Integrated Planning - Engineering

NRCS Engineers
Application, Ranking, Offers, Restoration – One engineer’s opinion of timeline

- Engineering Schedule
  - Application phase, fast and furious, ~ 2 months
  - ACEP Team executes supplement (offers), ~ 6 months
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    - Assuming landowner accepts offer…

ACEP Team works their magic and easement is closed ~ 1 ½ yr
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  - Restoration completion, 3 yrs after Easement Closed
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NRCS Wetland Restoration (CPS 657)

PURPOSE:

To restore wetland function, value, habitat, diversity, and capacity to a close approximation of the predisturbance conditions by restoring:

- Conditions conducive to hydric soil maintenance.
- Wetland hydrology (dominant water source, hydroperiod, and hydrodynamics).
- Native hydrophytic vegetation (including the removal of undesired species, and/or seeding or planting of desired species).
- Original fish and wildlife habitats.
Planning Information needed

- Soils investigation (Soil Scientist)
  - Sedimentation depths / Depth to Bt (Playas)
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  - Sedimentation depths / Depth to Bt (Playas)
  - Depth to sand (Wet Meadows & River Sloughs)
  - Depth to ground water (Wet Meadows & River Sloughs)
  - Wetland delineation (Borrow or spoil areas)
Planning Information needed

- **Biological goals** (NRCS Team Lead, Ducks Unlimited, FWS, NGPC, PF, …)
  - Wetland Complex / Type / Historical Function
    - Restoring Vegetation
    - Tree & brush removal
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  - Wetland Complex / Type / Historical Function
    - Restoring Vegetation
    - Tree & brush removal
  - Inundation depths, hydroperiods, saturated vs inundated areas
    - Restoring Hydrology
Planning Information needed

- **Engineering Evaluation**
  - GIS
    - Aerials & LiDAR + Soils
  - Hydrologic data
    - Water budgets (spreadsheets, SPAW, EFH-2, WETS Tables)
  - Hydraulic analysis
    - USGS stream gauge data, HEC-RAS, Mannings Eqn, Groundwater
Planning Information

- Engineering Evaluation
  - Layer stack

Elevation

Vegetation

Slope

Soils

Result
Hydrologic Data - SPAW

Precipitation

Wetland Water Budget

Depth 12", Watershed:Wetland ratio 0:1
Application Phase – Preliminary Design

• Evaluating Alternatives (Feasibility)
  ◦ Stakeholder Objectives vs Program vs Cost $ for full restoration
Application Phase – Preliminary Design

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  - Stakeholder Objectives vs Program vs Cost $ for full restoration
  - Impacts to neighbors
    - Flooding (overland) or Lateral Effects (groundwater)
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  - Permitting
  - Constructability
Preliminary Design

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  - Soils and depth to Bt
  - Topography
  - Restoration limits & quantities
  - Grazing infrastructure
  - Notes, issues, concerns, challenges
Preliminary Design

- Engineering Deliverables
  - Preliminary plans and cost estimate
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Questions?