Swede Heaven Fish Surveys

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Outline

- Project history and permitting
- Review of construction process
- Description of survey methodology
- Summary of study results
- Conclusions
Project History and Permitting

- 1996–1998 Cooperative Bank Stabilization Project
- 1999 – 2004 Design modification and permitting
- 2005 – 2009 Project construction and monitoring
COIR WITH WOOD STAKES
AT 4' O.C.
(SEE NOTES 1 AND 2)

EXISTING GROUND
2' TOPSOIL

TOP ARMOR ROCK ELEV
(SEE TABLE)

PIT RUN
GRAVEL TO
FILL VOIDS

ARMOR ROCK WITH
CHINKED VOIDS

4'-5' DIA ROCKS
AT TIP

BOTTOM QUARRY
SPALL ELEV

12" THICKNESS
QUARRY SPALLS

CONSTRUCTION GEOTEXTILE
FOR SEPARATION

4' O.H.W.M.

W.S. 100 YR.

SEE NOTE 3

14' TOE
Treatment Reach

2006

2009
Monitoring Plan

- Established by the Biological Opinion
- Assess fish use in treatment reach
- Compare to fish use in a reference reach
- Conduct 3 snorkel surveys per year for 3 years
Pre-Project Conditions

Treatment Reach

Reference Reach
Data Collection
Total Fish

Winter

Spring

Summer

Reference

Treatment
Inside vs. Outside Fish Counts

Winter

2007
2008
2009

Spring

2007
2008
2009

Summer

Inside
Outside
Inside
Outside
Inside
Outside

Reference
Treatment
Distribution Along Reach

Treatment Reach

Number of Fish vs Transect

- LWD 1
- LWD 2
- LWD 3
- LWD 4
- LWD 5

Yearly Distribution:
- 2007
- 2008
- 2009
Fish Observations

- 74 – 95% salmonids
- Few fish in winter and spring (mostly trout)
- 30% coho salmon in summer
- No coho overwintering
- Few Chinook salmon (0-age only)
- Only 6 bull trout (spring and summer)
Conclusions

Winter vs. Spring – Little difference

- Between reference or treatment reaches
- Between nearshore and offshore snorkelers
- Between years (except 0-age fish in 2009)

No apparent value in doing both seasons

- Both were too early to monitor young-of-the-year fish
Conclusions

Summer - Substantial and consistent differences

- Order of magnitude more fish in summer
- At least twice as many fish in Treatment Reach
- Two to three times more fish nearshore
- Apparent preference for habitat structures
Conclusions

- Rock groin approach provides:
  - Good bank stability
  - Added complexity to instream flow conditions
  - Anchors the LWD to provide instream habitat