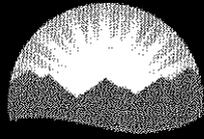


British Columbia Flood Protection Program Presentation to BCWF

April 11, 2008



Ministry of
Public Safety
and Solicitor General

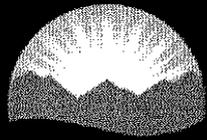


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Overview of Flood Issues

- **Flooding is always a risk in British Columbia.**
- **For the last century more and more settlement has occurred along waterways, including the Fraser River.**
- **Flood protection and control methods used extensively along the Fraser River have allowed this development to occur.**
- **Diking protects people and environment, but restricts the natural flow of the Fraser River – no longer able to meander across entire valley.**
- **Spring 2007 flood risk raised public awareness of potential threat.**

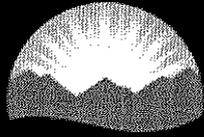


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Gravel Accumulation in the Fraser River

- Each year approximately 285,000 m³ of gravel are deposited in the Fraser River between Hope and Mission, raising the bed of the river.
- This continues to increase the flood threat requiring these dikes to be raised, and also results in erosion of the dikes.
- A consistent, long term, gravel and sand removal strategy will help reduce the overall impact and flood threat.



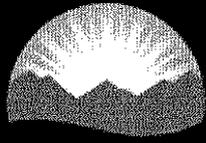
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Provincial Flood Protection Program

Includes the following components:

- **Upgrading of dikes and associated structures.**
- **Land use planning and local government planning and zoning.**
- **Risk analysis of flood consequences.**
- **Gravel removal for flood protection purposes;**
- **Emergency Planning.**
- **Information sharing including coordination of technical and scientific information.**

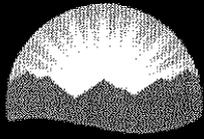


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What's at risk?

- **Fraser Valley population.**
- **\$40 billion of infrastructure – not just businesses, but hospitals, schools and homes.**
- **Majority of B.C's farms are located in this region.**

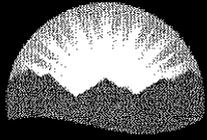


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Flood Risk to Fish Resources in BC

- **When floods occur, fish habitat is often destroyed and fish killed.**
- **Toxic pollutants can potentially mix with the water, killing hundreds if not thousands of fish.**
- **Fish can become “stranded” outside of normal waterways.**



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Why Fraser River Gravel Removal?

To protect public safety, in an environmentally responsible way.



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The Gravel is Gold Myth

- **Elimination of gravel royalties.**
- **Land based gravel pit produce cheaper and better gravel.**
- **ILMB call for tenders in 2004.**

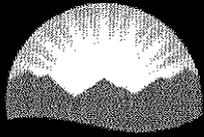


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Protecting the Environment

- **Environmental assessments (CEAA).**
- **Obtaining federal and provincial permitting.**
- **Pre, during, and post hydraulic studies.**
- **Pre, during and post fish sampling.**
- **Pre and post topographical surveys.**
- **On site Environmental monitoring.**
- **Habitat studies.**



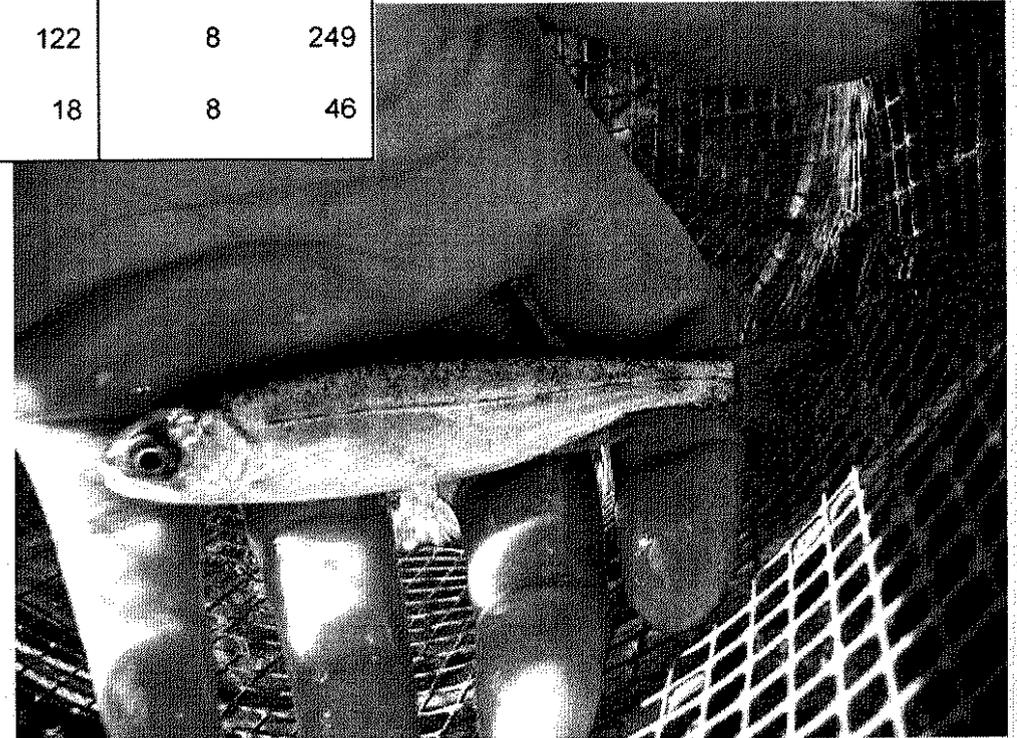
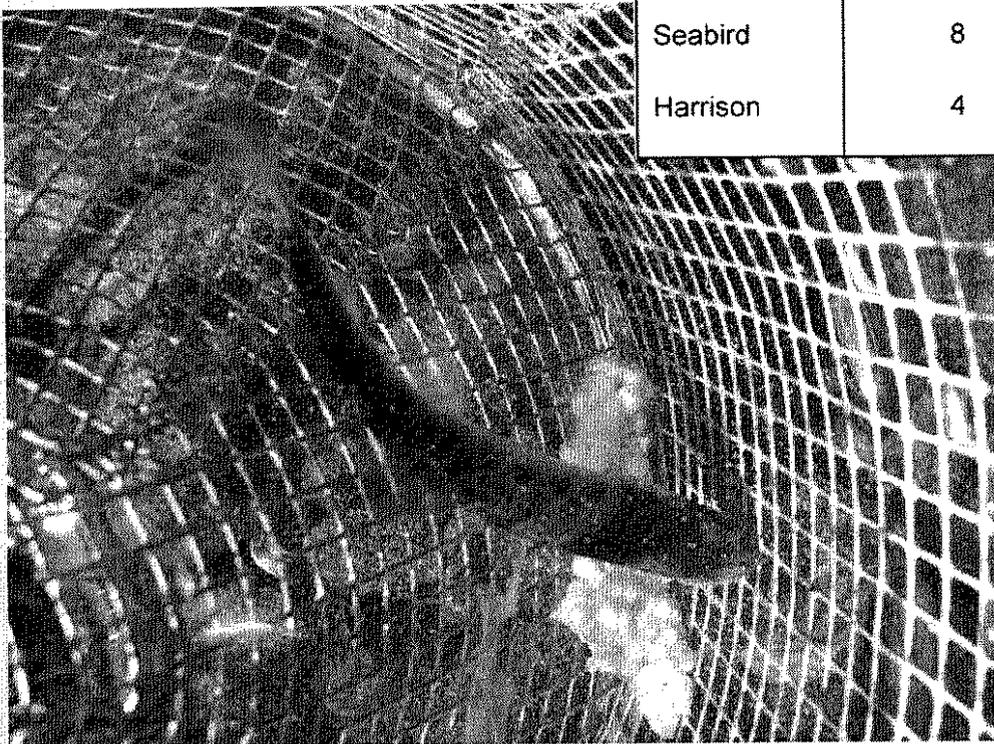
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Environmental Monitoring

	pre extraction Jul-04		post extraction Aug-05	
	species	number	species	number
Big	9	132	8	150
Seabird	8	122	8	249
Harrison	4	18	8	46





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Environmental Follow Up Findings 2007

A total of approximately 195,000 m³ of gravel was extracted from the Fraser River in 2004; 55,000 m³ from Big Bar, 50,000 m³ from Seabird and 90,000 m³ from Harrison Bar. The final grade and topographic conditions at all three excavation sites complied with specifications of the design plans with no apparent negative environmental impacts.

Fraser River Gravel Removal Big, Harrison and Seabird
Island Bars Environmental Monitor's Follow-up Report, 2007



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Pre-During-Post Gravel Extraction Information Requirements for the Lower Fraser River

- **Surveys.**
- **Surface Sediment Sampling.**
- **Juvenile Fish Sampling.**
- **Benthic Invertebrates [bugs] Sampling.**
- **Habitat Mapping.**
- **On site Environmental Monitoring.**
- **River Hydraulic and Water Flow Assessment.**
- **Maps and Drawings.**
- **Habitat Compensation Plan, where required.**

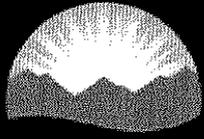


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Gravel Removal From Lower Fraser River (Hope to Mission)

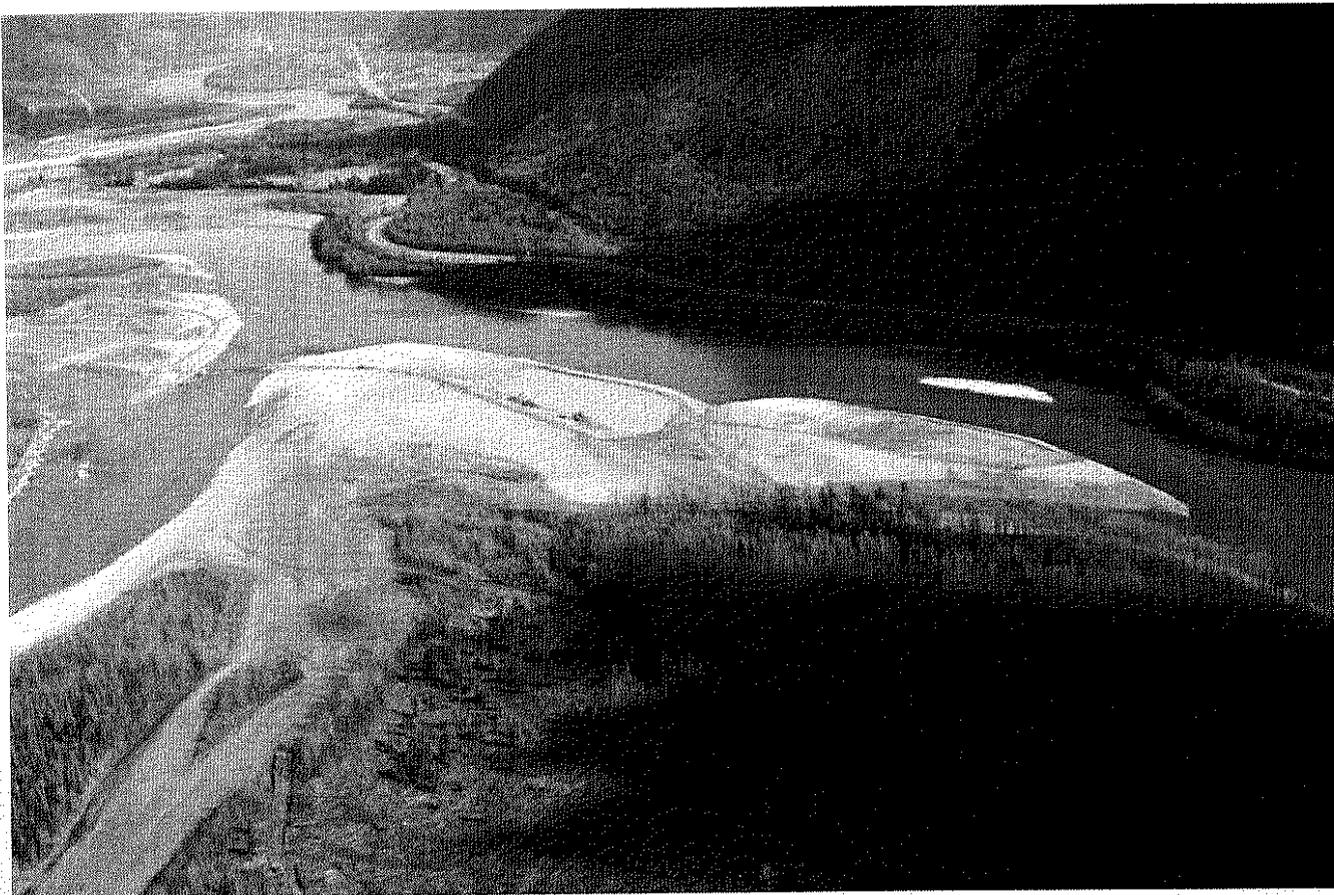
Bar Site	2005 Cubic Meters	2006 Cubic Meters	2007 Cubic Meters	2008 Anticipated Cubic Meters	Total Cubic Meters
Spring Bar	8,000		25,000	339,500	372,500
Herrling	33,000	133,000			166,000
Tranmer					
Big Bar		60,000			60,000
Hamilton		10,000		38,000	48,000
Gill Island	50,820	70,000			120,820
Harrison					
Queens	58,000				58,000
Total:	149,820	273,000	25,000	377,500	825,320
<i>Planned Removal</i>	<i>500,000</i>	<i>500,000</i>	<i>420,000</i>	<i>420,000</i>	<i>1,840,000</i>
<i>Shortfall:</i>	<i>(350,180)</i>	<i>(227,000)</i>	<i>(395,000)</i>	<i>(42,500)</i>	<i>(1,014,680)</i>

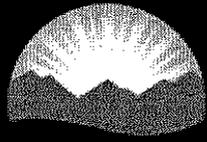


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Spring Bar Post Extraction

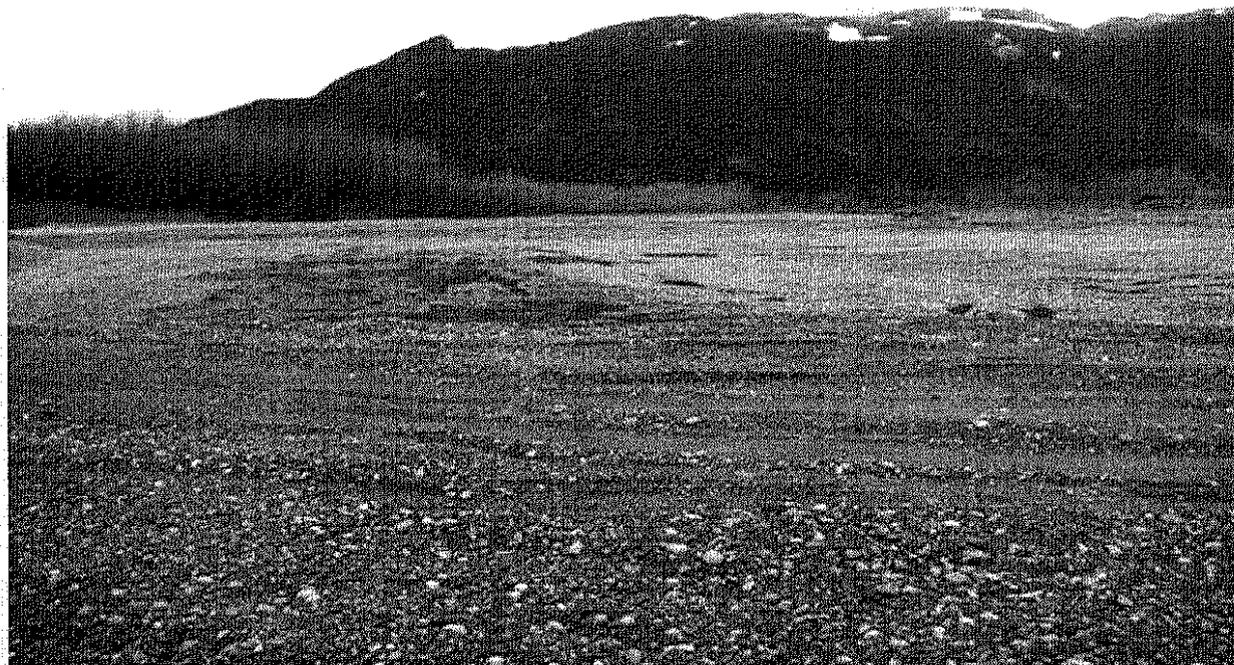


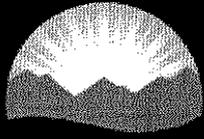


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Hamilton Bar Post Extraction

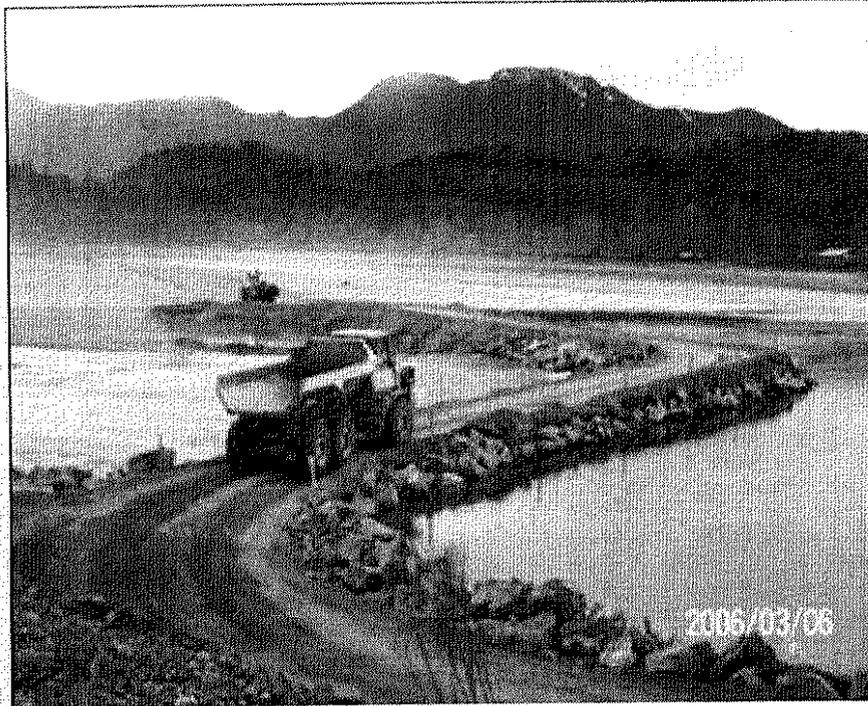




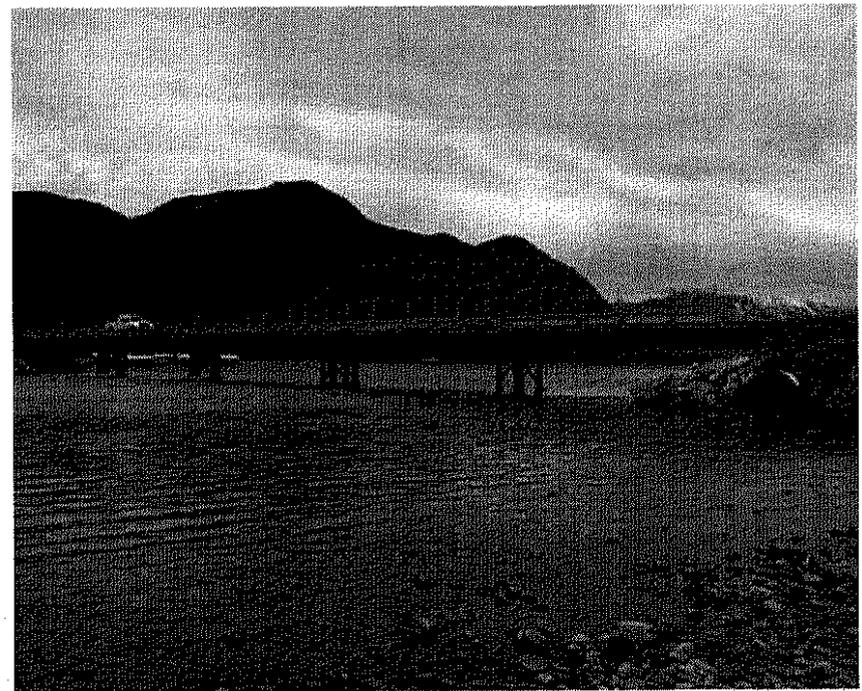
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Big Bar Lessons Learned and Applied at Spring Bar



Big Bar (2006)



Spring Bar (2008)



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Moving Forward

- **Province will be responsible for ensuring gravel is removed.**
- **Long term study programs will be established to monitor effects of gravel removal.**
- **The research collected will guide the program.**
- **Biological and Hydraulic experts will guide the process.**

