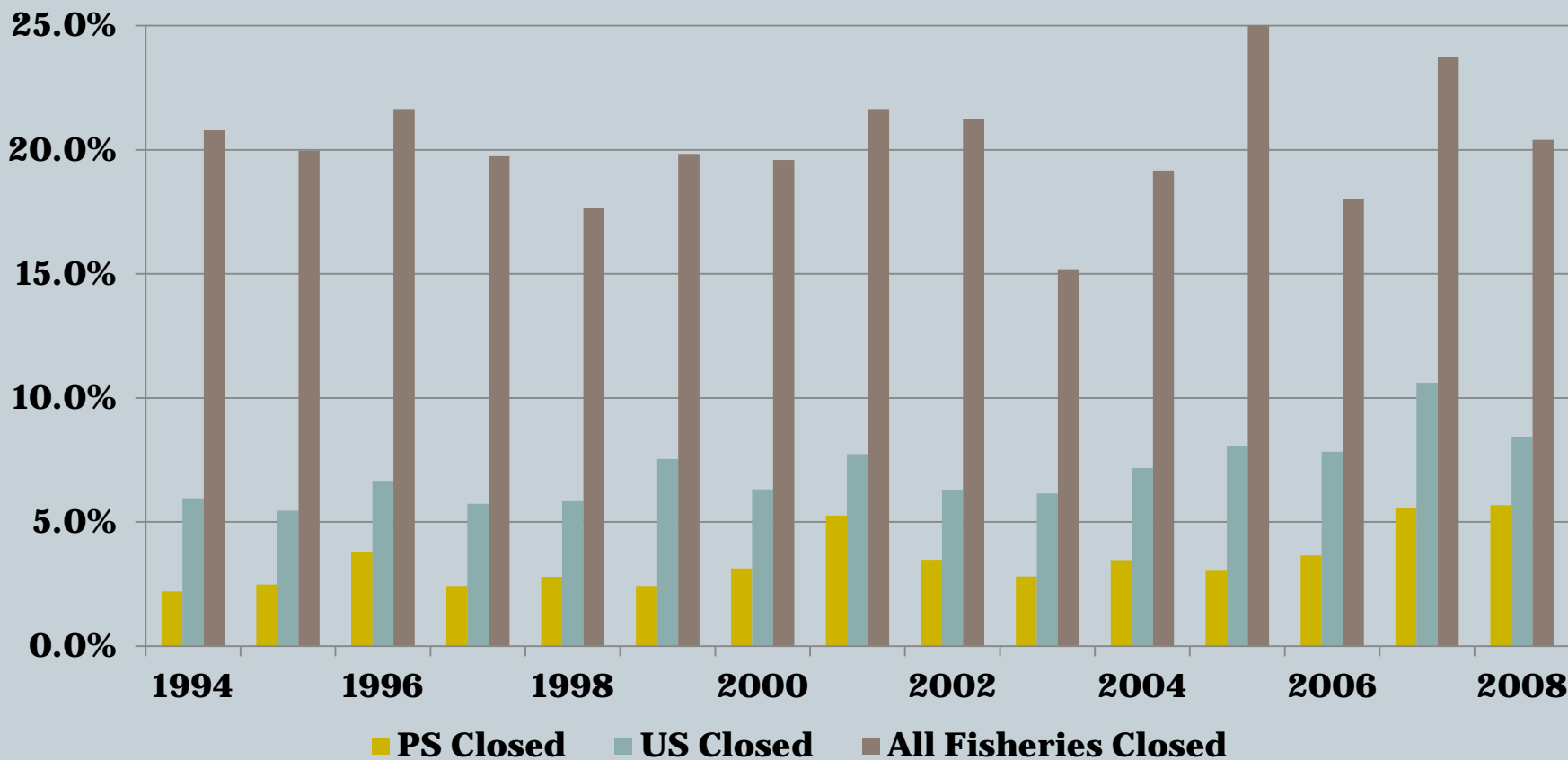


- Any FRAM stock originating in inland waters (Puget Sound, as well as Fraser Earlies, Fraser Lates, and Lower Georgia Strait stocks)

% Increase of Mature Four and Five Year Old Chinook from Marine Fisheries Closures



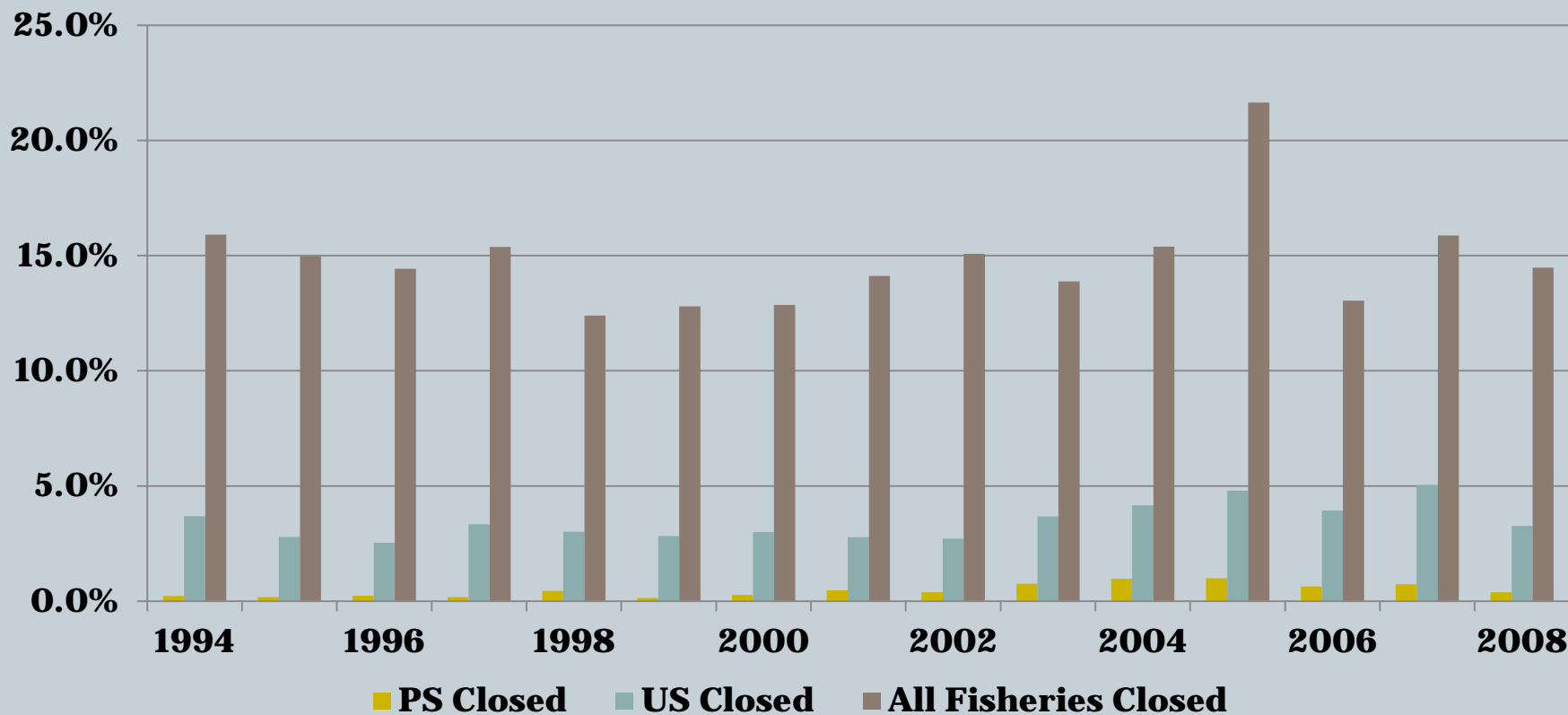
Inland Stocks



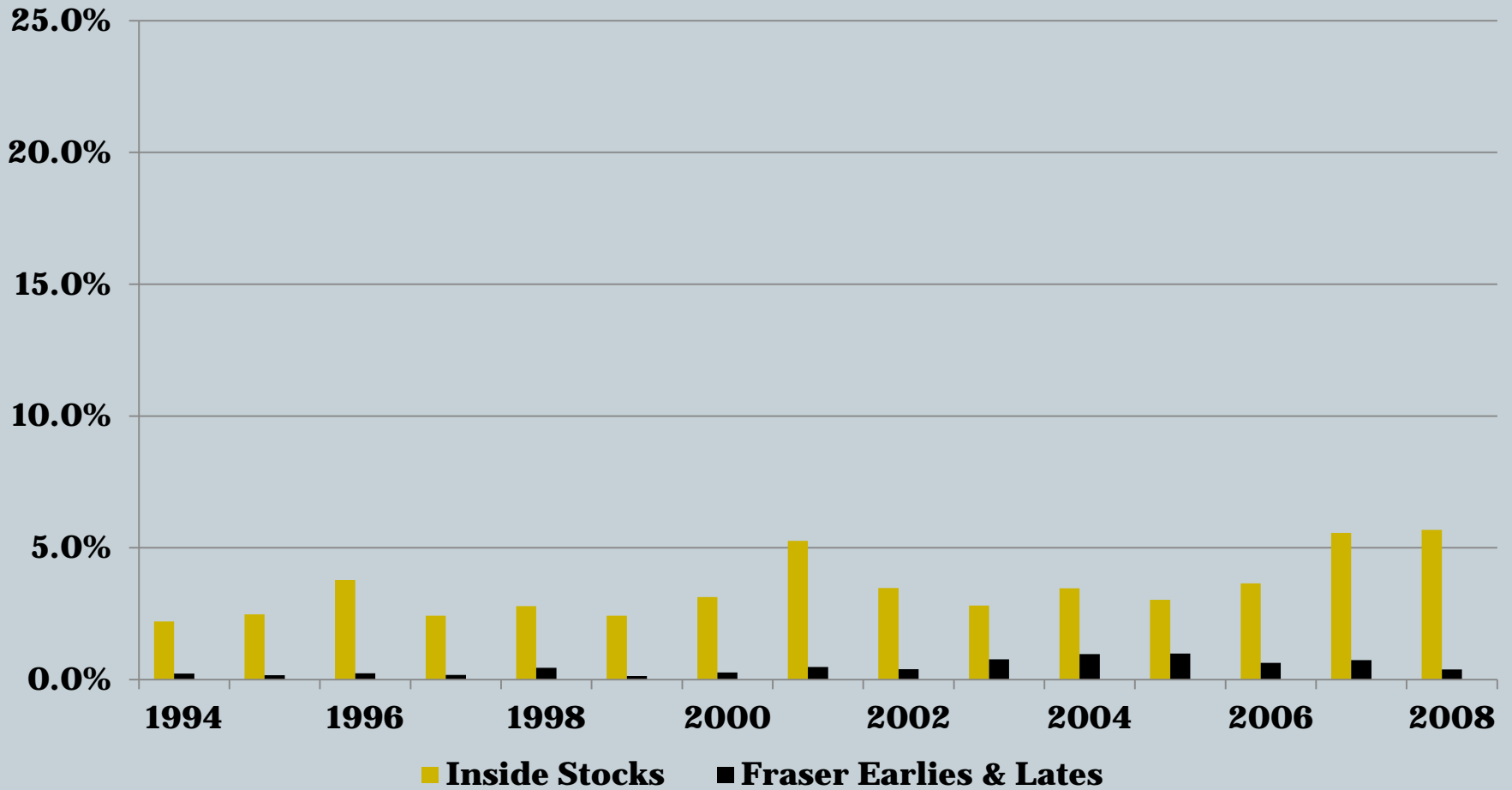
% Increase of Mature Four and Five Year Old Chinook from Marine Fisheries Closures



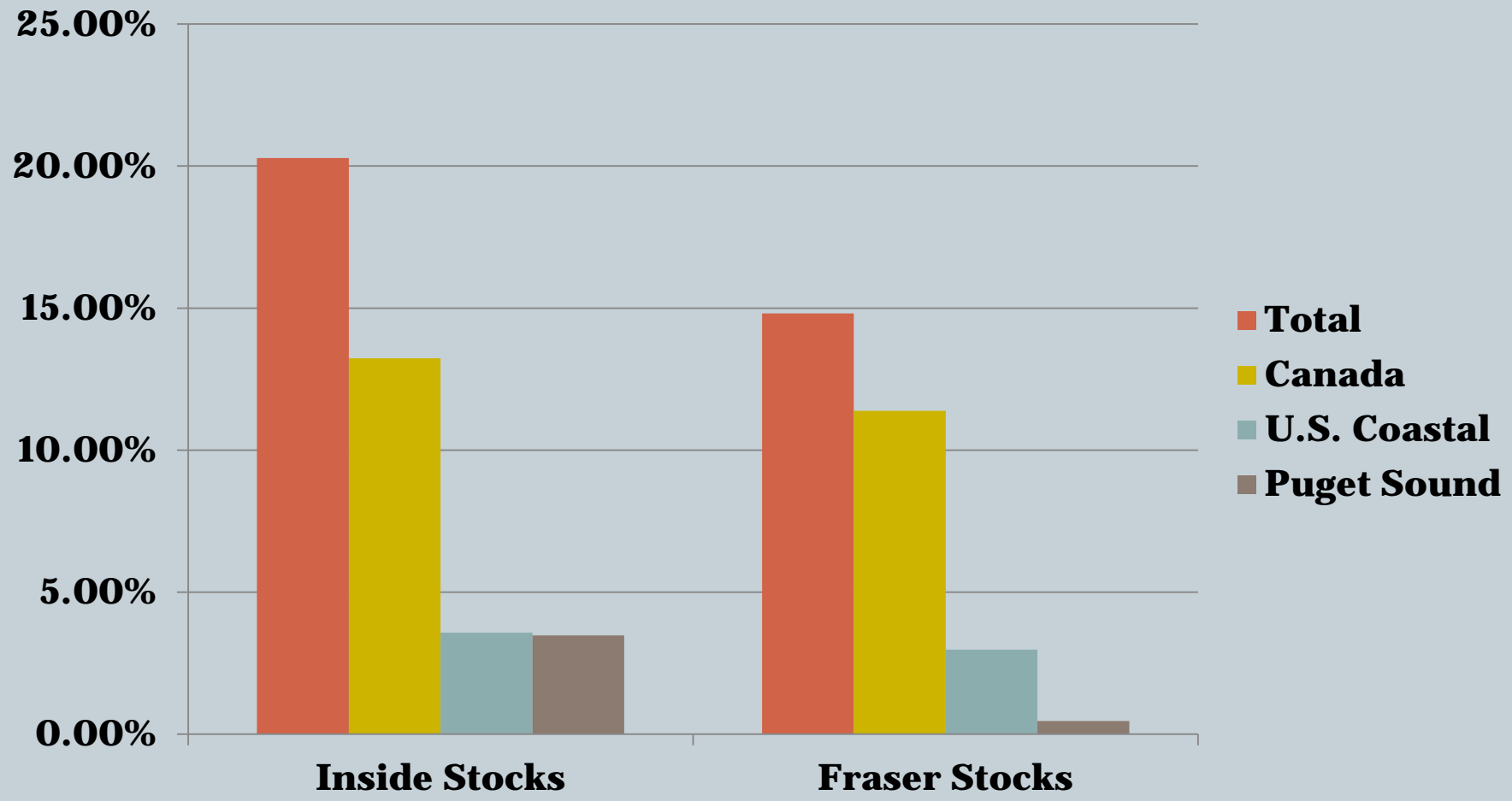
Fraser Stocks



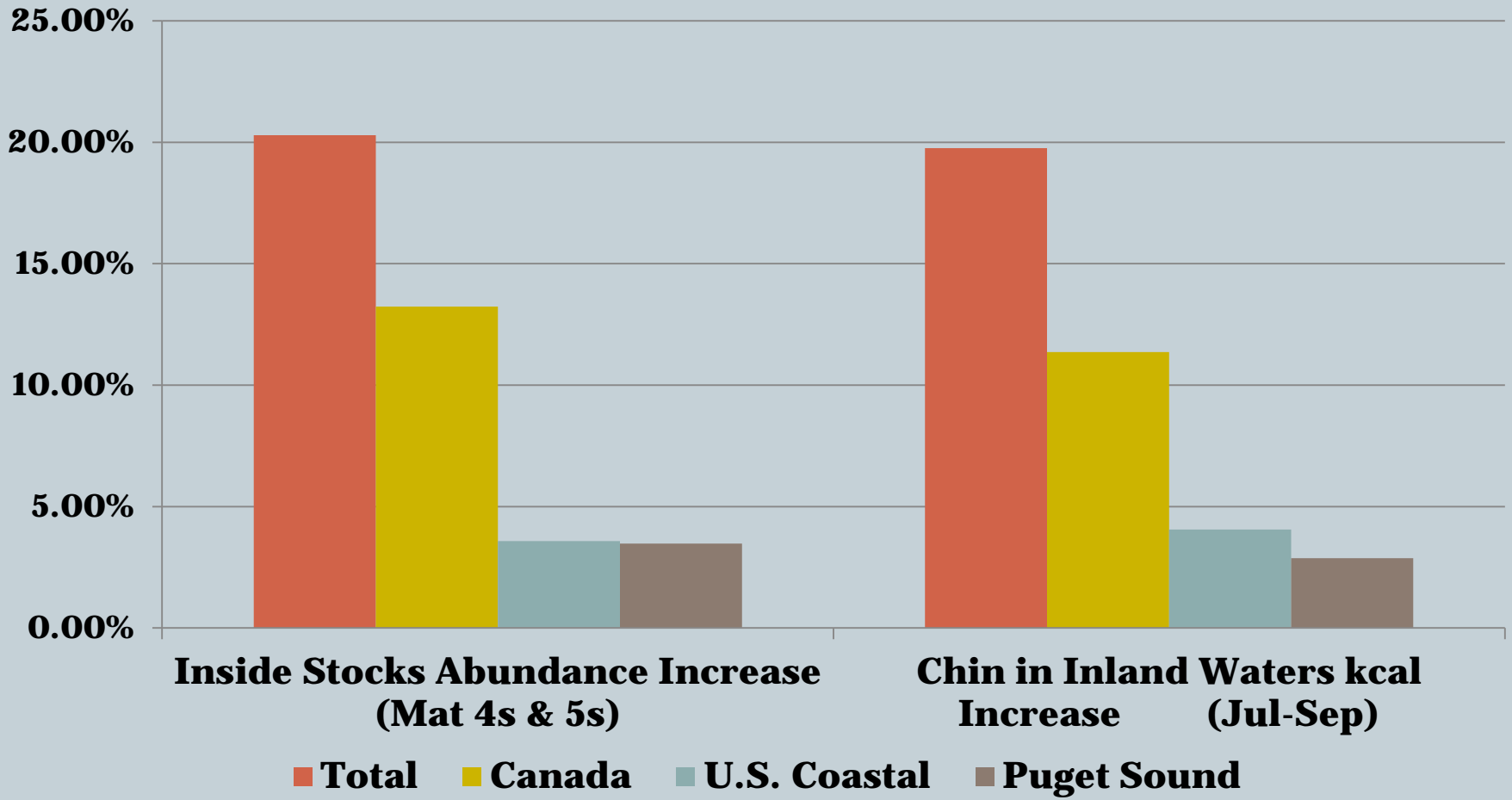
% Increase of Mature Four and Five Year Old Chinook from Marine Puget Sound Fisheries Closures



Average % Increase of Mature Four and Five Year Old Chinook from Marine Fisheries Closures



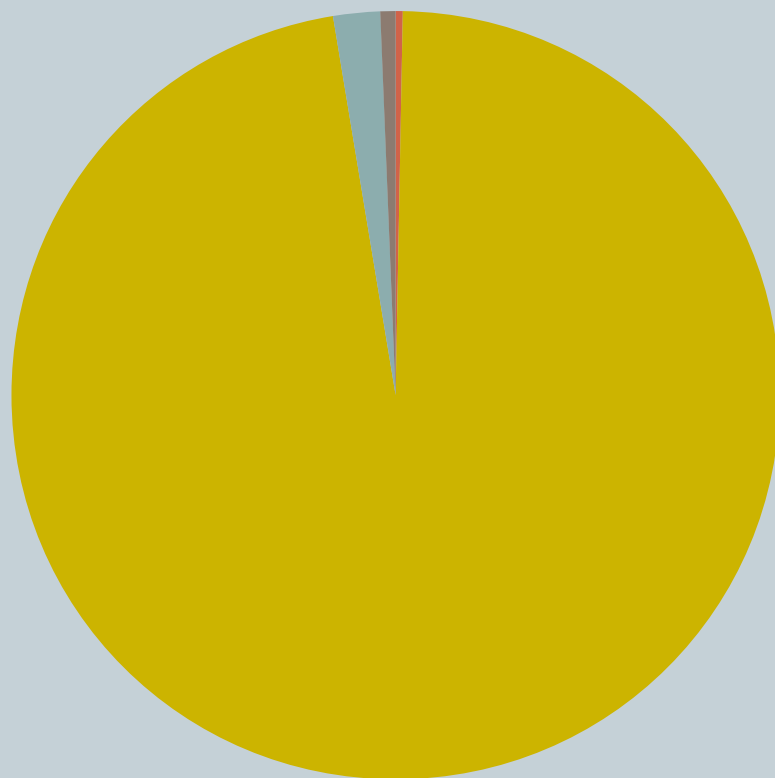
Comparison of Increases from Fisheries Closures between Mature Run Analysis and kcal Analysis



1999 to 2008 Average Mortality of Fraser Earlies (Dome and Nicola) Weighted by Tag Recoveries from Chinook Technical Committee CWT Analysis



**Distribution of Total Fisheries Mortalities
Fraser Earlies (Nicola & Dome)**



- Alaska**
- Canada**
- WA/OR Coast**
- Puget Sound**

Summary of Puget Sound Fisheries Effects



- Marine Puget Sound fisheries closures produce an average abundance increase of mature four and five year old Salish Sea Chinook of about 3.5%
- Marine Puget Sound fisheries closures produce an average abundance increase of mature four and five year old Fraser Chinook of about 0.5%