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course components for a total of approximately 1,832 hours of training. The individuals who participated in the training have been involved in a variety of projects in the San Juan Watershed as employees of the Pacheedaht Development Corporation.

In summary, the cooperative and jointly-managed program in the San Juan Watershed is and has been a successful program in protecting, improving and replacing fish habitat and fisheries-related recreation opportunities. The watershed restoration plan has been adequately funded, professionally implemented and cooperatively managed by the parties. The work-to-date has created employment, and the working partnership has resulted in increased stewardship for fisheries resources throughout the San Juan Watershed.

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Bella Coola Watershed Restoration Partnership Project

Patricia McKim

The Bella Coola Watershed Restoration project was initiated, and is directed, by a group of community partners, all of whom have an equal voice. The partners are the Central Coast Regional District, the Central Coast Fisherman's Protective Association, MELP, DFO, MoF, private landowners, Interfor, and volunteers interested in the restoration of fish habitat.

Noted for its spectacular scenery, the Bella Coola watershed (Figure 1) is a magnificent and valuable watershed located on the west central coast of British Columbia. From the outlet of Little Charlotte Lake in the Chilcotin Plateau, the clear, warm water course flows due west as the Atnarko River, passing through Tweedsmuir Park. The Bella Coola River is formed where the Atnarko River meets the heavily glaciated

Talchako River, to then flow through the Coast Range Mountains. The area is extensively used by one of the largest concentrations of grizzly bears in the world.

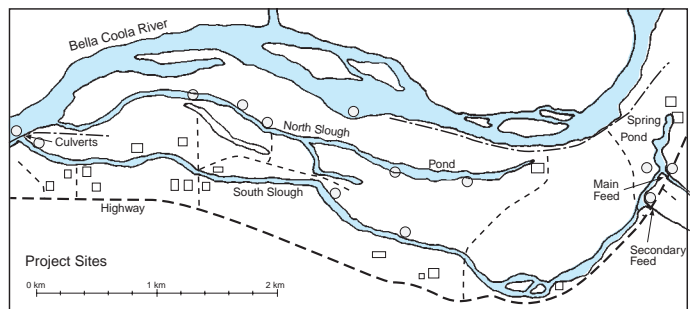


Figure 1. Map of the Bella Coola Watershed.

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Most of the Bella Coola watershed lies within private and Crown land; little of the drainage is in Provincial forest. From the late nineteen-forties to the present, the Bella Coola valley has been logged. As a result, large amounts of debris and sediment have been deposited into the back channels and mainstem. Valuable fish habitat and connection corridors to the mainstem have been eroded during the past fifty years, causing the loss of wintering fry habitat, an overabundance of debris, and seasonal water courses.

In 1996, Summit Environmental Consultants produced an overview of the Bella Coola valley and detailed WRP assessments of the area, to identify restoration priorities. The private land sites along the valley floor demonstrated the most damage from past forest harvesting. This area was proposed as the only high value opportunity to mitigate the impact of past logging activities in the high gradient areas surrounding the valley. The lower valley habitats are the most critical for overwintering salmonids and spawning trout populations, and they provided the greatest opportunities for restoration.

A group of interested parties, having in common their belief in placing fish first (and local politics aside), became the Bella Coola Watershed Restoration Partner Group. Following the environmental assessment and prioritization of “best bang for the buck” projects, members were able to establish a meaningful rapport within the partner group. Everyone brought hands-on skills and respect for each other’s opinions to the table; not all members of the group had superior technical knowledge or experience. Respect for the private land owners concerns and individual ideas of habitat restoration helped to strengthen the dedication of all partners. Mutual accord, love of the Bella Coola system, concern for previous degradation, and a focus on strengthening and repairing existing valuable habitat made for a winning combination that meant the Bella Coola Watershed Restoration Project would be one of the more pleasurable projects to work on.

The basic goal of the Bella Coola Watershed Restoration Project was to encourage the re-establishment of optimum stream configurations containing the desired elements that fish prefer. Successfully obtaining funding for an Forest Renewal BC project on private land was a difficult accomplishment. Since the most valuable habitat was held fee simple, once funding was in place, it was up to community members of the partner group to ask land owners for permission to begin the work. All resident landowners were concerned with the decline of fish populations and readily agreed to allow habitat to be created. Further, these landowners

agreed to maintain the habitat on the private lands, once it had been restored.

Technical staff worked with landowners to develop prescriptions. Landowners who owned equipment were offered first option for equipment use, and the instream work began. The objective was to re-establish the lost natural pool-riffle sequence of streams, important for holding and rearing habitat. This was accomplished by placing log-rock deflectors on opposing banks on a frequency-based channel width, volume and gradient (Figure 2). This technique was applied and proven to specific sections of a local slough.

We added complexity, building this using small logs, usually available on site. These areas were partially filled with small woody debris, as part of the stream clean-up (Figure 3), then were topped with rock for stability. These structures were keyed into the banks

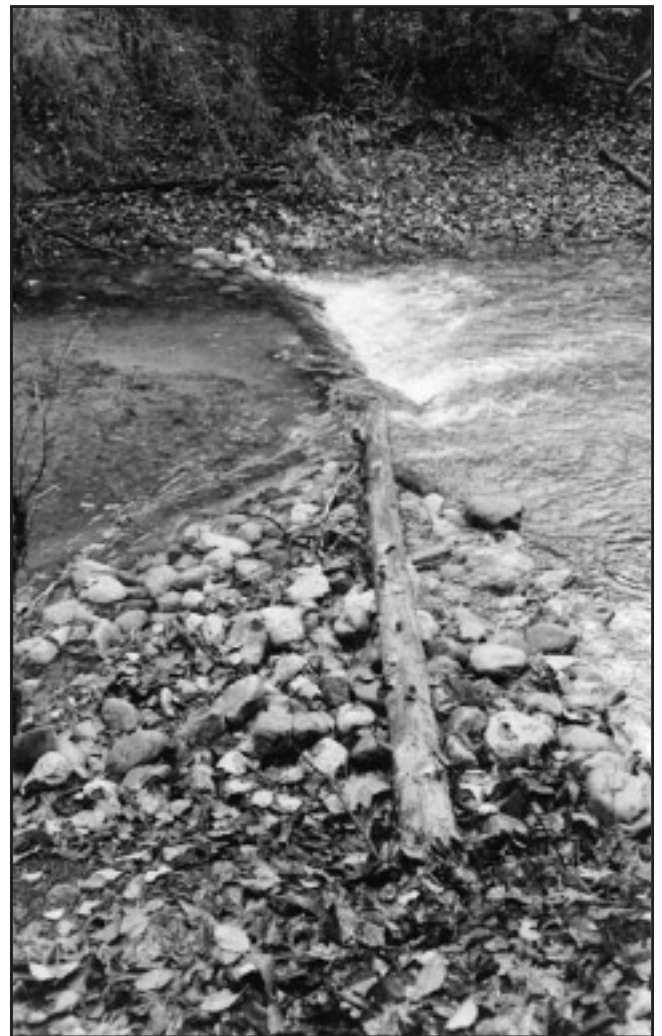


Figure 2. Log-rock deflectors were placed on opposing banks to re-establish the lost natural pool-riffle sequence.

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Figure 3. Most of the restoration work was done by hand, using materials that were on-site.

and extended partly into the stream, concentrating the main force of the current toward the middle of the channel and reducing erosion risk to adjacent banks. The final task in the restoration process was the creation of pools or deep runs (Figure 4). This provided for adult holding and juvenile rearing in a formerly broad shallow channel that had lacked these essential fish habitat components. These instream structures emulate natural processes and are easily built by hand, usually from existing materials available at the site.

The project has already demonstrated success. During 1998, more than 400 coho spawned in this area, often in locations where spawning had not been observed previously. The spawning was near the sites where the habitat restoration had occurred. As there was a coho closure in the area this year, it is difficult to assess whether the number of spawners increased because of the coho closure, the creation of healthy habitat, or both. Having noted emerging fry in the new pools in large numbers, we consider the project to be successful.

The long term environmental benefits include stream restoration techniques that will stabilize the flow regime and sediment transport functions at target sites. The stabilization and expected increase in salmonid populations in the valley are likely to benefit other species in the food web and nutrient cycles.

Further benefits of this project include:

- the projects are located near schools, and now offer an outdoor training and classroom experience
- this project is easy to monitor and maintain because of proximity to the community
- we employed displaced forestry workers and fisheries workers, and the skills these employees



Figure 4. Restored creek showing pools and deep runs.

gained on the job are transferable to other fish and habitat enhancement work that is occurring in our community

- the project has fostered a strong sense of community pride and stewardship towards fish

On-site visits to the restoration projects are welcome, and volunteers are happy to show visitors to the Bella Coola valley the accomplishments of the restoration project.

The Bella Coola Watershed Restoration project is in the second year of a five-year mandate.

Unfortunately, FRBC funding for this project has been discontinued, and the future of the project is uncertain. It is disheartening to note that there seems to be a significant decline in WRP project funding at a most critical time, with fish stocks in crisis. Continued funding is essential for projects, such as the Bella Coola Watershed Restoration, that have demonstrated the successful restoration of degraded habitat to increase spawners and support the rearing of fry.

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