[Potential] Applications of Genetic Stock ID in the Transboundary and Yukon Areas: A Canadian Fishery manager's perspective.

PSC GSI Workshop:
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Portland, Oregon.

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Overview

- Treaty Obligations requiring stock ID capability;
- Inseason Determination of Harvest Shares;
- Post Season Run Reconstructions;
- Evaluation of Abundance and other Stock ID Estimators;
- Identification and Monitoring of Conservation and/or Management Units;
- Summary of TBR Genetics Workshop


Yukon River Watershed
The United States and Canada Yukon River Joint Technical Committe
Chukchi Sea
Beaufort Sea
Gulf of Alaska
Bering Sea
Barrow
Prudhoe Bay
Arctic Village
Old Crow
Fort Yukon
Circle
Eagle
Dawson
Mayo
Stewart Crossing
Pelly Crossing
Carmacks
Whitehorse
Tagish
Atlin
Teslin
Haines Junction
Beaver Creek
Destruction Bay
Tok
Northway
Delta Junction
Big Delta
Fairbanks
Nenana
Manley Hot Springs
Rampart
Stevens Village
Beaver
Birch Creek
Chalkyitsik
Venetie
Tanana
Ruby
Galena
Nulato
Kaltag
Holy Cross
Russian Mission
Marshall
Pilot Station
St. Mary's
Mountain Village
Emmonak
Anchorage
Valdez
Cordova
Kenai
Seward
Homer
Bethel
Dillingham
Nome
Kotzebue
Inuvik
Skagway
Haines
Juneau
Yakutat
Telegraph Creek
Glennallen
Paxson
Chicken
Chitina
Central
Healy
Anderson
Cantwell
MacMillan Pass
Faro
Ross River
Minto
Carcross
MIDDLE YUKON RIVER
UPPER YUKON RIVER CANADA
PORCUPINE RIVER CANADA
United States
Canada
Scale: 1 : 2,000,000
Projection: Alaska Albers NAD 27

Treaty Obligations requiring stock ID capability

- Canada/US harvest sharing arrangements for Cdn-origin stocks;
- Develop and implement ABM regimes;
- By 2008, the Parties agree to develop and implement through the Committee an agreed Chinook stock identification program to assist the management of Stikine and Taku Chinook salmon.
- For Yukon stocks, the Parties agreed to investigate and recommend stock separation studies that would assist in developing specific fishery management programs for individual salmon stocks;
- The Parties agreed to identify, quantify and undertake efforts to reduce marine catches and by-catches of Yukon River salmon.
- Common objectives of technical committee include:
  - Development of escapement goals;
  - Develop preseason forecasts.

Inseason Determination of Harvest Shares

- Harvest shares for TBR Chinook and sockeye, and Yukon Chinook and chum are specified in the PST as % shares of the TAC of Canadian origin stocks;
- Inseason estimates of total run and TAC require inputs of above border abundance and U.S. harvest of Canadian origin stocks;
- Estimates of U.S. harvest currently based on historical contributions (SPA, professional judgment);
- GSI could be used to provide inseason estimates of composition of U.S. catches;
- Resolution for this task is dependent on how many stocks within each drainage are being managed for.

Post Season Run Reconstructions

- Required for post season evaluations of performance of fisheries with respect to achieving Treaty objectives;
- Required for stock-recruitment databases for use in forecast models, production estimates, survival estimates;
- Requires estimates of stock composition in catches and inriver run;
- Stock ID resolution dependent on number of stock management and/or conservation units.

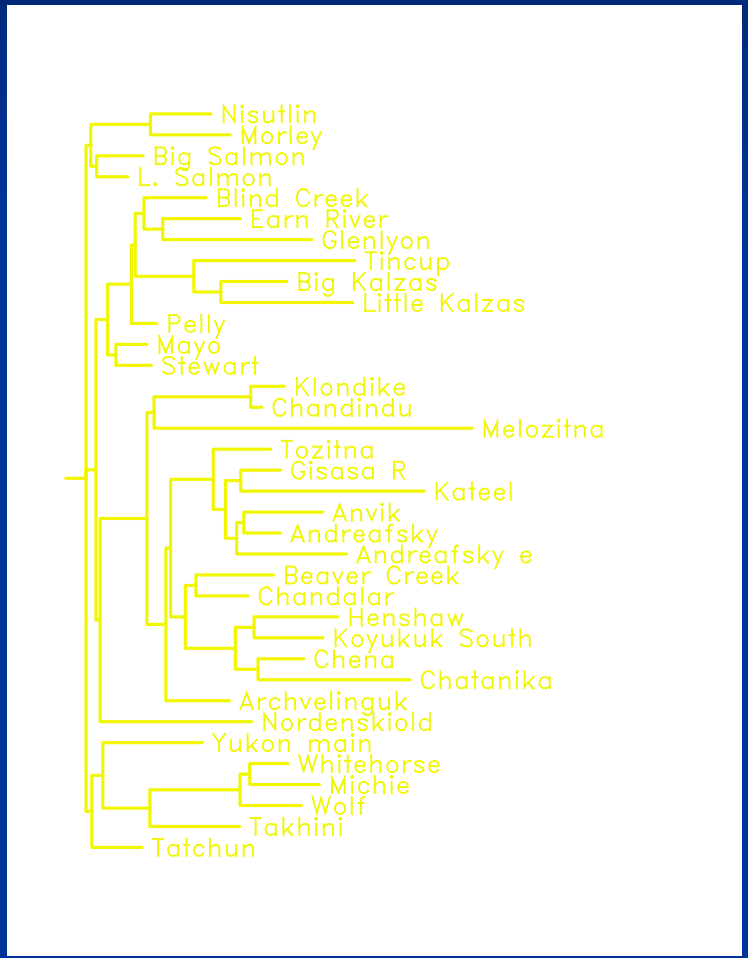
Evaluation of Abundance and other Stock ID Estimators

- Larger drainages currently have main-river abundance estimators;
- GSI sampling in conjunction with main river projects can provide estimates of stock composition and abundance as well as provide independent estimate of total inriver abundance;
- Periodic verification of simpler/other stock ID methods.

Identification and Monitoring of Conservation/Management Units

- The Canadian Wild Salmon Policy requires identification and monitoring of conservation units by species in each drainage;
- Monitoring in TBR and Yukon will be challenging;
- Potential approach:
  - main river estimates of border passage;
  - Sample for GSI at border to get estimates of stock comp.;
  - Sample upstream fisheries for stock ID;
  - Combine to estimate run size and spawning escapement of CU's in Can.;
  - Ground truth - selected intensive stock escapement projects.
- resolution required – high – similar to what micro-sats provide.
- Concerns.

Yukon Chinook Population Structure



North Yukon Tributaries

Stewart River

White River

Mainstem Yukon

Pelly River

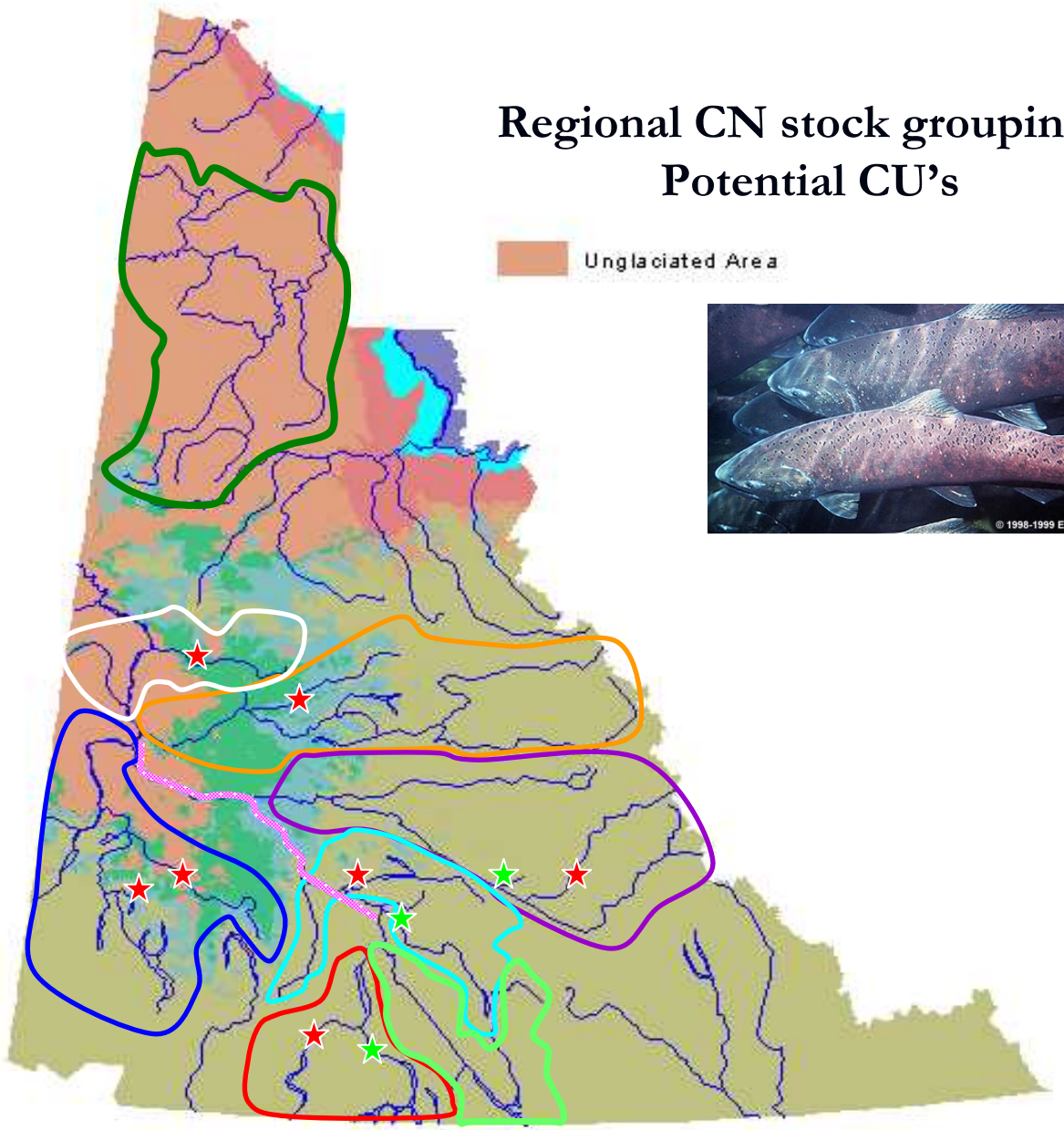
Mid-Yukon Tributaries

Teslin River

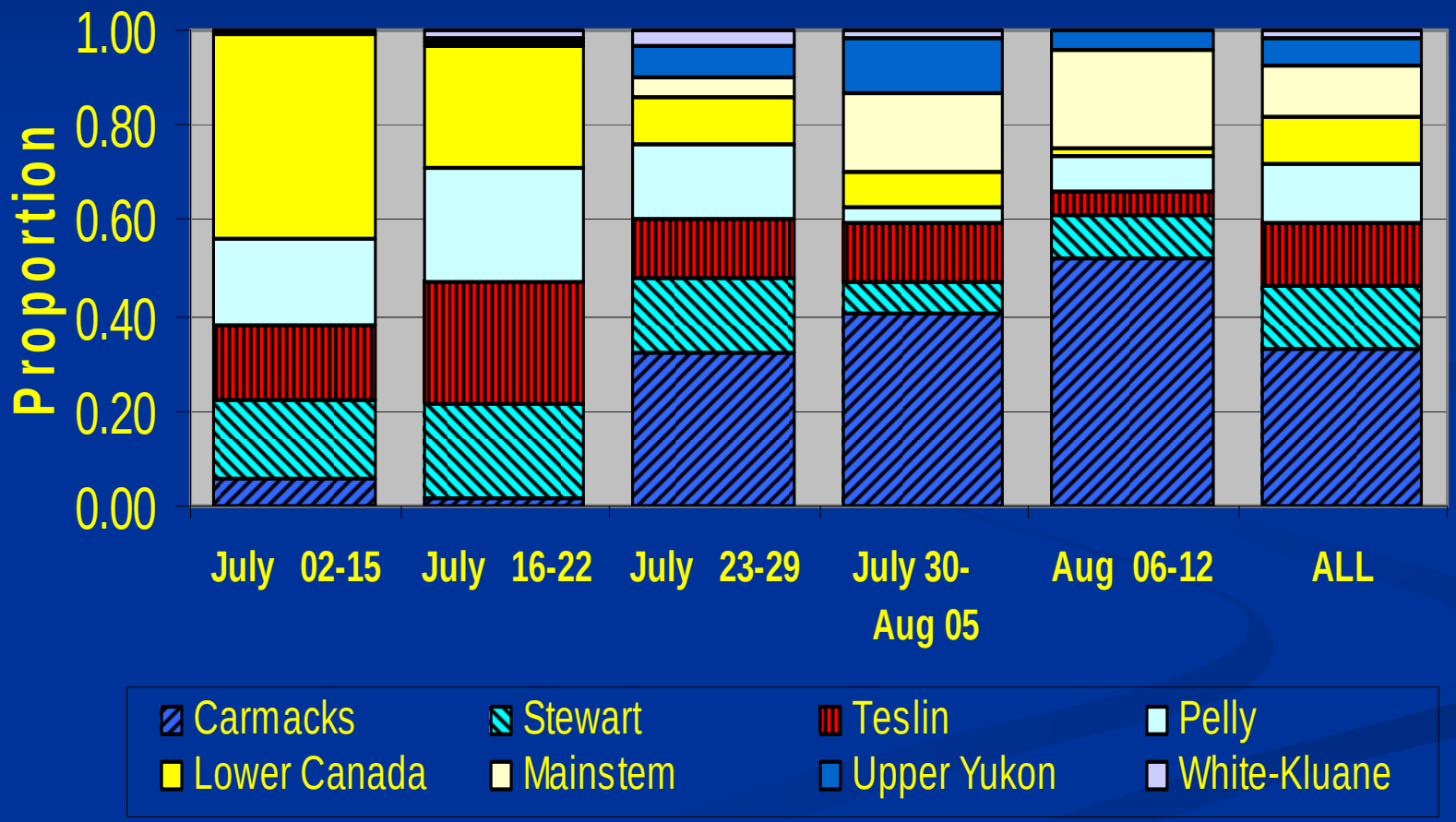
South Yukon Tributaries

Porcupine River

Regional CN stock groupings: Potential CU's



2006 Upper Yukon Chinook Timing By Regional Stock Group



Current GSI Work

- Baseline sampling;
- Post season estimates of stock specific contributions of Yukon Chinook and chum, Stikine sockeye to border passage estimates;
- Post season estimates of stock composition of US catches of Yukon Chinook and chum;
- In-season estimates of stock composition of chum salmon at Pilot Station, lower Yukon.
- Cursory independent abundance estimates, e.g. 1995 Alsek sockeye.

Summary of the TBR Genetics Workshop – Jan.2007.

- Baseline sample inventories reviewed;
- Gaps identified for Chinook and sockeye;
- Sampling and tissue sharing protocol enhanced;
- Follow-up proposal being developed for Northern Fund to address baseline gaps.

TBR Workshop Recommendations

- Establish a Transboundary genetics subcommittee;
- Review baseline sample inventories, identify gaps, prepare collaborative proposals;
- Bring laboratory sample inventories up to par;
- Share baseline samples and samples from fisheries that harvest Treaty stocks;
- Sample and data sharing should follow existing/enhanced protocols;
- Requests for samples should be funnelled through the TTC co-chairs;
- Effectiveness of protocols needs to be reviewed frequently;
- Baselines used to support stock ID programs (independent/joint), need to be able to be evaluated for stock composition estimation. Ideally they should be shared, developed transparently and standardised. Collaborative development of baseline markers is highly recommended;
- N.Fund proposals for TBR stock ID projects should be submitted through the TTC to optimize collaboration and minimise duplication.