

# Planning and Logistics of Stream Restoration – Tools and Resources



Scott Snedaker

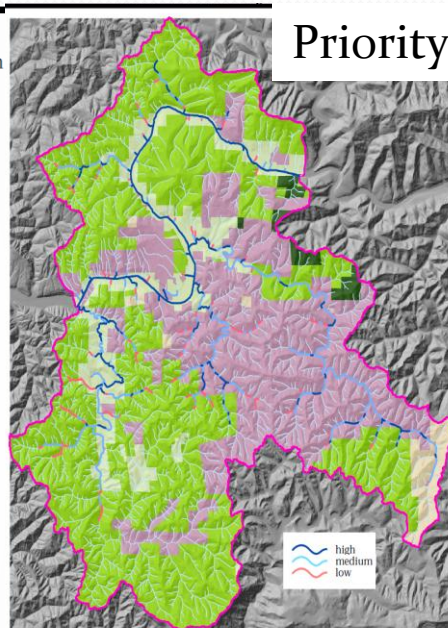
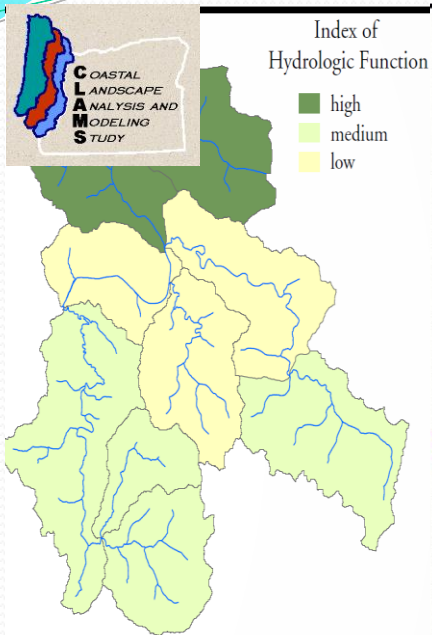
Fish Biologist

Salem District

Bureau of Land Management



# Figure out Where!



Why Here?  
Why Now?





# Figure out Why!

Access



Limiting Factors Analysis

- How should it work?
- What's missing?

Stream Function

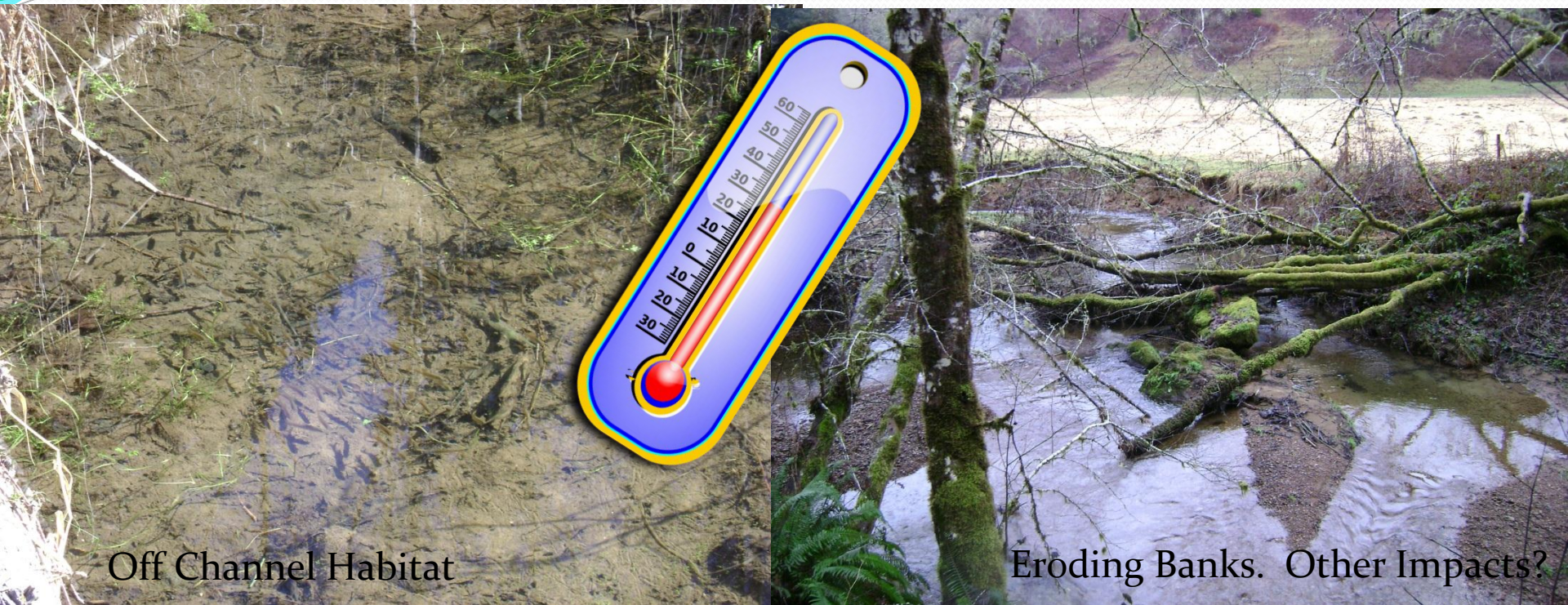


Spawning





# Figure out Why!



Off Channel Habitat

Eroding Banks. Other Impacts?

## Planning Resources –

- <http://midcoastwatershedscouncil.org/images/assessment/limiting-factors/Methodology.pdf>
- <http://wdfw.wa.gov/publications/o1374/wdfwo1374.pdf>
- <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/econ/?cid=stelprdb1044707>



# Figure Out What



- What is feasible?
- Dollars Available
  - Scale/Ability
  - Disturbance/Risk

Feedback loop with  
Where and Why!



# Figure out How!

Someone else has likely been here before!

Bring their knowledge to your project!

Luna Leopold

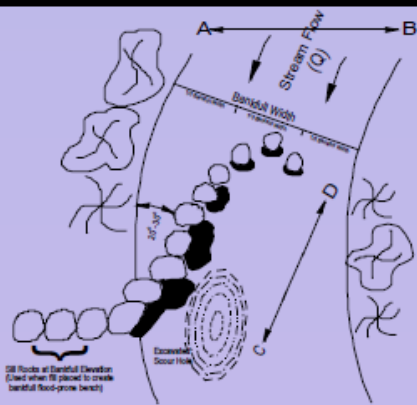
Dave Rosgen

Gordon Wolman

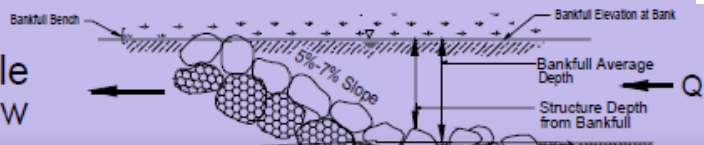
Gordon Grant

Google!

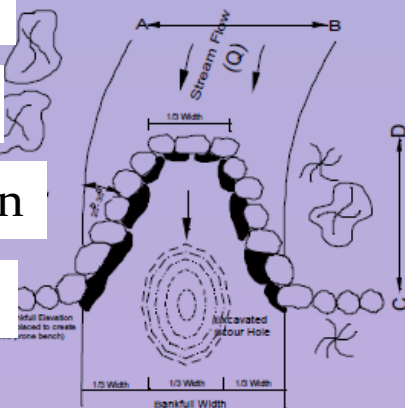
Plan View



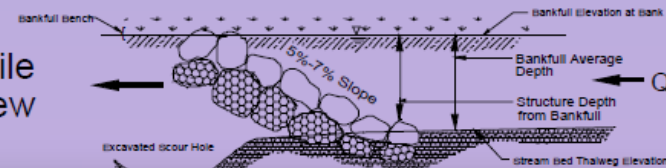
Profile View



Plan View

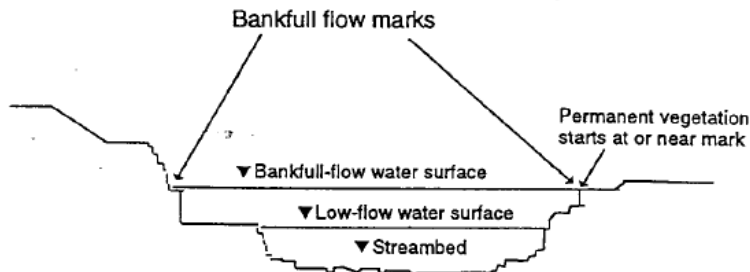


Profile View



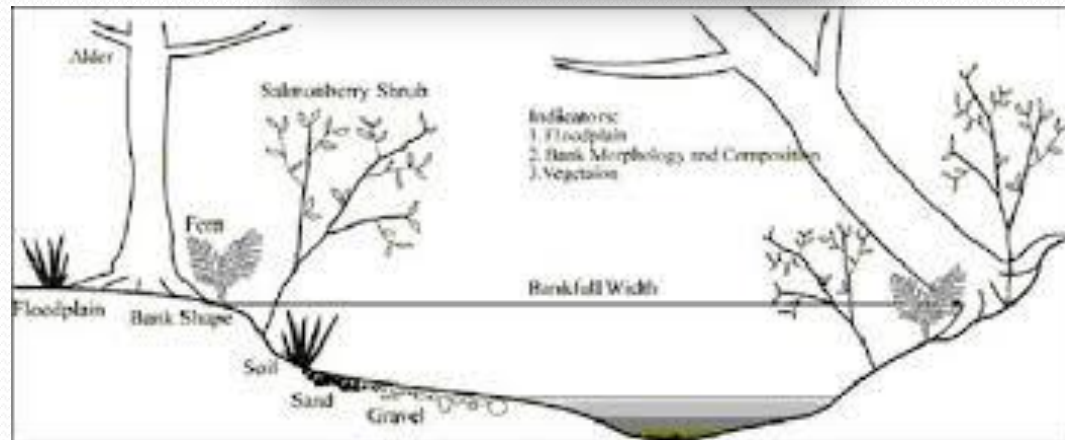
For any ground disturbing stream restoration project

# Know Bankfull!



Calculating Bankfull?  
Castro-Jackson (2001)  
 $W = 11.8DA^{0.38}$

Where DA="drainage area" in square miles.



Function over form!

Designs must incorporate bankfull dimensions, or design to compensate, or accept risk!



# Designing a Project



Logs are  
pinned above  
the stream!

Rebar

Nothing beats experience!



Not the Plan!

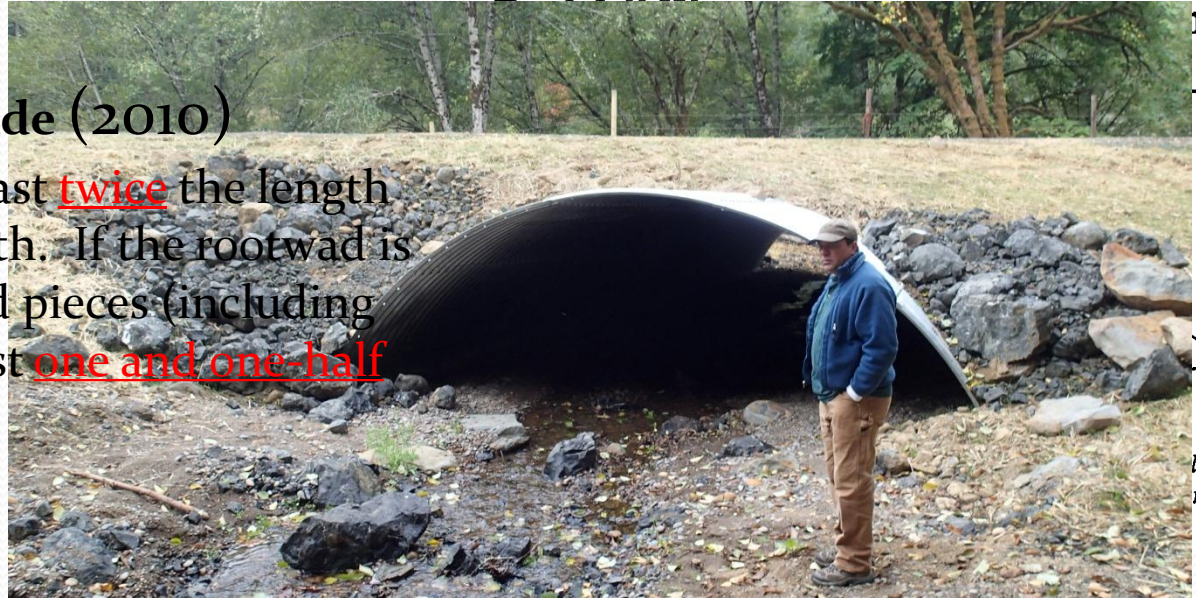
Know your goal!  
Know reference condition!  
Risk factors in the project area?  
e.g. Headcuts, Houses, Bridges,  
Old slides, etc...



# Project Design Criteria - Guidance:

## ODFW Instream LWD Guide (2010)

“Debris pieces must be at least twice the length of the stream’s bankfull width. If the rootwad is still attached, then the wood pieces (including the rootwad) must be at least one and one-half times the bankfull width.”



**Stream Simulation:** An Ecological Approach to Providing Passage for Aquatic Organisms At Road-Stream Crossings. Forest Service and US Department of Transportation (2008)  
**Size culverts to 1.2 times the Bankfull width plus 2 feet!**

**Endangered Species Act** - Endangered fish or wildlife in your project area generally means compliance with specific Project Design Criteria:

- SLOPES is COE consultation triggered with DSL Notice in critical habitat,
- ARBO is USFS and BLM consultation triggered by federal Funding and/or Location

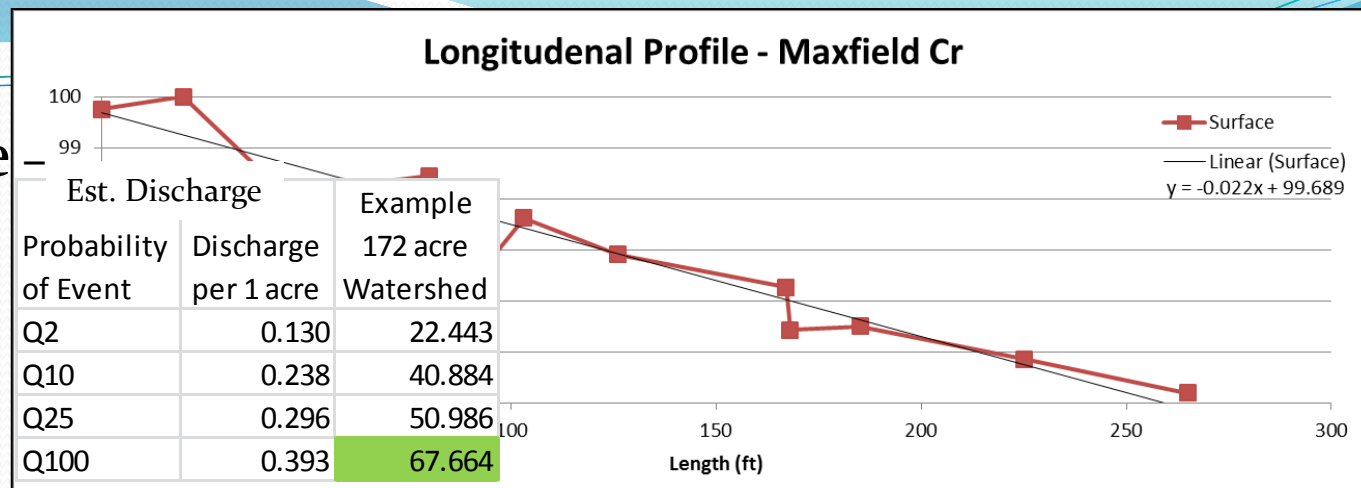
**Work with your federal and state partners!**



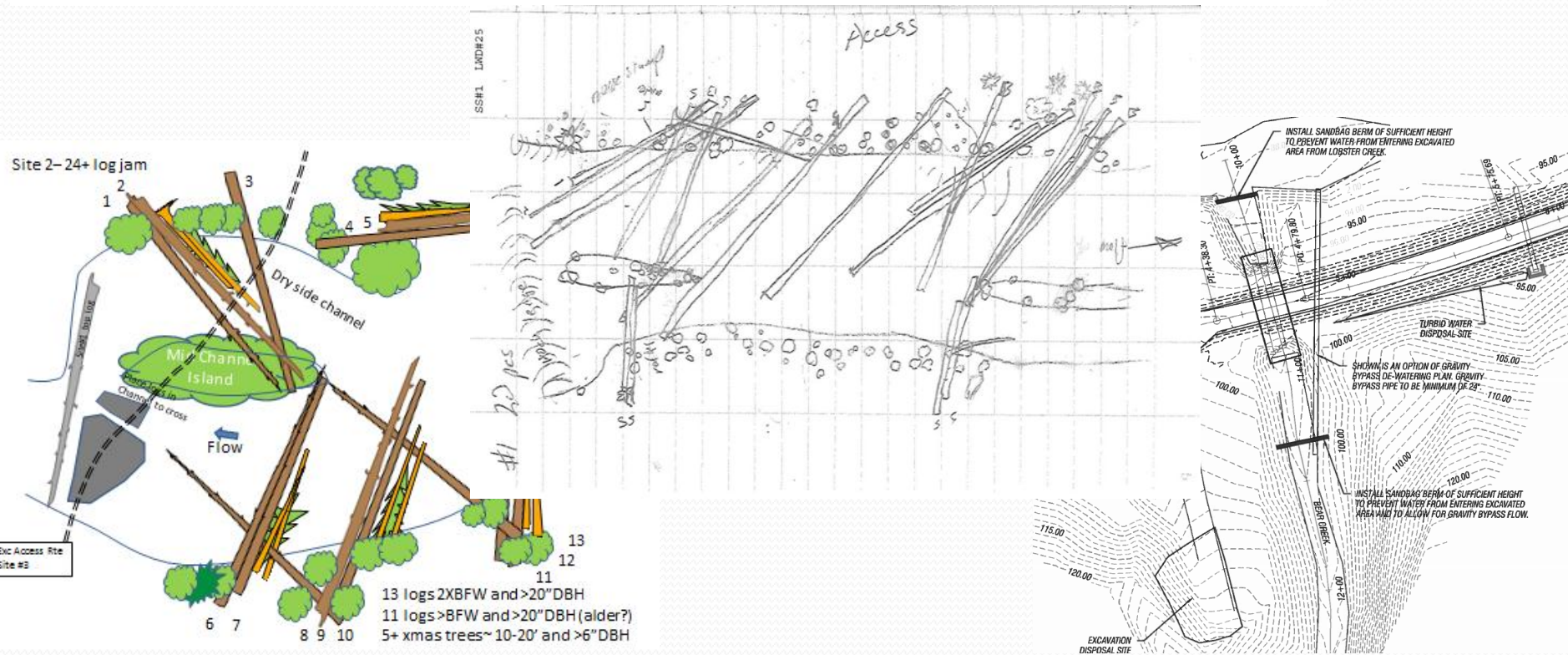
# Design Tools

## Measure/Calculate

- Bankfull width/depth
- Stream slope
- Pebbles (Probably)
- Discharge (Q)
  - a. Nearby Gauges
  - b. OWRD Calculator



## Drawings – Pencils and Rite-N-Rain Paper, Powerpoint, Autocad, etc...





# Funding Projects

## Cost Estimating:

- Review Similar Projects
- Ask Local Contractors
- US Bureau of Labor Statistics
- State Prevailing Wage Rates

## Grants/Agreements

### Federal



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Be Ready:  
Why Here?  
Why Now?

### Private



Meyer Memorial Trust

### State



OWEB

Plan your grant applications well  
in advance of project implementation



## Partnership- Start Early



## Contracts

Different rules for different organizations:

- Federal Govt has Federal Acquisition Regulations
- State Govt has ORS 279 Public Contracting Code
- Counties have their own rules
- Private has the most variety - handshake



# Permits! Permits! Permits!



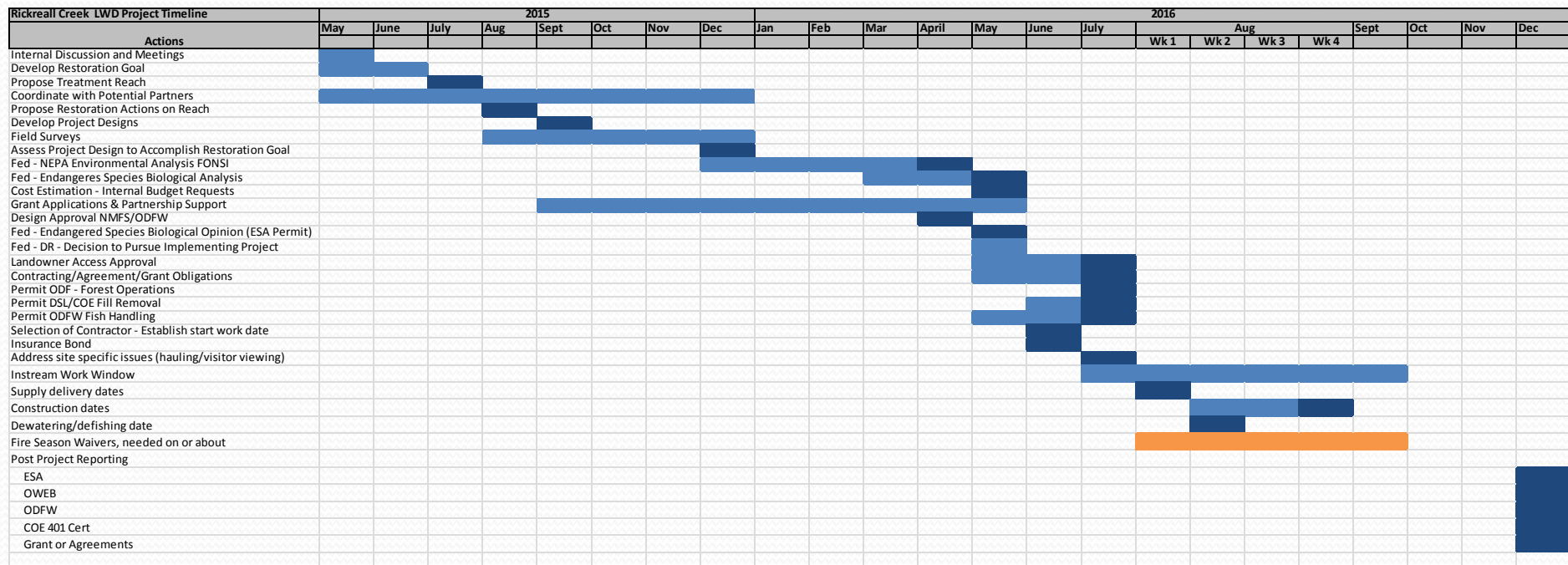
All ground disturbing work would require some kind of permit!  
A good place to start is notification to the **State of Oregon Stewardship Forester**.  
Plan notifications for your projects at least 3 months ahead of construction!  
6 months is better! Be flexible!!!!



# Figure out When

Timelines – manage for predictable limitations such as peak flows, in-water windows, grant cycles, and fire season!

On complex projects – Develop a Gant chart!



## Coordination and Communication

- Get everyone on the same plan!
- Check on other access issues (e.g. hauling).
- Interested public viewing sites?



# Time to Dig!

Contractors are not all equal:

- Do they have the right equipment?
- Do they have experienced operators?
- Are they over booked?
- Reference checks indicate good work?

Do a risk assessment of your project –

- low risk=little monitoring
- high risk=substantial monitoring

Make sure the contractor knows what you want before he starts digging.

Equipment

- Is all the equipment for the project available and on site when needed?
- Is the equipment big enough to move the materials?

Safety - Always know your refuge! Utilities! Traffic control!

CB's help!





## Supplies

- Obviously need culverts, logs, rocks, plants, etc...
- Not so obvious need straw, seed and sediment filters
- Critical - Stage everything where you'll need it!





Dewatering - Need a plan if there's water!





Don't forget the fish!





# Almost Done!

What is success? What can you learn for the next time?



Time to fill out those post project reports!



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**Durability:** Is the background condition stable or sustainable? Likely need to be back in 10 to 20 years.  
**MORE WOOD!!!!!!!!!!!!**