COLUMBIA RIVER CHANNEL IMPROVEMENT PROJECT

ESA FISH RELATED TASKS

- Dredging Forecast 1995-96
- Salinity Workshops 1995-96
- Sediment Quality 1997
- Hydraulic & Sediment Impacts 1996-97
- Water Quality Impacts 1998
- Aquatic Resources Impacts/ Coordination Act Report 1998-99
- ESA Consultation with NMFS 1999

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ENVIRONMENTAL BASELINE

- 40-ft navigation channel
- 55-ft entrance channel w/jetties
- Existing estuary/river conditions
  - Columbia River Estuary Data Development Program
  - Estuary Program
  - Corps' O&M investigations
    - Maintenance Improvement Review 1987
    - Long Term Management Strategy 1990
    - Sediment quality monitoring
    - Salmon migration & behavior
    - Benthic investigations
    - Entrainment studies

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DREDGING FORECAST

- Bar-by-bar analysis
  - dredging and disposal practices 1980-1995
  - bathymetric changes 1982-1995
  - bedload dominant
- 20 mcy of new work dredging
- 90 mcy of O&M in 20 years
  - 12 mcy more than w/o project
  - 20-25% reduction from past levels
- Disposal practices are dominant influence on future O&M

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SALINITY INTRUSION

- Three workshops with State and Federal resource agency representatives
- Salinity model by Waterways Experiment Station
- Biological evaluation

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SALINITY INTRUSION

- WORKSHOP 1
  - Salinity model overview
    - to gauge general response to 3 ft deepening
    - verified to reproduce general qualitative behavior
    - CREDDP database
  - Agency representatives
    - agreed to flow range to be modeled
    - identified habitat areas of interest
    - asked for improvements to model geometry
  - Initial discussion of biological concerns, including ESA fish

SALINITY INTRUSION

- WORKSHOP 2
  - Salinity model results
    - small increases along channel bottom
    - very small increases in shallow, low salinity habitats
    - requests for additional site specific results
  - Review of available biological information
    - CREDDP
    - other salinity tolerance data
  - Definition of specific biological concerns
    - species
    - salinity tolerance
    - distribution

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SALINITY INTRUSION

- WORKSHOP 3
  - Final salinity model results
  - Species by species evaluation of potential impacts due to salinity increases
    - benthic invertebrates
    - aquatic vegetation

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SALINITY INTRUSION

Consensus agreement from NMFS, USFWS, ODFW, ODEQ, WDFW, & EPA rep's that:

"No significant biological impact would result from the salinity changes predicted for the proposed channel deepening"

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Sediment Quality Sampling

- 1997 Sampling Plan
  - based on draft "Dredged Material Evaluation Framework, Lower Columbia River Management Area"
  - State and Federal agency review
- Sampled all shoal areas
- 89 grab samples collected by NMFS
- 90 physical analyses
- 23 chemical analyses

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Sediment Quality Results

- Channel averaged:
  - 99.7% sand
  - 0.62% Total Volatile Solids
- One channel sample exceeded 20% fines, probably old Willamette River disposal
- Three samples outside of channel exceeded 20% fines

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Channel Sediment Quality

- Metals Max Value (ppm),
  - Ar 2.0, Cd <0.8, Cr 7.0, Cu 9.0, Pb 4.0, Hg <0.05, Ni 12.0, Ag <0.6, Zn 57.0
- Max TOC 0.08%, 12 of 19 samples <0.05%, Average 0.03%
- Max Pesticides Value (ppb)
  - Aldrin 0.2
  - No other Pesticides detected (<2.0)

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Channel Sediment Quality

- Max PCB Value <10.0 (detection limit)
- Max PAHs (ppb)
  - Total Low PAHs 19.0
  - Total High PAH 21.0

- Sediments are suitable for unconfined in-water disposal

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HYDRAULIC & SEDIMENT

- Water surface profiles
  - no changes up to RM 70
  - reductions u/s of RM 70
    - 0.12 ft at 80,000 cfs u/s RM 107
    - 0.18 ft at 210,000 cfs u/s RM 107
- Riverbed side-slope adjustments along deepest cuts
- Minimal impact to shoreline erosion
- No changes in sediment budget
- No change in sediment discharge to ocean

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WATER QUALITY

- Sediment settles rapidly
- Small, transient increases in turbidity
- Local, short-term reduction in DO

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AQUATIC RESOURCES

- Salinity workshops
- FEIS
  - No entrainment
    - juvenile salmon migrate along channel margins
    - no salmon entrained during dredging tests
    - only two salmon entrained in test with draghead off the bottom
  - No significant impact on juvenile habitat

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AQUATIC RESOURCES

- USFWS Coordination Act Report
  - Year round dredging would cause no significant salmon entrainment
  - Avian predation is being addressed
  - Minimal impact on shoreline erosion
  - Contaminants
    - sediment suitable for in-water disposal
    - very short-term, minor fine grained transport
- Biological Assessment consultation with NMFS
  - No entrainment
  - No significant impact to salmon habitat
  - Minimal impact on shoreline erosion
  - Avian predation is being addressed

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Technical Issues

Issue	FEIS Impact	FEIS Location
Altered flow and salinity	Minor changes to flow and salinity	Salinity model & workshop; water surface profile
Altered ETM	Not specifically addressed, not an issue	
Reduced ability to function as a conduit to ocean	Not specifically addressed; Minor flow changes in estuary	Salinity model & workshop; water surface profile
Reduced sand transport to ocean	No change	Physical Impacts: Sediment Budget

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Technical Issues

Issue	FEIS Impact	FEIS Location
Dredging forecast is too low	Not specifically addressed; forecasting methods are explained	Structural Alternatives: Maintenance Dredging Forecast
Increased suspended sediment	Limited and transitory, minor compared to background	Water Quality Impacts
Change bathymetry	Limited to areas adjacent to channel	Physical Impacts: Riverbed and Sedimentation
Deposit in spawning gravel	Not specifically addressed; no sedimentation changes	Physical Impacts: Riverbed and Sedimentation

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Technical Issues

Issue	FEIS Impact	FEIS Location
Redistribute contaminants	No significant impact	Sediment Quality Impacts: Navigation Channel
Behavioral/sub-lethal effects of increased turbidity	No significant impact	Water Quality Impacts
Adult salmonid migration routes	Not addressed; not an issue	
Contaminant exposure pathways	Not addressed; not an issue	

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Technical Issues

Issue	FEIS Impact	FEIS Location
Alteration of the food web	No significant impact	Salinity workshop biological assessment
Alter salmonid habitat	No significant impact	Salinity workshop biological assessment; Physical Impacts, Riverbed and Sedimentation
Entrainment	No significant impact	Threatened and Endangered Species
Stranding	Not an issue	
Dredging Window	No significant impact from year round dredging; O&M not restricted	Corps response to Coordination Act report
Monitoring of physical and biological processes	No need identified	

CONCLUSIONS

- No significant impacts to the physical environment
  - Hydraulics
    - salinity
    - water surface elevations
  - Sediment transport/budget/discharge
  - Bathymetry
  - Sediment quality
- No significant salmon impacts
  - Habitat
  - Food web
  - Migration

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