San Juan River Watershed: Fish Passage Assessments
March 2011

Objectives
The primary objectives of this project were to:

- Assess the condition of road/stream crossing structures within the San Juan watershed with respect to fish passage
- Generate a prioritized list of structures based on fish passage barrier status
- Recommend treatments (and cost-benefit analysis) for restoration of all priority structures

FIA Project Number - 4031504

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Proponent/Implementing Partners
BC Timber Sales
Pacheedaht First Nation,
M.C. Wright and Associates Ltd.,

Watershed - San Juan River

Watershed Code - 930-053800

Location
The San Juan River Watershed is located on the southwest coast of Vancouver Island, extending east from Port Renfrew. The watershed covers an area of approximately 646,000km^2, and its main waterways include: the San Juan River, Hemmingsen Creek, Harris Creek, Lens Creek, Fleet River, and Granite Creek.

Introduction
The San Juan River watershed is valued both commercially for timber and for conservation of plant, bird, fish species and their associated habitats. The watershed has been logged extensively since the mid to late 1950s, most of which concentrated along the bottoms of the San Juan and Harris valleys, to an extent of roughly 25% in the 1980s (NHC, 1994). Sport fisheries in the area saw a decline in the mid 1980s likely due to habitat degradation resulting from increased sediment production from roads and clear-cut blocks (NHC, 1994). The potential exists that fish passage barriers have been created, either directly or indirectly through infrastructure development in the watershed.

Fish species that utilize the San Juan River and have access to its tributaries include resident and anadromous coastal cutthroat trout (*Oncorhynchus clarki*), brook trout (*Salvelinus fontinalis*), rainbow and steelhead trout (*Oncorhynchus mykiss*), chinook (*Oncorhynchus tshawytscha*), coho (*Oncorhynchus kisutch*), pink (*Oncorhynchus gorbuscha*), sockeye (*Oncorhynchus nerka*) and chum (*Oncorhynchus keta*) salmon, as well as various species of sculpins and lampeys (FISS data - BC MoE, 2011). Three Arm River located in the east of the watershed is known to contain an abundant, isolated population of Dolly Varden (*Salmo Malma*) (MC Wright, 2007; H.Dunn, pers. comm. September 5th, 2007).

Assessments
The funding for this initiative was used to target closed-bottomed structures, and identify which structures were potential fish barriers and qualify for future restoration/replacement. The methods used throughout the project followed the format outlined in the document *Protocol for Planning and Prioritizing Culverted Sites for Fish Passage Assessment and Remediation* and *Fish Passage – Culvert Inspection Procedures* (BC MoE, 2009c and Parker, 2000).

The San Juan River culvert assessments took place in the western half of the San Juan River Watershed, with an emphasis on well-established roads along known fish bearing waterways. Geo-referenced digitized map data of the region and background ecological studies/reports were referenced to plan and establish target assessment areas within the watershed. Once all San Juan priority areas were completed (excluding private lands), the scope of the project was widened to include all

crossings within the San Juan watershed regardless of ownerships or jurisdiction (Price Waterhouse Coopers, 2010).

The San Juan River and its main tributaries were targeted first, including: Hemmingsen Creek, Harris Creek, Lens Creek, Fleet River, and Granite (Renfrew) Creek. Branch roads and spurs were assessed where slope gradients were <30% and vehicle access was possible. Deactivated roads in low gradient areas were attempted to the best of ability.

Prescription

The results of the data collection and analysis phases of the project identified a total of 987 crossings, 953 of which did not qualify for full assessments. Of the 34 crossings that were fully assessed, 16 were further recommended for restoration. The crossings recommended for restoration were ranked by restoration priority. Although factors including habitat quality, potential upstream habitat gained from restoration and fish barrier scores were part of the priority assignment process, habitat quality was considered the most important influence in determining each crossing's priority ranking for restoration. Priority 1 crossings were identified for channels with high value fish habitat. Priority 2 crossings were assigned to channels with moderate value fish habitat and sites with lower-value fish habitat was classified as the lowest priority (priority 3). A single high priority crossing was identified along Harris Creek Mainline, 11 moderate priority crossings and 4 low priority crossings were identified. Prescriptions were developed for each of the 16 assessed structures and cost estimates predicted.

Expected Outputs

The results of the fish passage assessment project provide BCTS with a list of prioritized restoration options to enhance fish passage within the San Juan Watershed.

Total Project Cost - $50,000

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References

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Northwest Hydraulic Consultants. 1994. Impact of forest harvesting on terrain stability, stream morphology and fisheries resources of the San Juan River watershed, Vancouver Island.

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Price Waterhouse Coopers, 2010. LBI Update – September 1, 2010. Forest Investment Account.

Figures

Figure 1: Inlet of a barrier culvert

Figure 2: Outlet of a barrier culvert

Figure 3: Habitat upstream of the crossing
This habitat is currently inaccessible to fish

Figure 4: Habitat downstream of the crossing