Floodplains Reimagined: Advisory Committee Meeting

Agenda / Presentation Overview

- **Project Schedule / Timeline**
  - Where we are now and where we are going
- **Scenario Development Process**
- **Scenario Development**
  - Suite of potential actions
  - Preliminary inundation results
  - Preliminary habitat suitability results
- **Managed Wetlands and Waterfowl Hunting Metrics**
  - See separate slide deck

Scenario Development Needs

3/30 Ad Hoc Outcomes Needed: feedback on pre-screening of key actions

4/18 AC & 4/26 SC Outcomes Needed: feedback on refined key actions and habitat suitability results

5/12 AC & 5/24 SC Outcomes Needed: feedback on river notch actions and habitat suitability results

Steering Committee

3/22	4/26	5/24	6/28	7/26	8/23	9/27	10/25	11/22
• Opp & Constraints Break Out Groups • Salmon Suitability • DU Scope of Work	• Scenario Dev Update • Habitat Suitability Outcomes • DU Scope of Work	• Scenario Dev Update • Managed Lands Metrics	• Multi-Benefit Analysis Approach • Salmon Productivity					

Advisory Committee

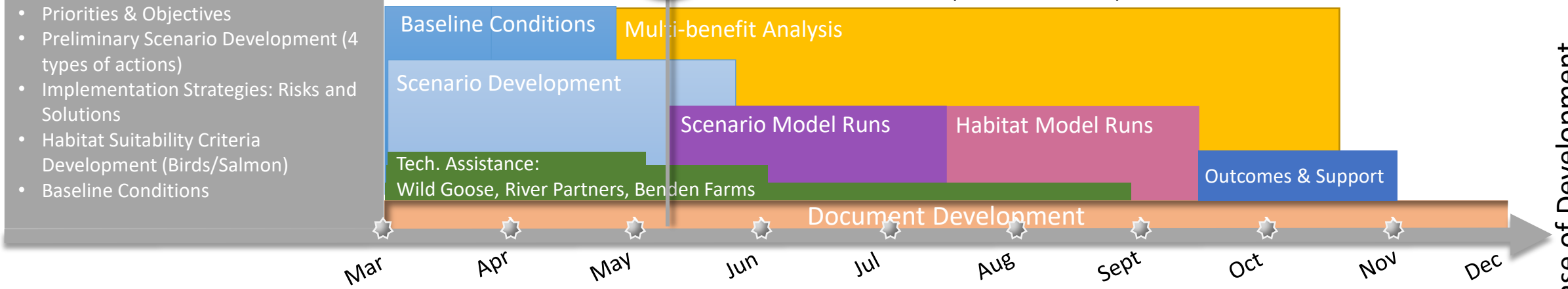
3/22	4/18	5/12	6/9 (change to 6/2 or 16)	8/11	10/13
	• Scenario Dev Update • Habitat Suitability Outcomes	• Scenario Dev Update • Managed Lands Metrics	• Multi-Benefit Analysis Approach • Salmon Productivity		

We are Here

--Scenario Development Ad Hoc, 3/30
--Managed Lands Ad Hoc, 4/28
--Salmon Productivity Coordination, May

Discussed To-Date

- Priorities & Objectives
- Preliminary Scenario Development (4 types of actions)
- Implementation Strategies: Risks and Solutions
- Habitat Suitability Criteria Development (Birds/Salmon)
- Baseline Conditions



Next Phase of Development

Feasibility: Is there potential for species benefit but more information is needed?

Scenario Development Process

Develop Potential Actions

- Stakeholder/Landowner input (…4th action type added)
- Technical team input

Pre-Screen Potential Actions (we are here)

- Test the hydrologic feasibility of key actions (…where is the water and for how long)

Develop Potential Grouping of Actions

- Combine actions (…and share out at upcoming AC meetings)
- Apply scenarios regionally (…and identify hydrologic opportunities and constraints)

Evaluate Scenarios

- Evaluate relative changes (scenario vs baseline) over multiple water years
- Perform multi-benefit analysis
- Assess landowner willingness

Scenario Development – Suite of Possible Actions

Types

- River Connections
  - Notch overflow and flood weirs
  - Modify outfall gates
  - Modify existing or add new diversions
  - With or without fish screens
- Floodplain Infrastructure
- Land Management
- Habitat Restoration

Fremont Weir Adult Fish Passage (credit: DWR)

Scenario Development – Suite of Possible Actions

Types

- River Connections
- Floodplain Infrastructure
  - Modify water management
  - Improve fish passage
- Land Management
- Habitat Restoration

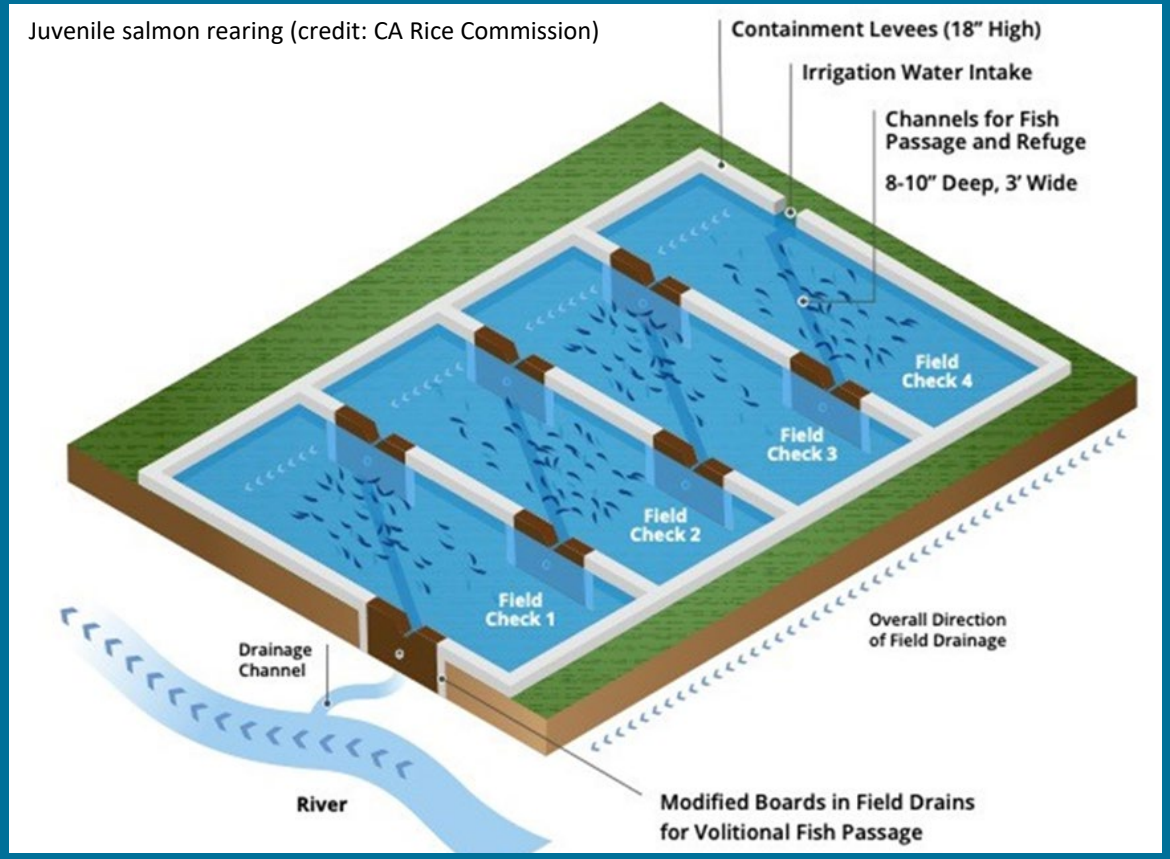
Gorrill Fish Screen and Ladder Project (credit: Gorrill Ranch)

Scenario Development – Suite of Possible Actions

Types

- River Connections
- Floodplain Infrastructure
- Land Management
  - Manage water on the field unit
    - Juvenile salmon rearing & fish food
    - Bird habitat
    - Groundwater recharge
  - Fish friendly passage
  - Fish screens
- Habitat Restoration

Juvenile salmon rearing (credit: CA Rice Commission)



Scenario Development – Suite of Possible Actions

Types

- River Connections
- Floodplain Infrastructure
- Land Management
- Habitat Restoration
  - Juvenile rearing
  - Reduce stranding
  - Riparian restoration

Willow Bend Preserve (credit: this study)

Feedback & Model History

Model History

- Both Basins – Baseline
  - 2019 Inundation Animations and Calibration
- Butte Basin Actions – Moulton and Colusa Notches
  - Depth difference and habitat analysis

- Colusa Basin Actions – Colusa Drain Flow and Management
  - Depth difference and habitat analysis

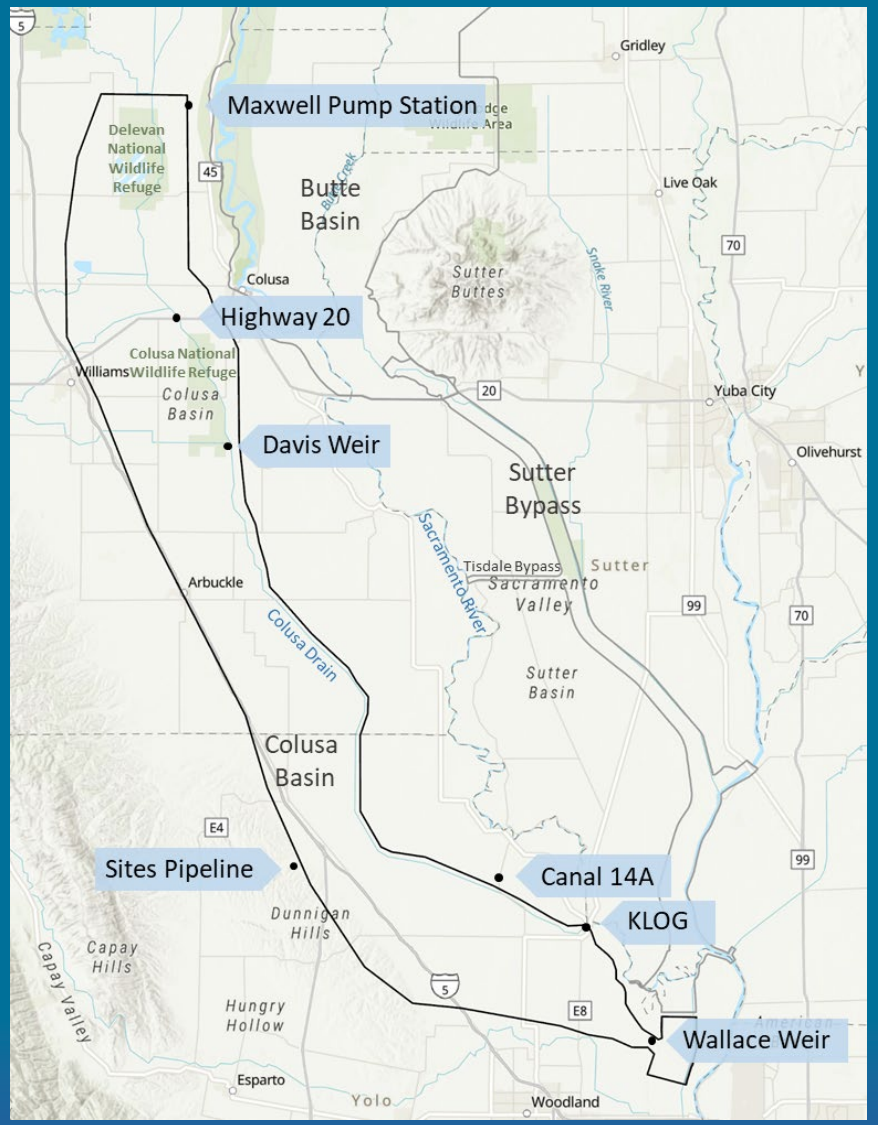
Scenario Development – Suite of Possible Actions

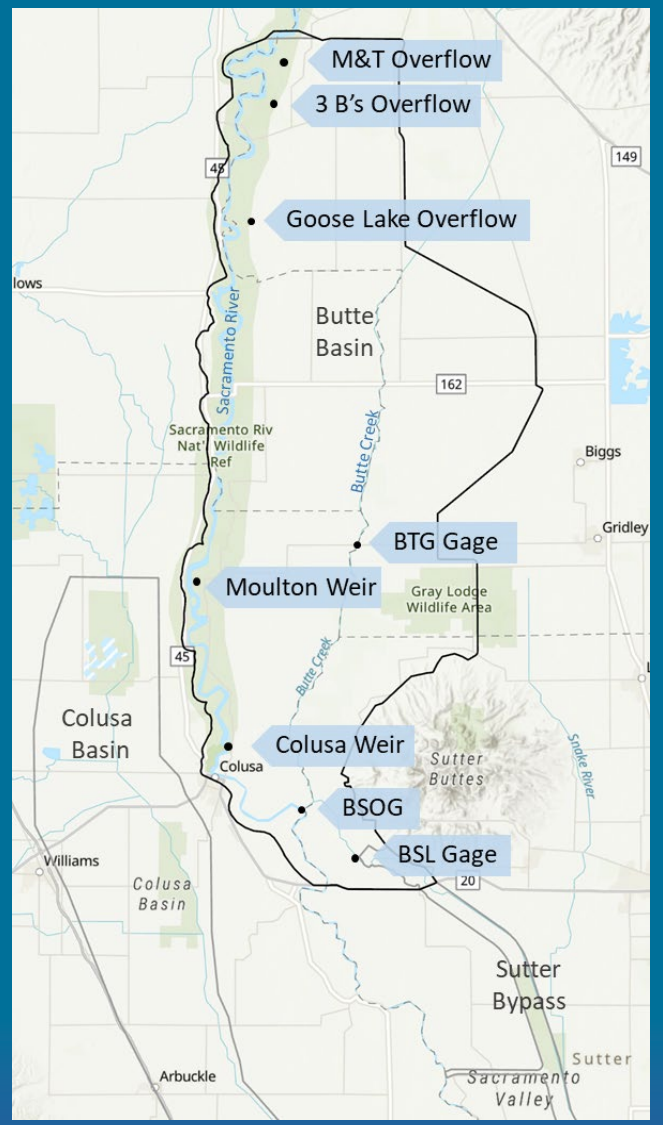
Actions are Preliminary!!!

- Actions require willingness
- Actions require evaluation
  - Are they feasible?
  - Are they beneficial?
  - Do they impact existing uses?
  - Do they impact other projects?

Actions to be Discussed Today

- River Connections
  - Moulton & Colusa Weir Notch
  - Colusa Basin Notch
- Floodplain Infrastructure
  - Wallace Weir & KLOG
  - Davis Weir





Recommended River Connection Notch Actions

Does the Advisory Committee support the proposed recommendation to the Steering Committee to run full feasibility analysis for 2000 cfs river connection actions?

Current Simulated Actions - X Recommended Flow for Notch Actions - **X**					
Basin	Action	1000 cfs	2000 cfs	3000 cfs	6000 cfs
Butte	Moulton Weir Notch	X	**X**	X	X
Butte	Colusa Weir Notch	X	**X**	X	X
Butte	Moulton and Colusa Weir Notch Combination		**X**	X	
Colusa	Colusa Drain Notch & Higher Wallace Weir Management	X	**X**		

- Full Feasibility Analysis of Scenarios (Next Steps):
  - Run out key river connections for select water years
  - Layer on other potential actions to form scenarios
    - Floodplain infrastructure
    - Land Management
    - Habitat Restoration
  - Perform multi-benefit analysis and assess landowner willingness

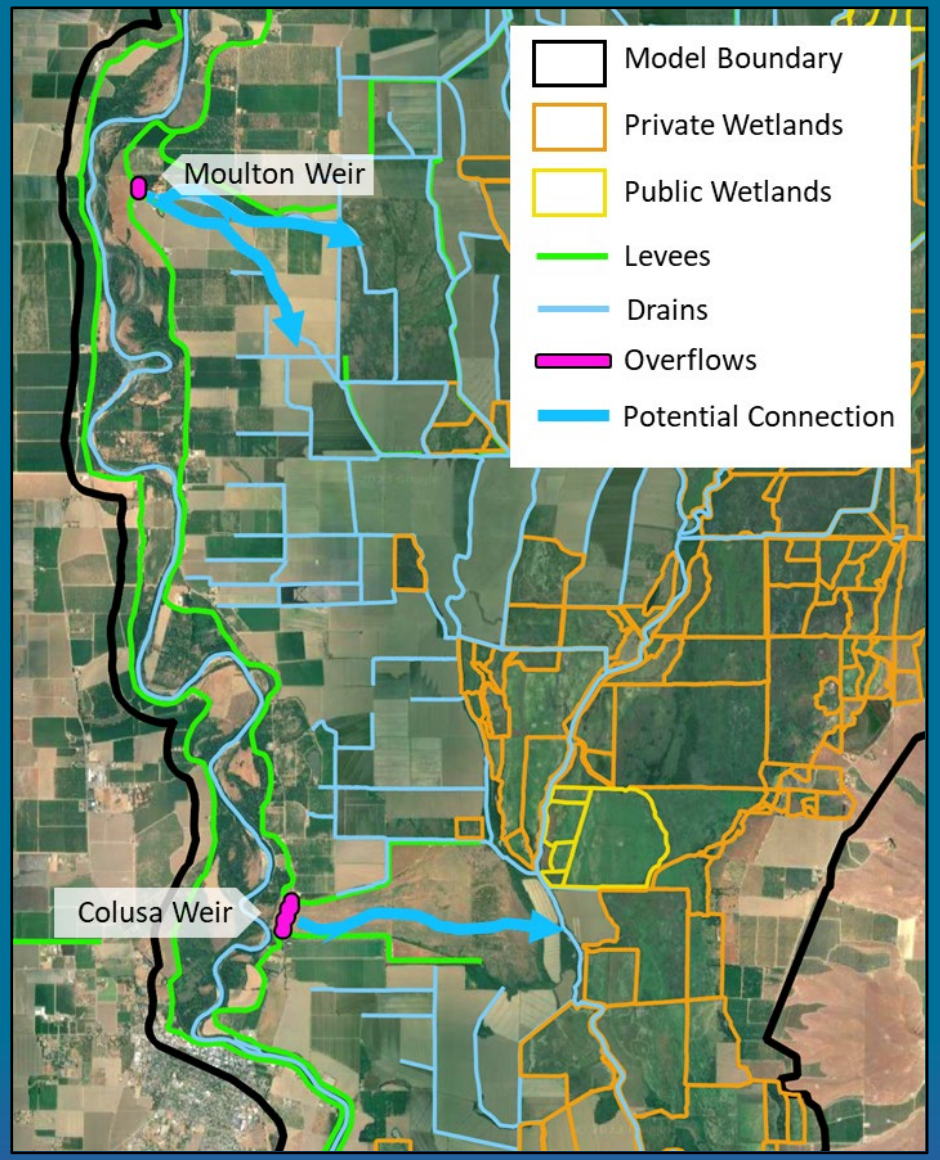
Butte Basin – Moulton and Colusa Weir Notch Action

Description

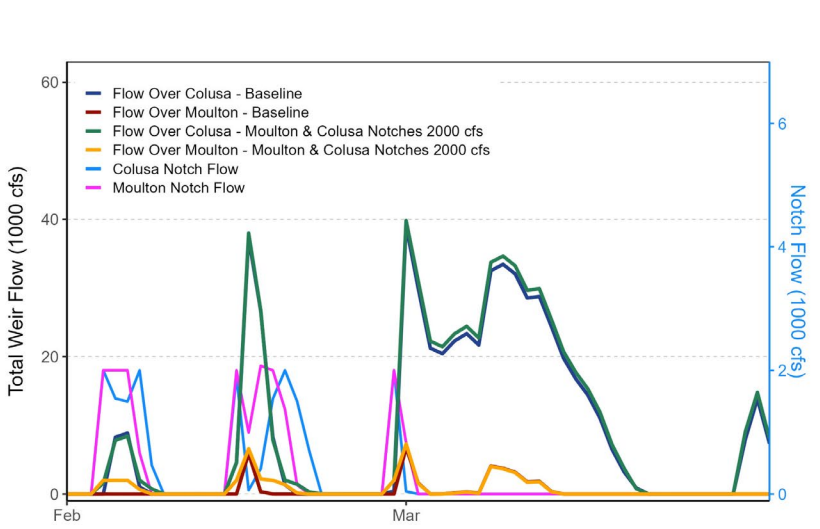
- Existing weirs:
  - Colusa overtops at 30,000 cfs and 61 ft
  - Moulton overtops at 60,000 cfs and 76 ft
- Operable notch:
  - Operational window: 11/1 to 3/1
  - Notch flows: max rates of 2000, 3000 cfs
  - Moulton Weir Notch
    - River stage range: 61 ft to 76 ft
    - River flow range: 18,000 cfs to 60,000 cfs
  - Colusa Weir Notch
    - River stage range: 50 ft to 61 ft
    - River flow range: 16,000 cfs to 30,000 cfs

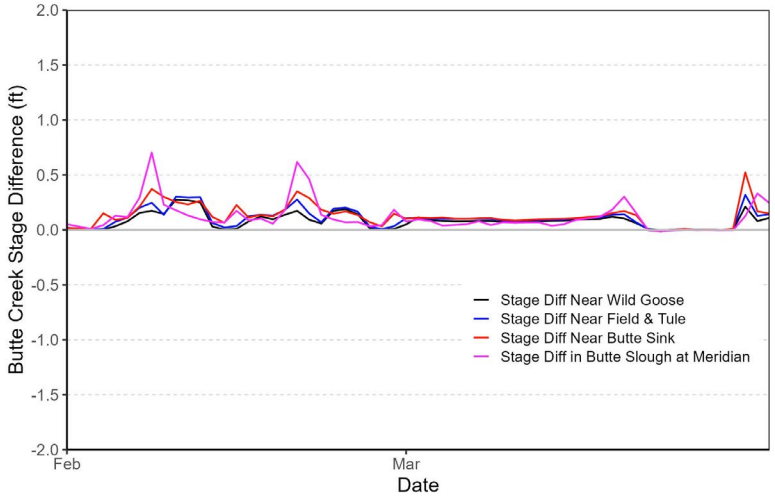
Question/Discussion

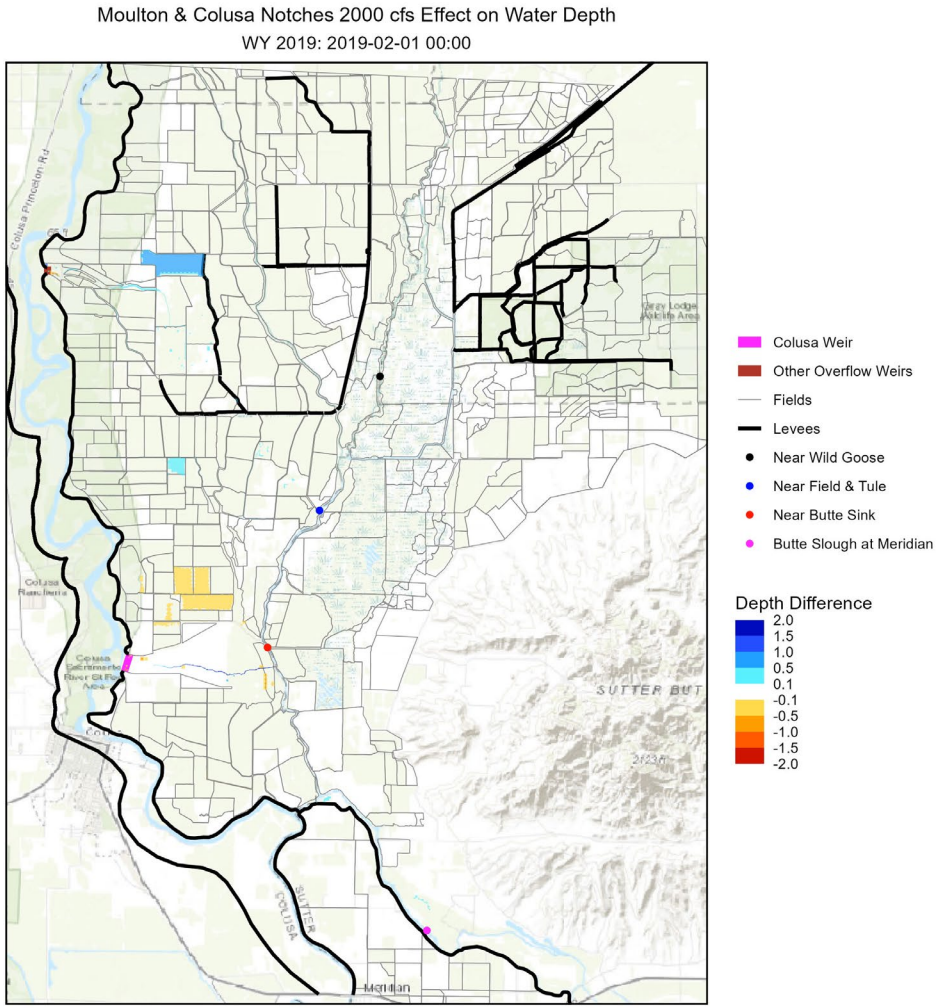
- Does the Advisory Committee recommend the 2000 cfs notch flow to the Steering Committee for full feasibility analysis?



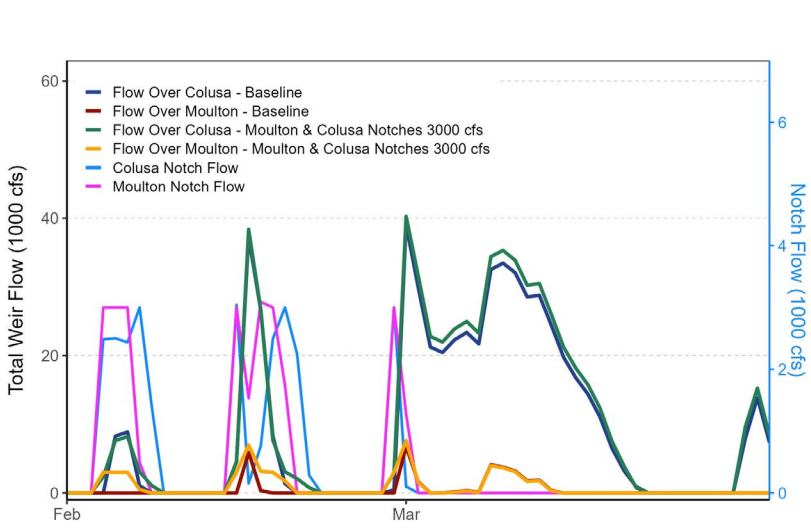
Butte Basin – Moulton and Colusa Weir Notch Action

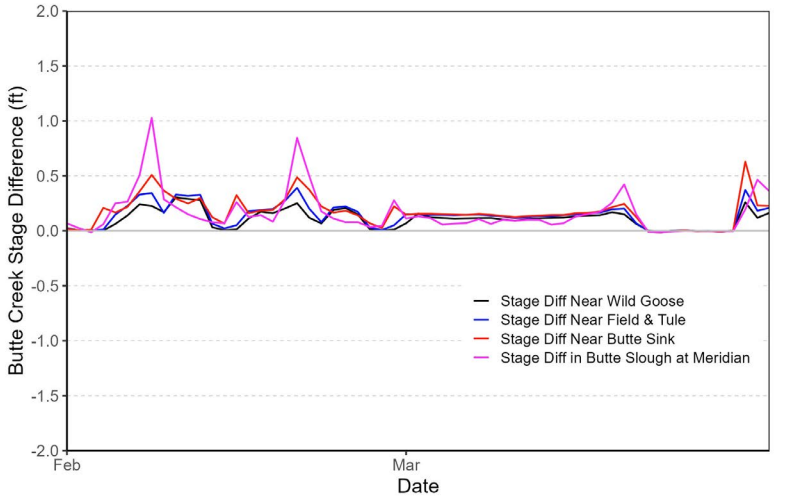


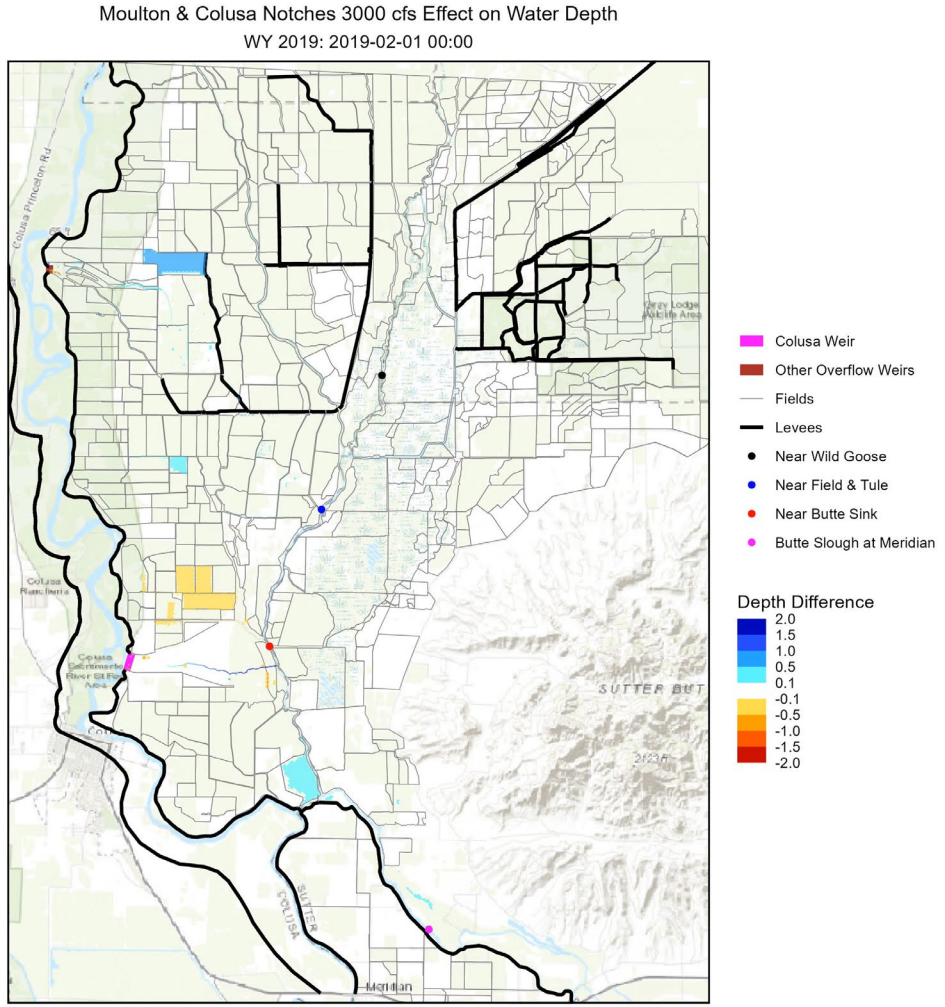




Butte Basin – Moulton and Colusa Weir Notch Action



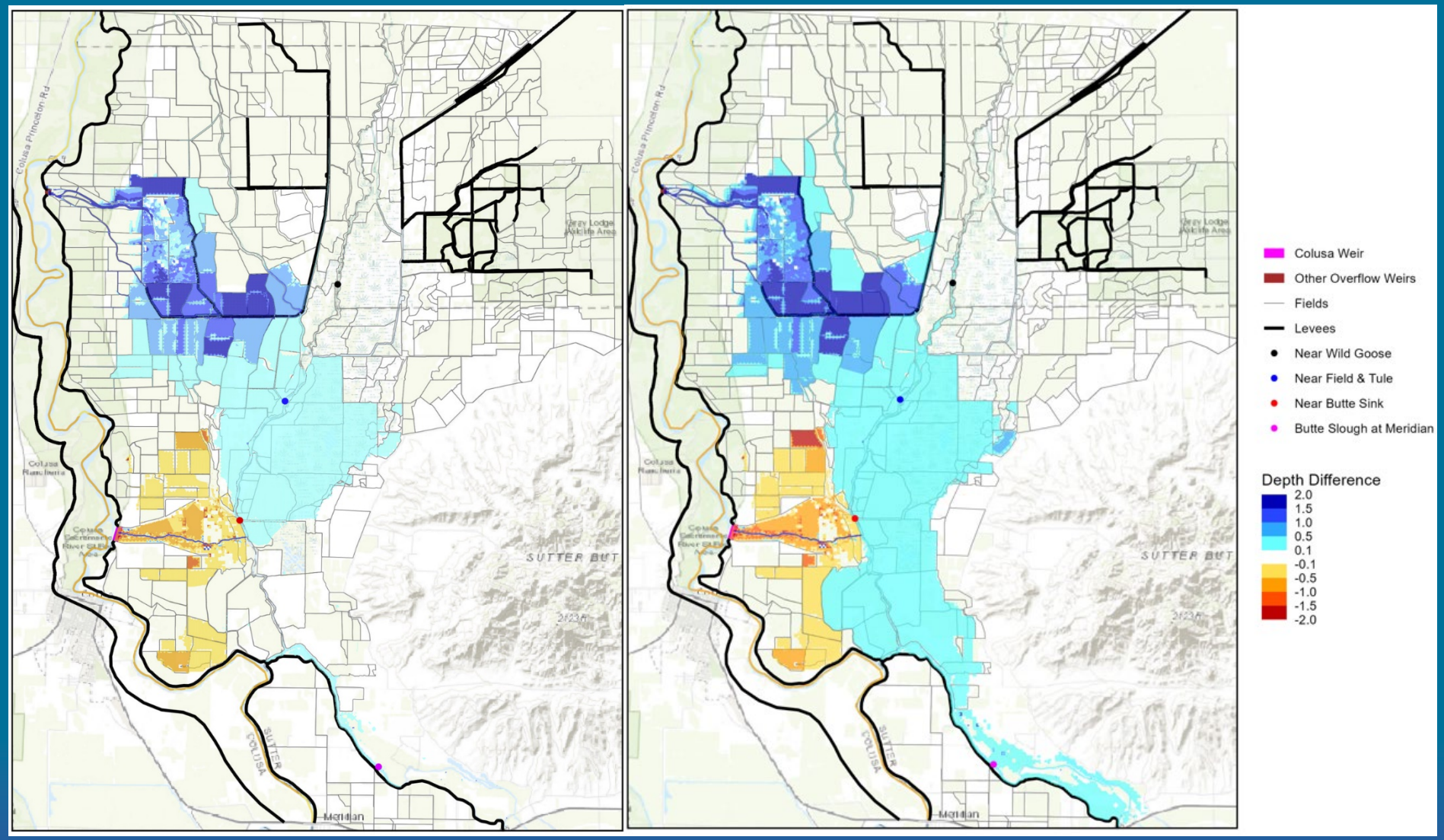




Butte Basin – Moulton and Colusa Weir Notch Action

2000 cfs

3000 cfs

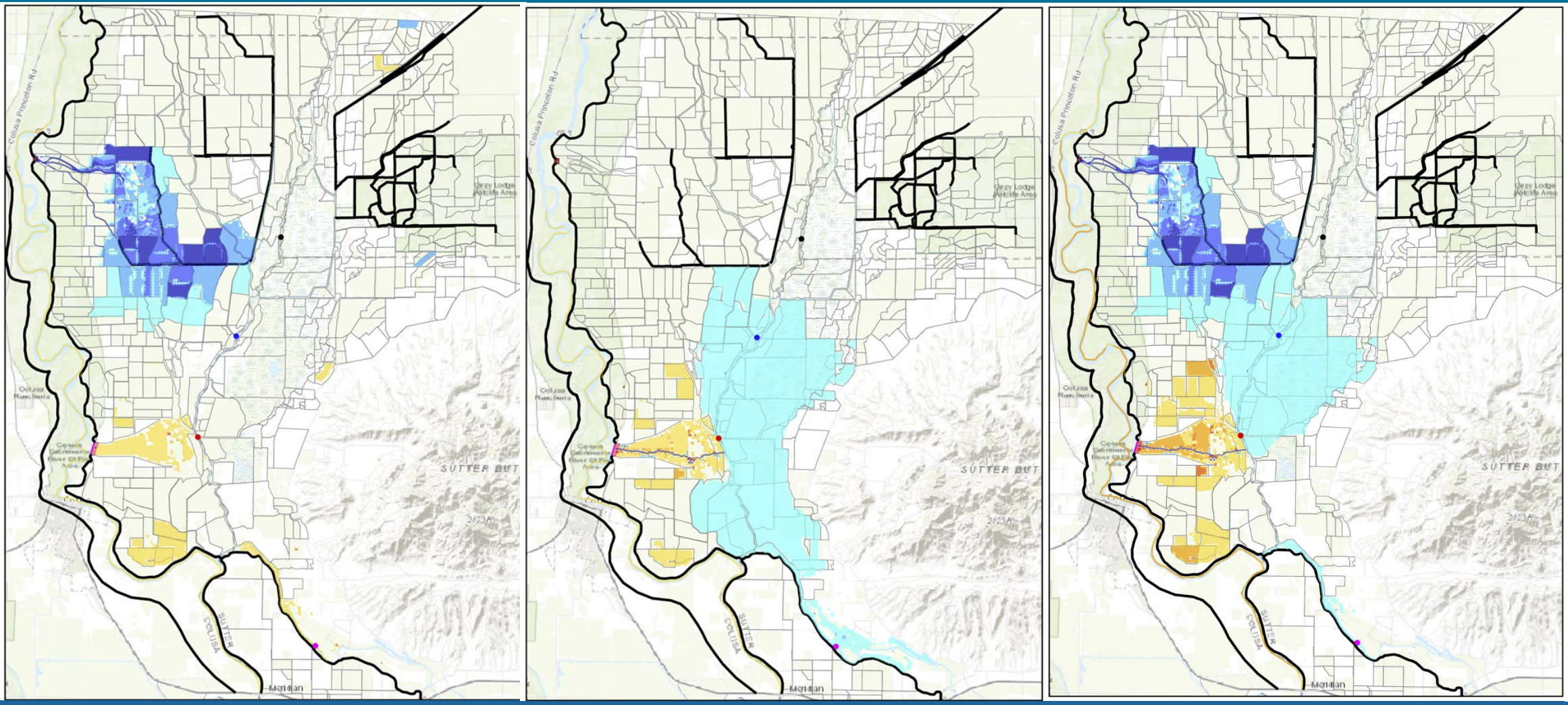


Butte Basin – 2000 cfs Notch Comparison

Moulton

Colusa

Both Notches

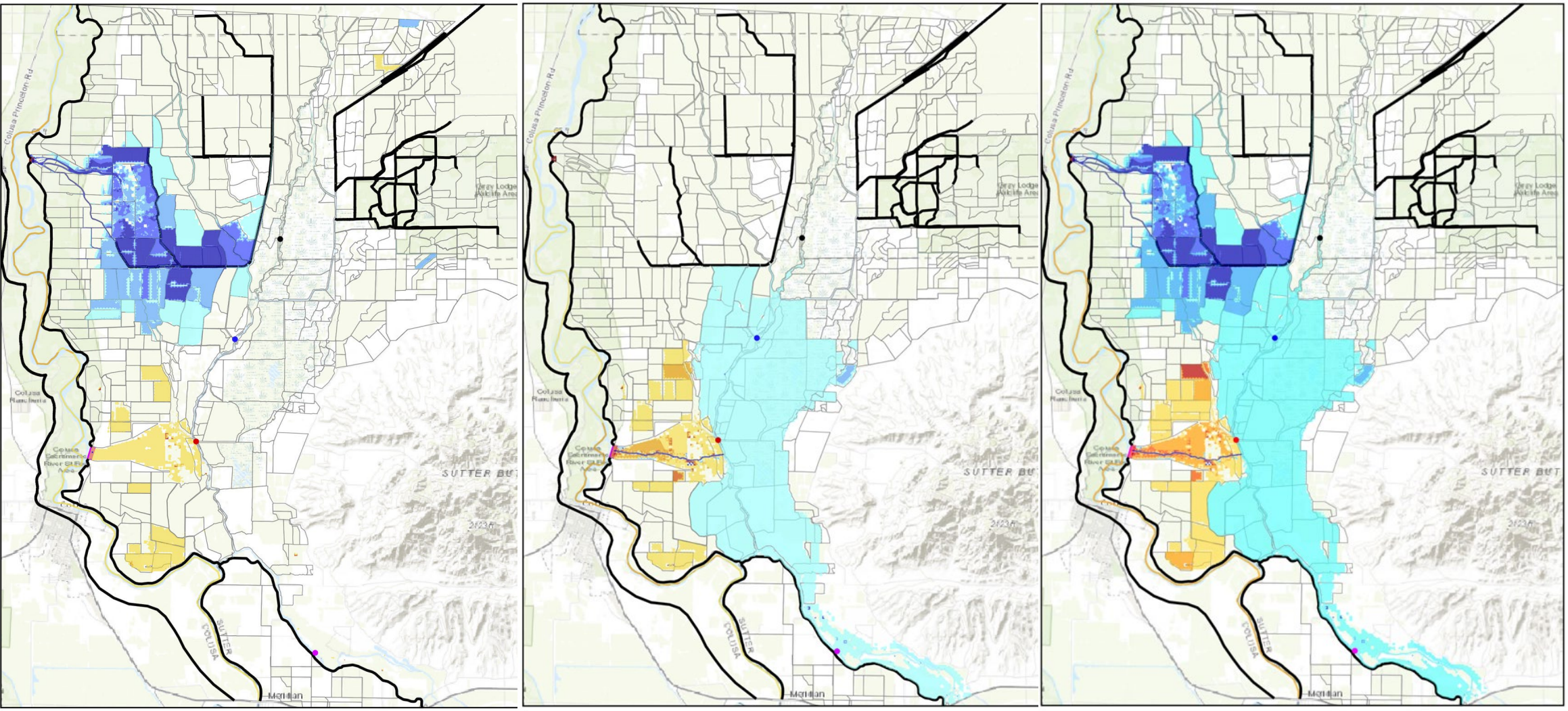


Butte Basin – 3000 cfs Notch Comparison

Moulton

Colusa

Both Notches



Salmon Habitat Suitability Criteria

Juvenile Salmon Criteria

- Timing
  - November 1 – June 30 (1)
- Duration
  - ≥14 days (1)
  - <14 days (0.66)
- Depth
  - > 0.9 ft (1)
  - 0.6 - 0.9 ft (0.66)
- Velocity
  - ≤1.5 ft/s (1)
- Connectivity
  - Natural areas hydraulically connected (1)
  - Managed fields connected through berm overtopping (1)
  - Managed fields connected through outlet structure (0.66)
- Landcover
  - Riparian/wetland/open water (1)
  - Rice/ Agriculture (0.66)

Bird Habitat Suitability Criteria

Waterfowl Criteria

- Timing
  - August 15 – March 31
- Depth
  - < 12 in
- Landcover
  - Managed Wetlands and Rice

Shorebird Criteria

- Timing
  - July 1 – May 15
- Depth
  - < 4 in
- Landcover
  - Managed Wetlands, Rice, Field and Row Crops

Sandhill Crane Roosting

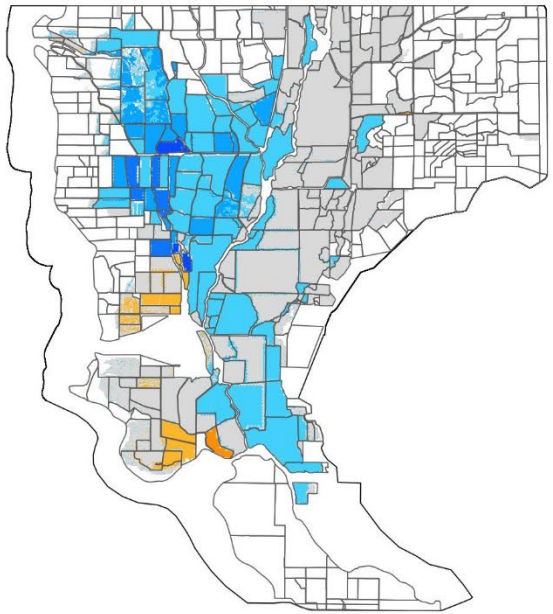
- Timing
  - October 1 – March 15
- Depth
  - < 8 in
- Landcover
  - Managed Wetlands, Rice, and Corn

Sandhill Crane Foraging

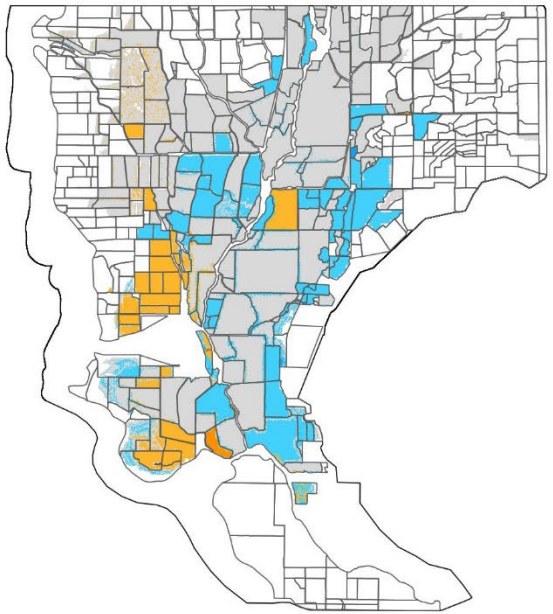
- Timing
  - October 1 – March 15
- Depth
  - < 2 in
- Landcover
  - Wetlands or annual crops within 5km of known roost

Salmon Habitat Suitability – Difference in Total WUA

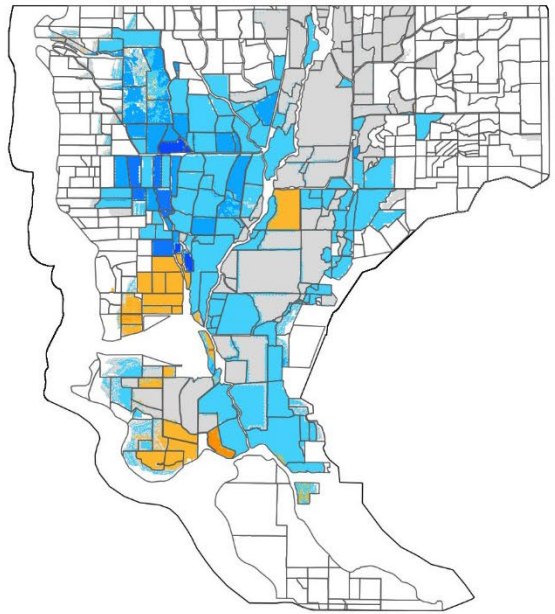
Moulton Notch
2000 cfs Max

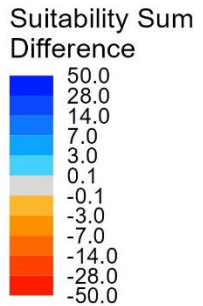


Colusa Notch
2000 cfs Max



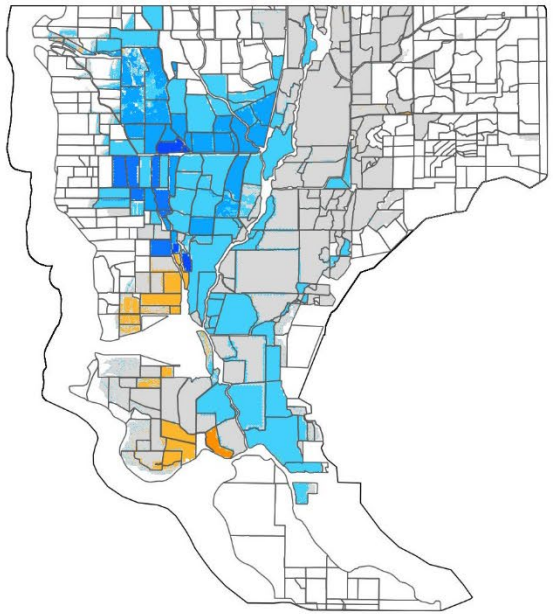
Both Notches
2000 cfs Max



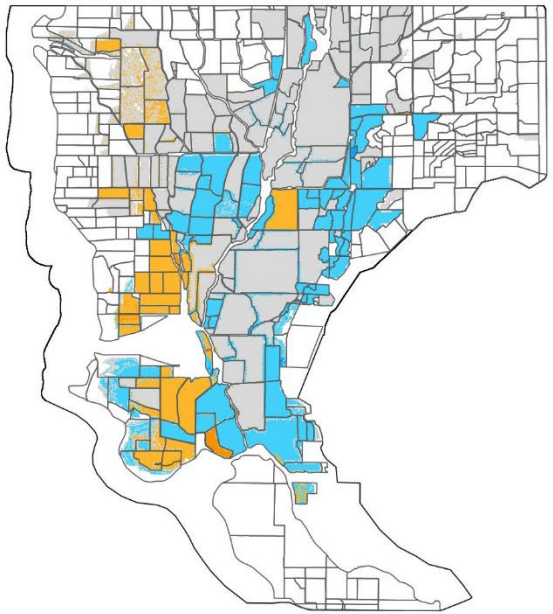


Salmon Habitat Suitability – Difference in Total WUA

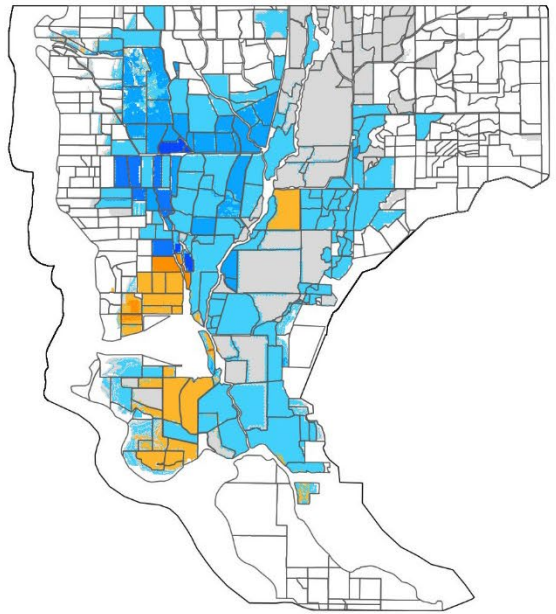
Moulton Notch
3000 cfs Max

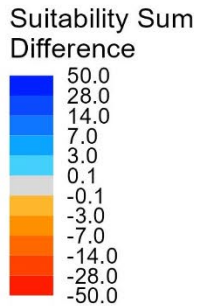


Colusa Notch
3000 cfs Max



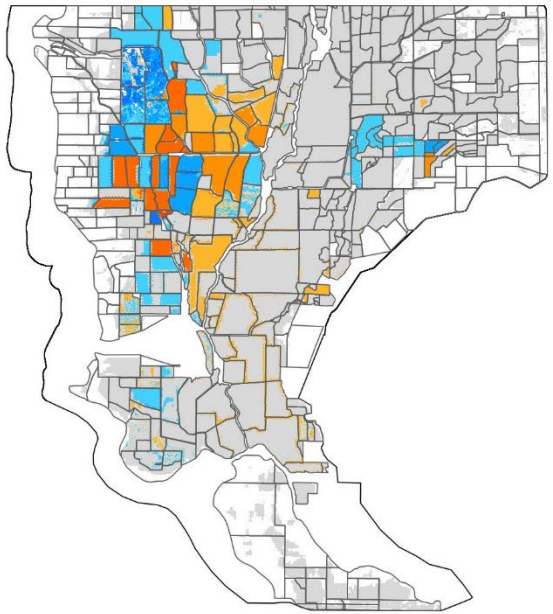
Both Notches
3000 cfs Max



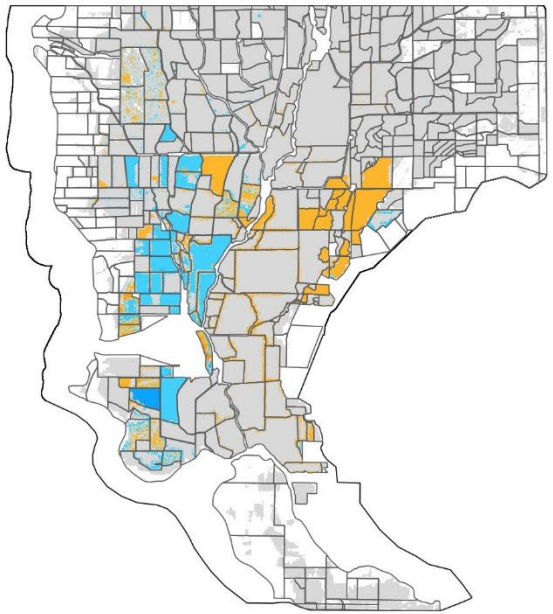


Waterfowl Habitat Suitability – Difference in Total WUA

Moulton Notch
2000 cfs Max



Colusa Notch
2000 cfs Max



Both Notches
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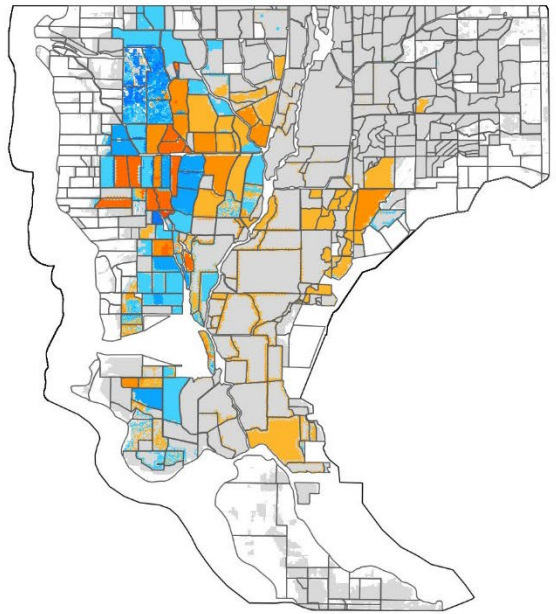
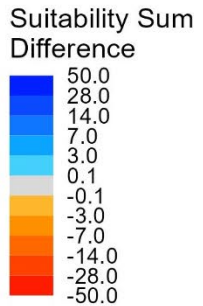
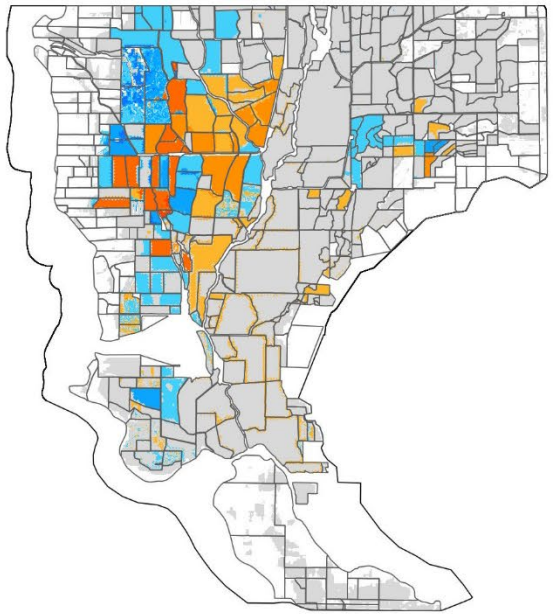


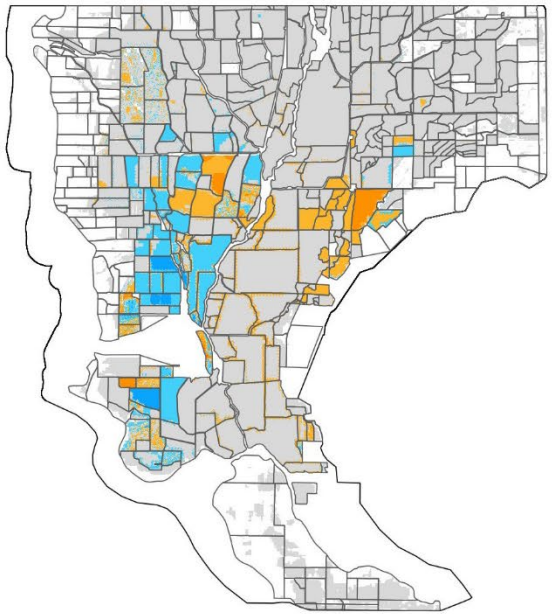


Waterfowl Habitat Suitability – Difference in Total WUA

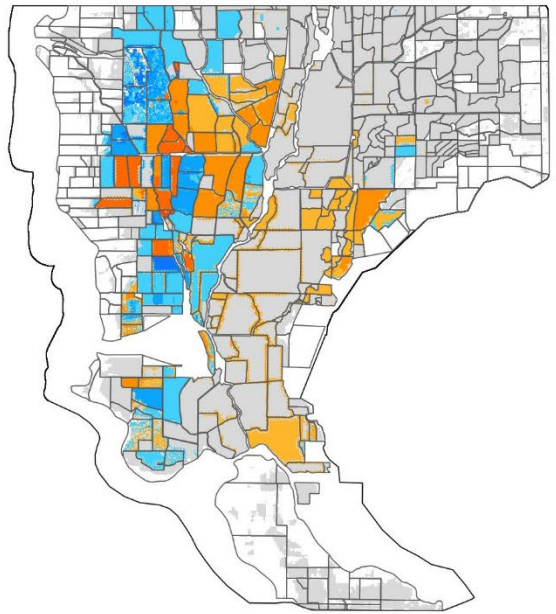
Moulton Notch
3000 cfs Max

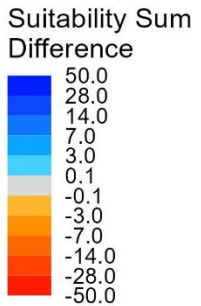


Colusa Notch
3000 cfs Max



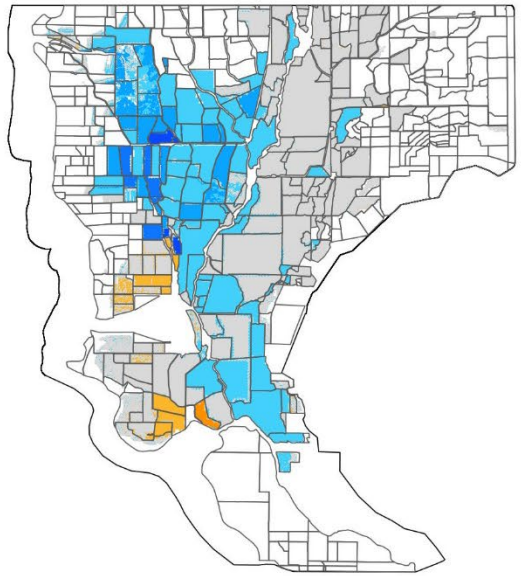
Both Notches
3000 cfs Max





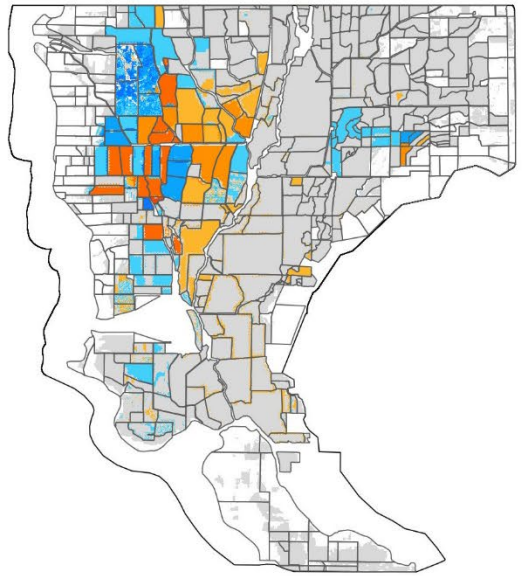
Habitat Suitability – Waterfowl and Juvenile Salmon Tradeoffs

Salmon
Moulton Notch
2000 cfs Max



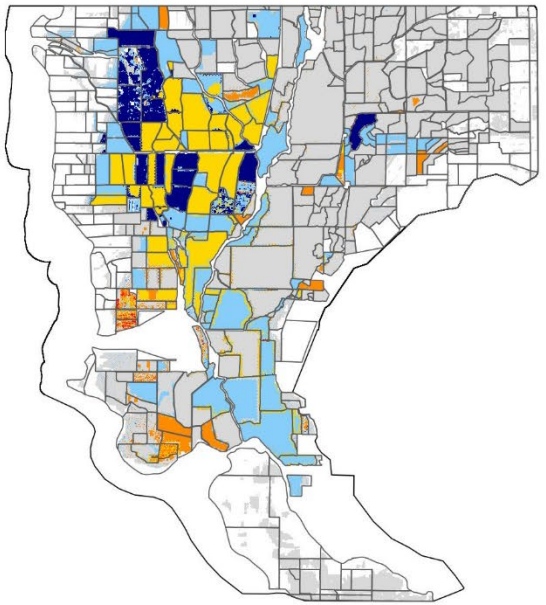
Suitability Sum Difference
50.0
28.0
14.0
7.0
3.0
0.1
-0.1
-3.0
-7.0
-14.0
-28.0
-50.0

Waterfowl
Moulton Notch
2000 cfs Max



Suitability Sum Difference
50.0
28.0
14.0
7.0
3.0
0.1
-0.1
-3.0
-7.0
-14.0
-28.0
-50.0

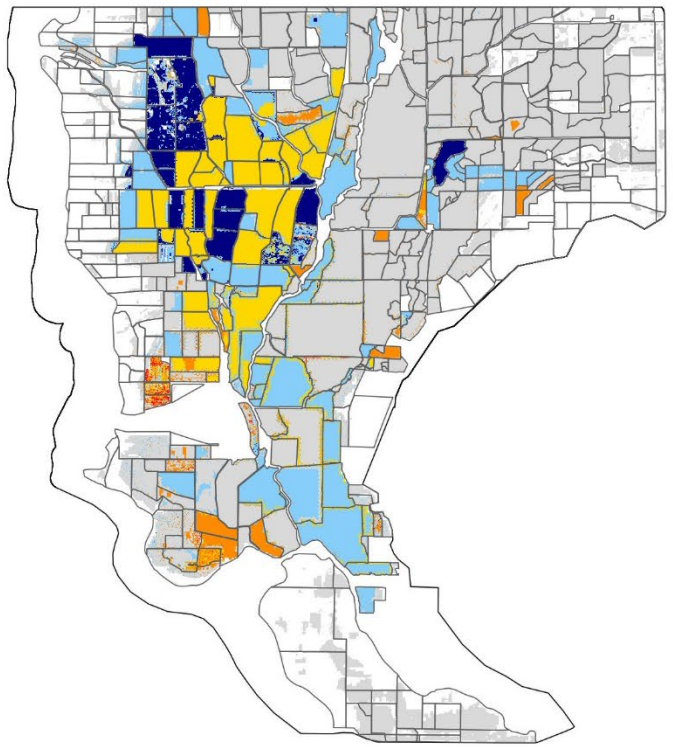
Moulton Notch
2000 cfs Max



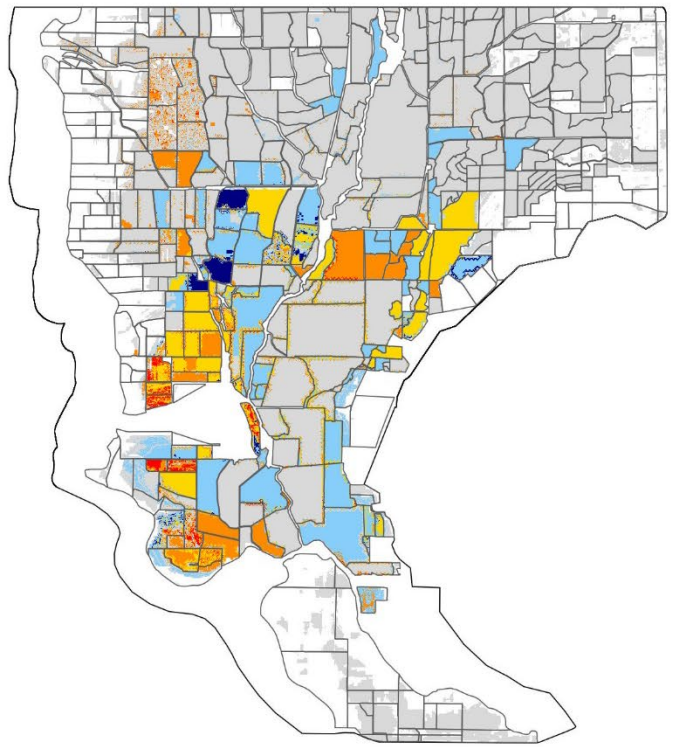
Salmon
+ 0 -
Waterfowl
+
0
-

Habitat Suitability – Waterfowl and Juvenile Salmon Tradeoffs

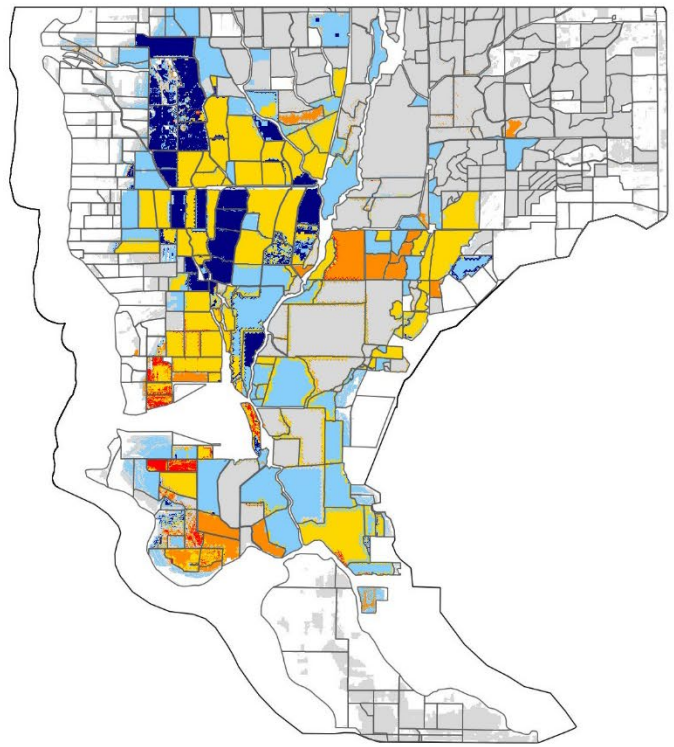
Moulton Notch
2000 cfs Max

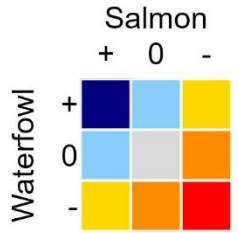


Colusa Notch
2000 cfs Max



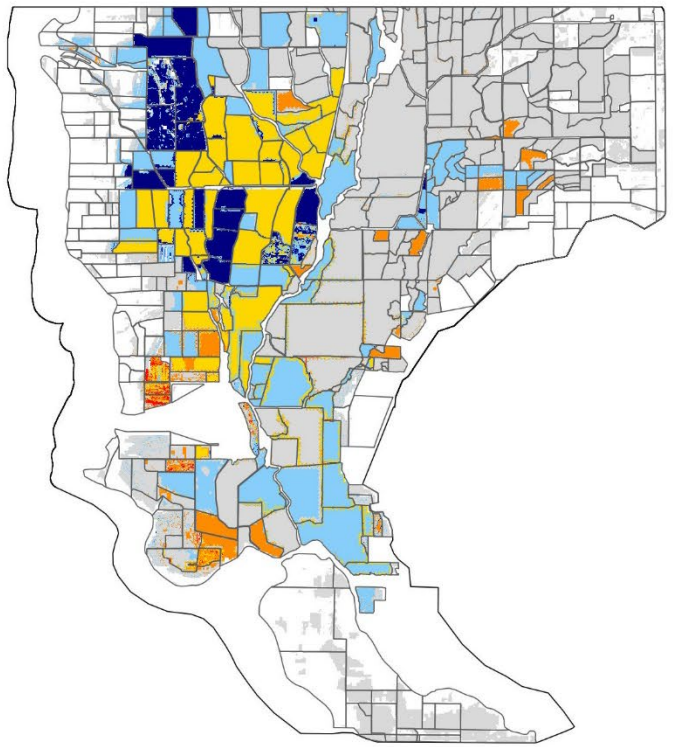
Both Notches
2000 cfs Max



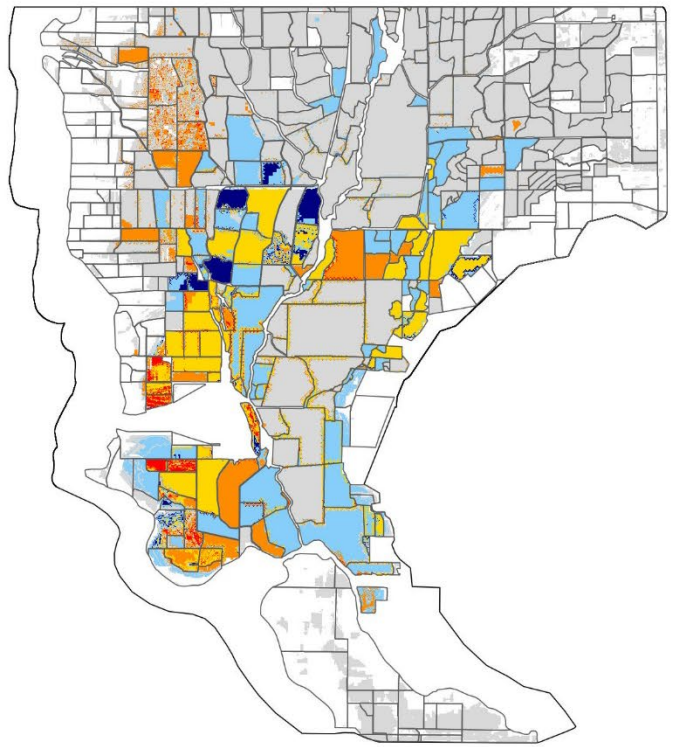


Habitat Suitability – Waterfowl and Juvenile Salmon Tradeoffs

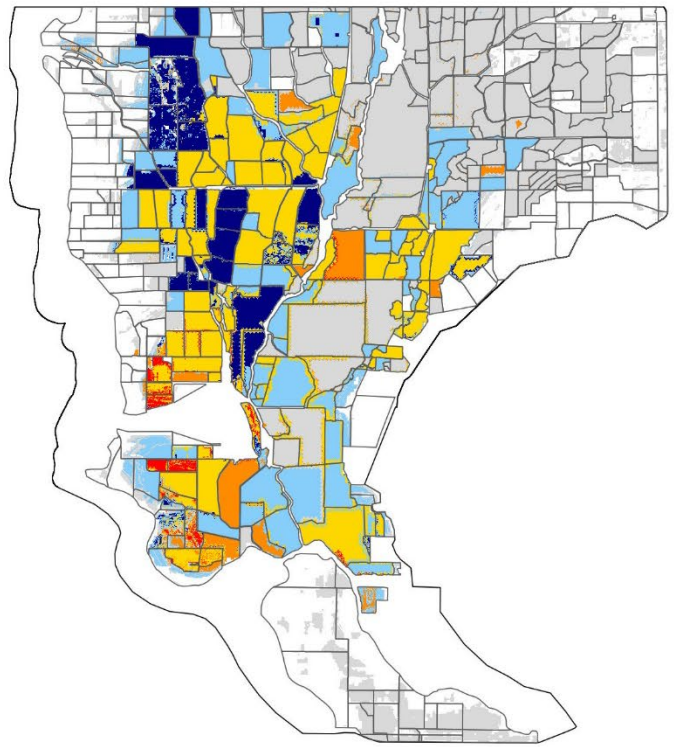
Moulton Notch
3000 cfs Max

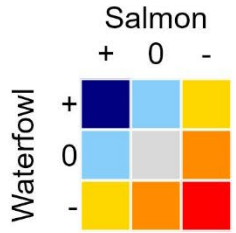


Colusa Notch
3000 cfs Max



Both Notches
3000 cfs Max





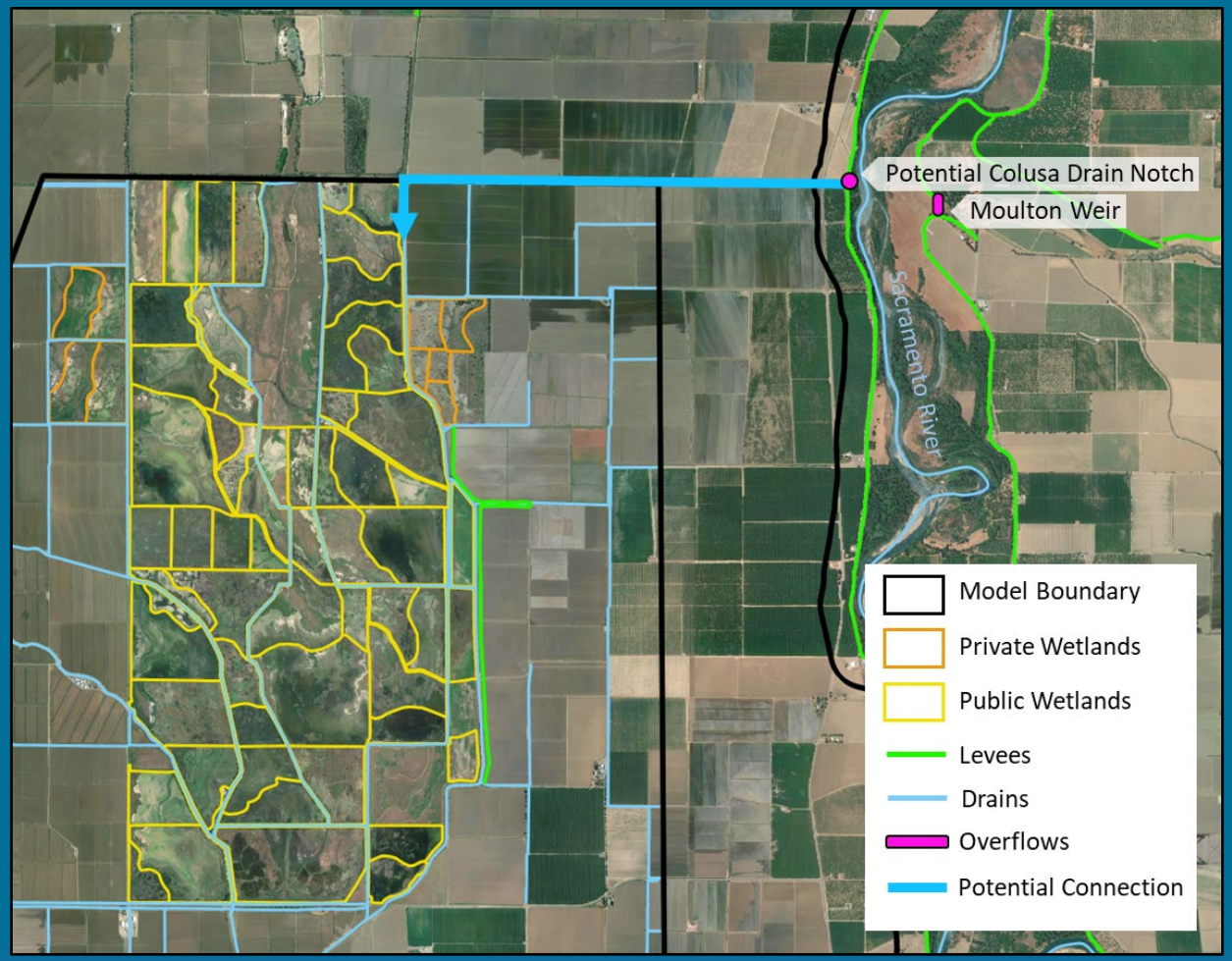
Colusa Basin – Sacramento River Notch and Water Management Level Testing

Description

- No existing weir
- Operable notch:
  - Operational window: 11/1 to 3/1
  - River stage range: 61 ft to 76 ft
  - River flow range: 18,000 cfs to 60,000 cfs
  - Notch flows: max rates of 1000, 2000 cfs
- Operable notch features:
  - Outlet: grade 15,000 ft channel

Question/Discussion

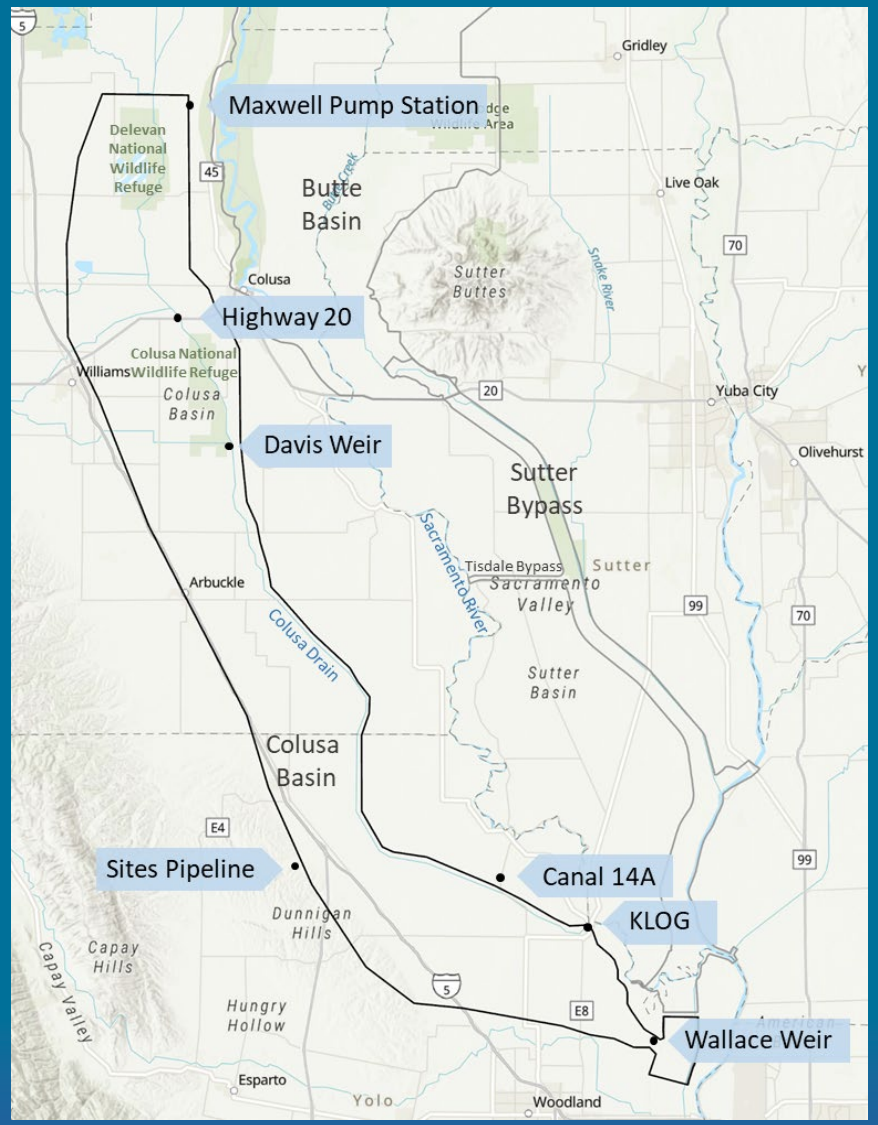
- Does the Advisory Committee recommend the 2000 cfs notch flow to the Steering Committee for full feasibility analysis?



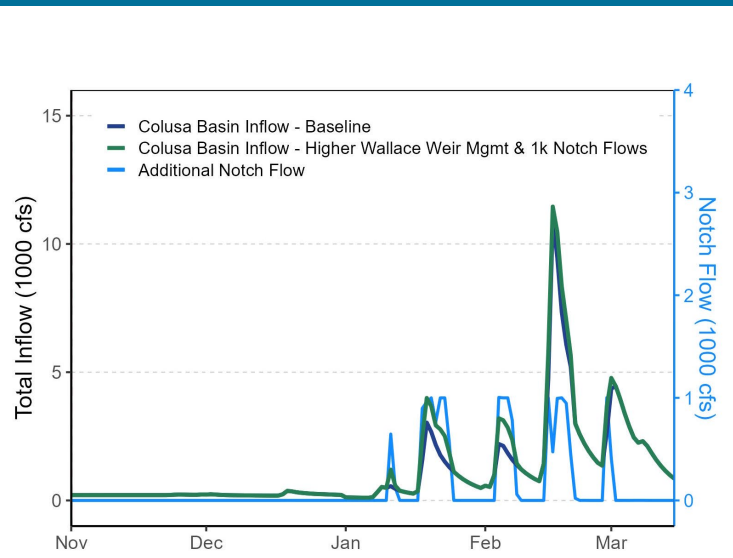
Colusa Basin – Sacramento River Notch and Water Management Level Testing

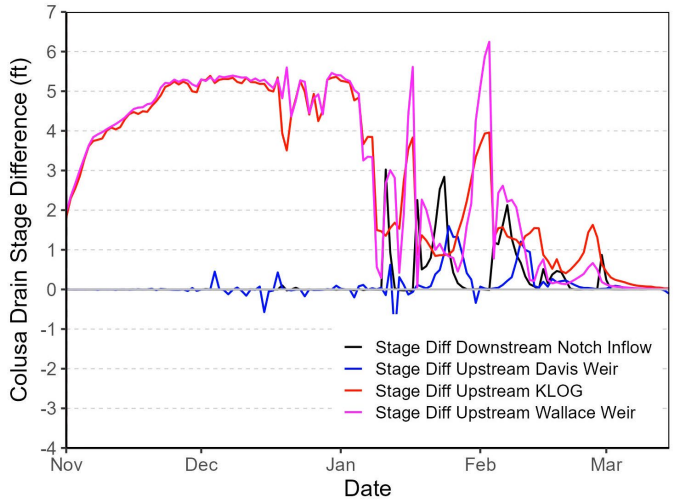
Description

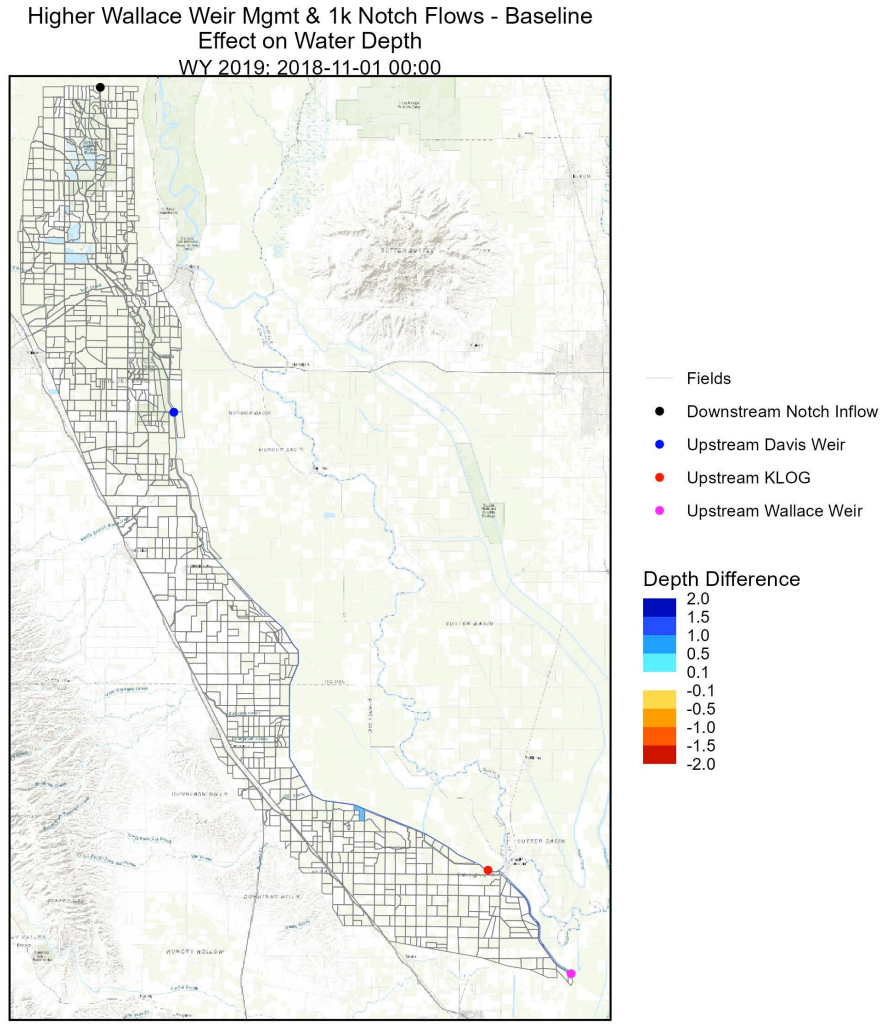
- Management Considerations:
  - Wallace Weir/ KLOG
    - Higher Management Level
      - Original Management Level: 22.4 ft
      - Higher Management Level: 27.75 ft
  - Davis Weir
    - Original Management
      - Adjusts to maintain an upstream stage of 36.93 ft
    - Higher Management
      - Held at highest level from Nov 1 – Mar 1



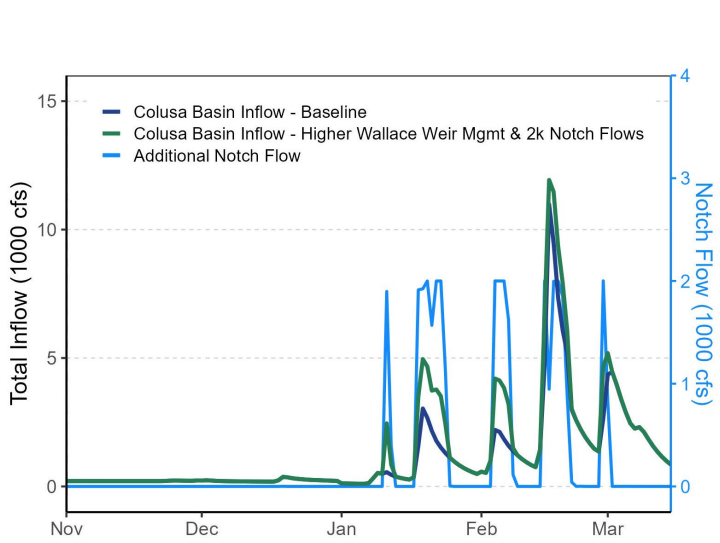
Colusa Basin – 1000 cfs Notch Action

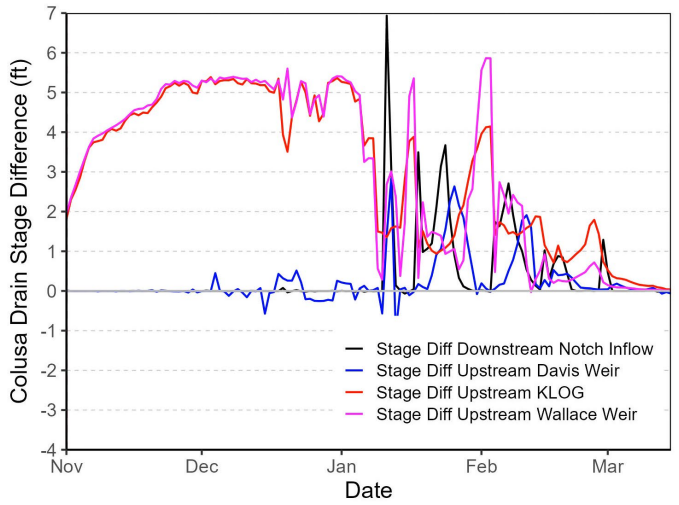


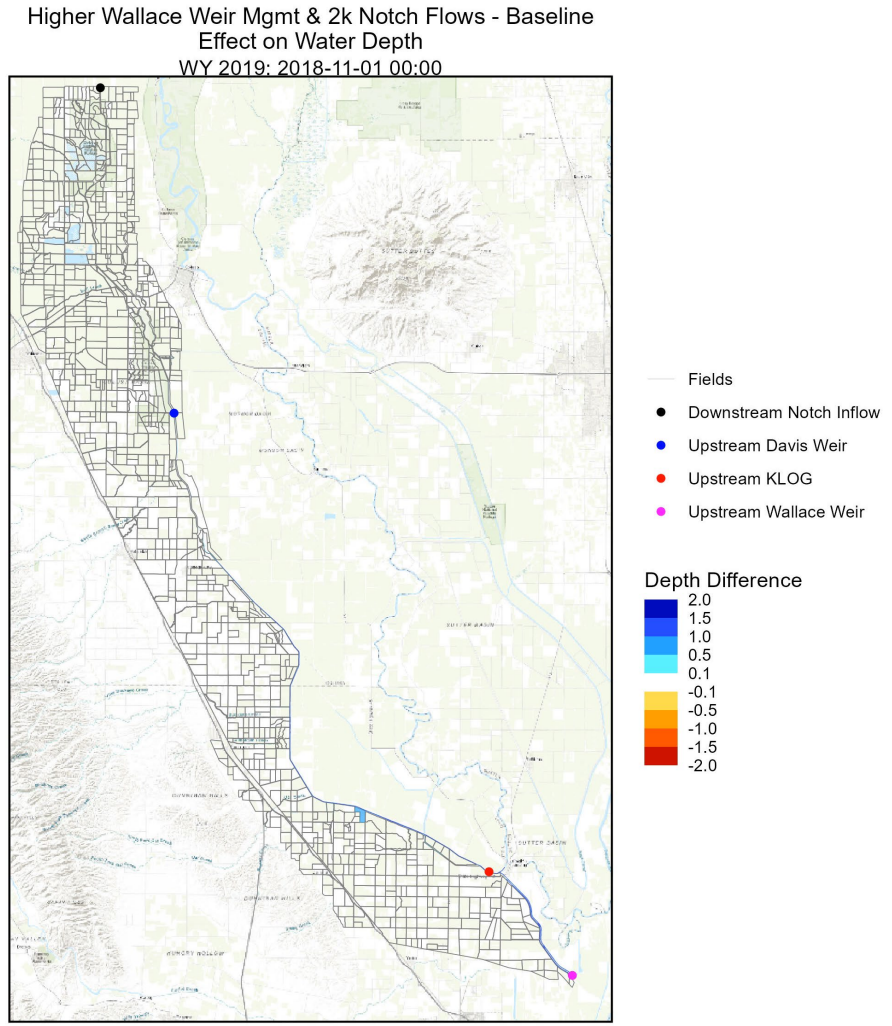




Colusa Basin – 2000 cfs Notch Action

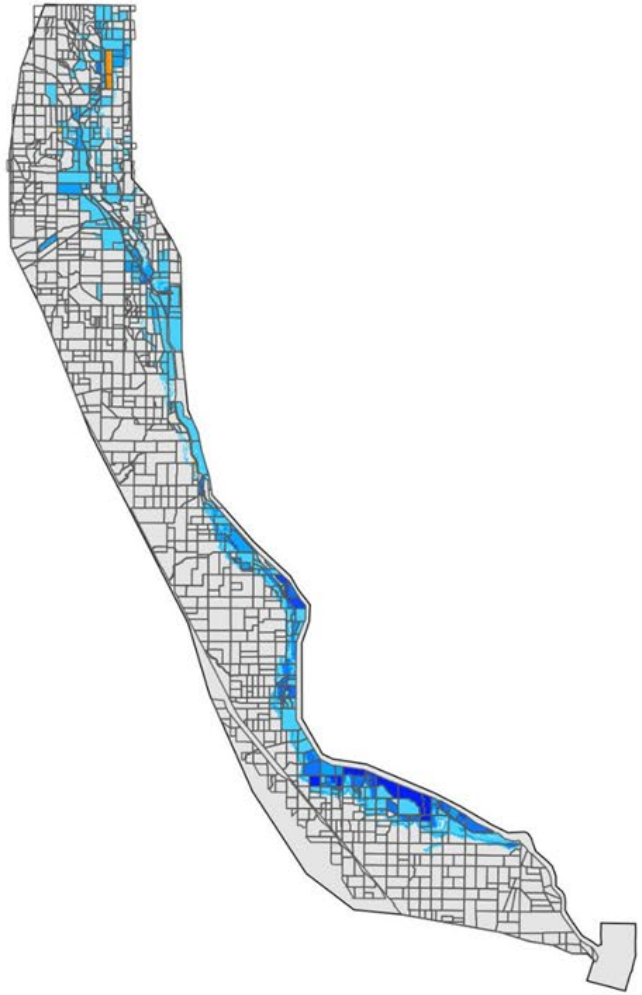




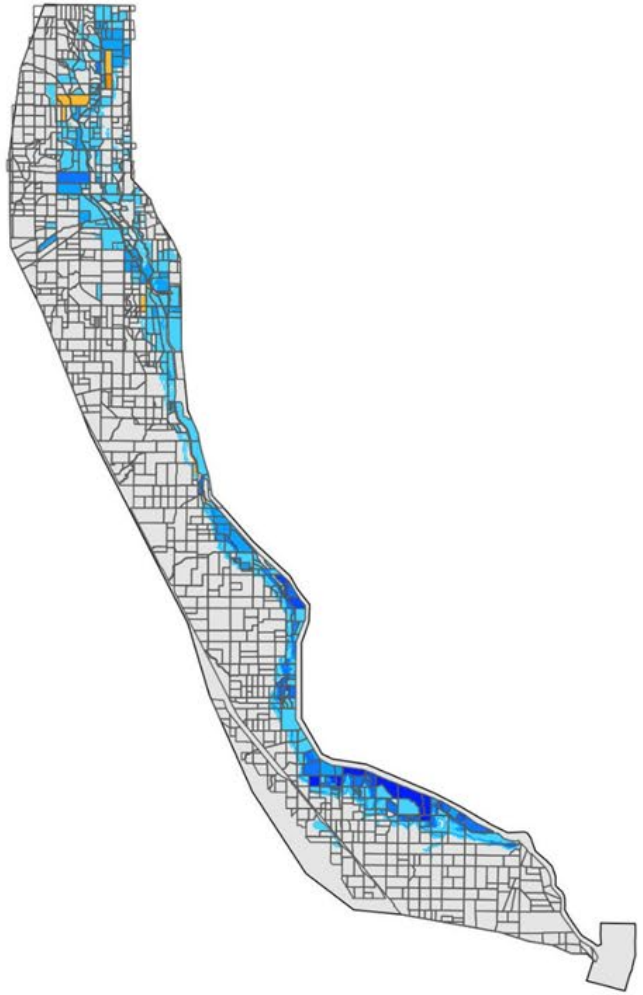


Salmon Habitat Suitability – Difference in Total WUA

1000 cfs Notch



2000 cfs Notch



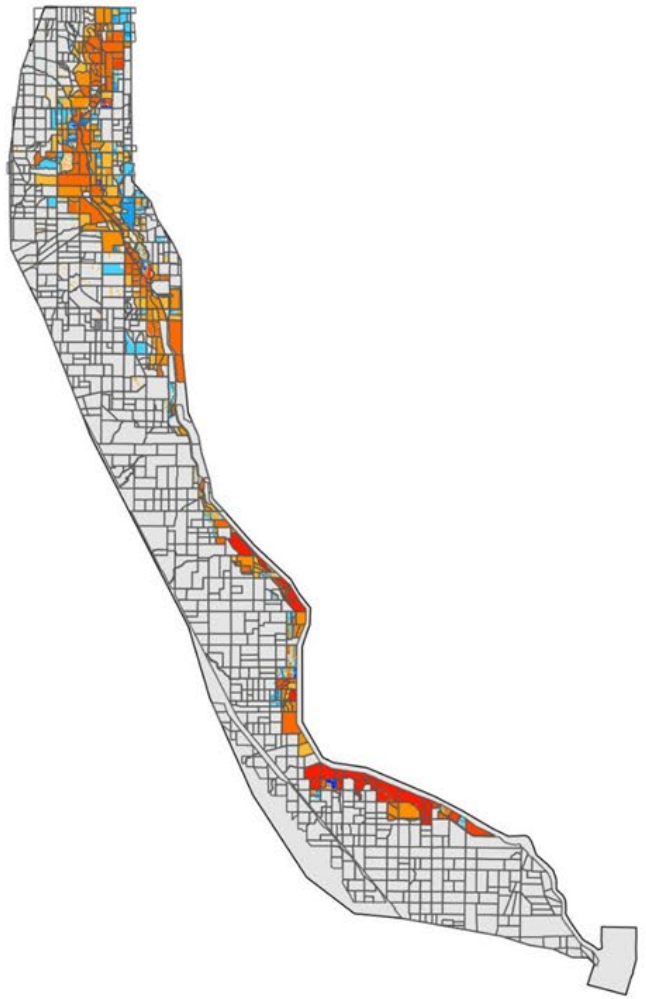
Suitability Sum Difference

50.0
28.0
14.0
7.0
3.0
0.1
-0.1
-3.0
-7.0
-14.0
-28.0
-50.0

Waterfowl Habitat Suitability – Difference in Total WUA

1000 cfs Notch

2000 cfs Notch

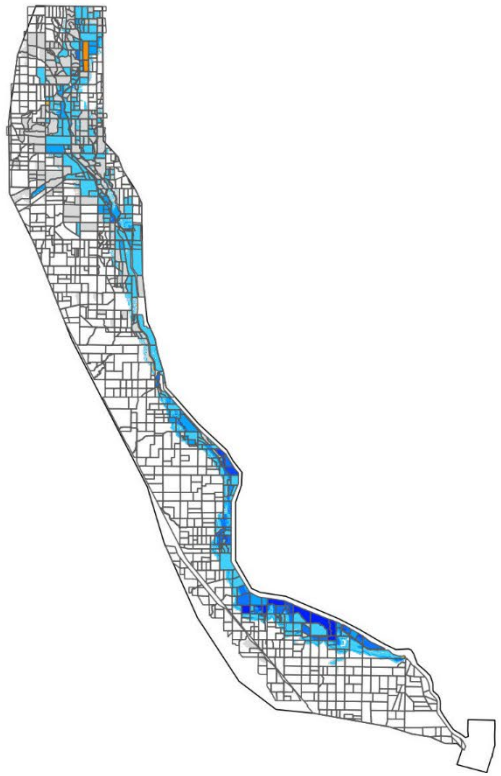


Suitability Sum Difference

50.0
28.0
14.0
7.0
3.0
0.1
-0.1
-3.0
-7.0
-14.0
-28.0
-50.0

Habitat Suitability – Waterfowl and Juvenile Salmon Tradeoffs

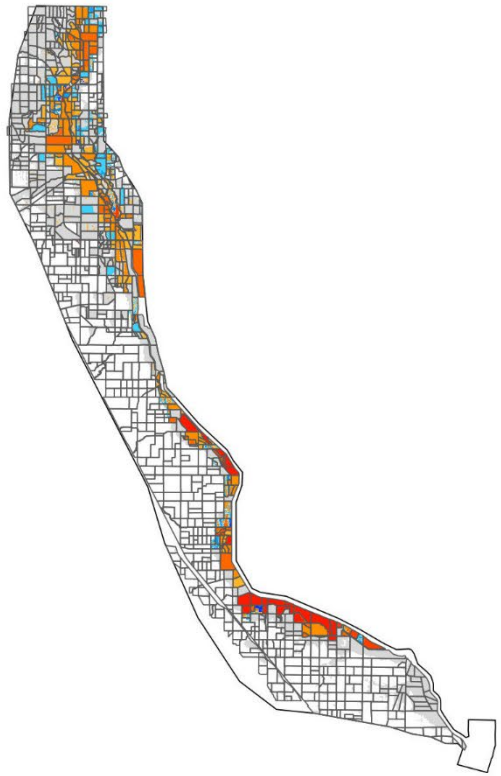
Salmon
Higher Wallace Weir Level
1000 cfs Notch



Suitability Sum Difference

50.0
28.0
14.0
7.0
3.0
0.1
-0.1
-3.0
-7.0
-14.0
-28.0
-50.0

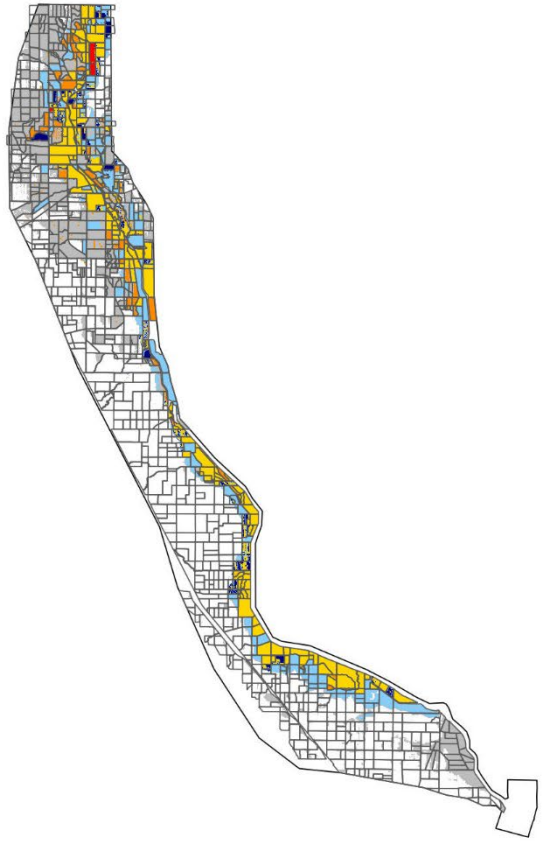
Waterfowl
Higher Wallace Weir Level
1000 cfs Notch



Suitability Sum Difference

50.0
28.0
14.0
7.0
3.0
0.1
-0.1
-3.0
-7.0
-14.0
-28.0
-50.0

Higher Wallace Weir Level
1000 cfs Notch

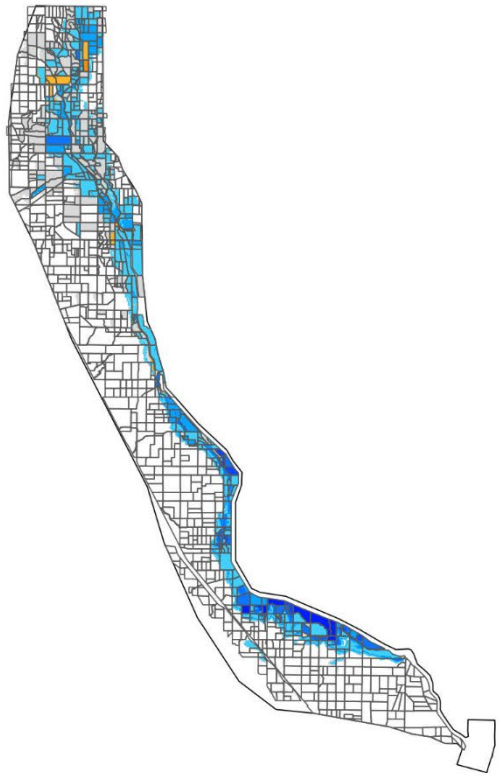


Salmon
+ 0 -

Waterfowl
+
0
-

Habitat Suitability – Waterfowl and Juvenile Salmon Tradeoffs

Salmon
Higher Wallace Weir Level
2000 cfs Notch



Suitability Sum Difference
50.0
28.0
14.0
7.0
3.0
0.1
-0.1
-3.0
-7.0
-14.0
-28.0
-50.0

Waterfowl
Higher Wallace Weir Level
2000 cfs Notch

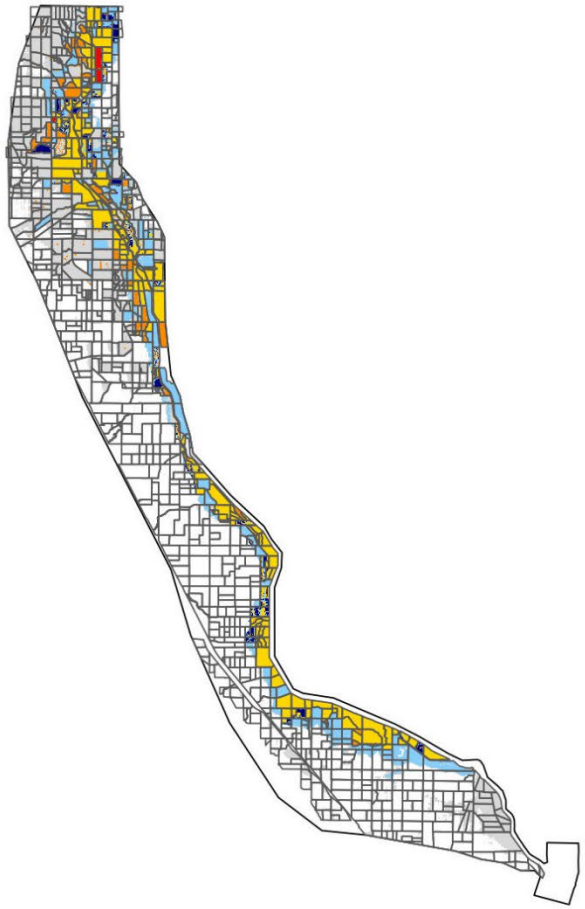
Suitability Sum Difference
50.0
28.0
14.0
7.0
3.0
0.1
-0.1
-3.0
-7.0
-14.0
-28.0
-50.0

Higher Wallace Weir Level
2000 cfs Notch

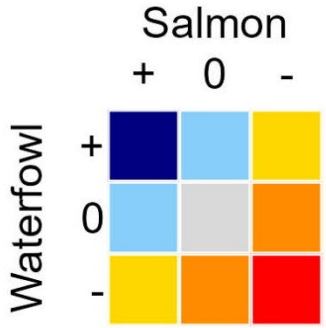
Salmon
+ 0 -
Waterfowl
+
0
-

Waterfowl Habitat Suitability – Difference in Total WUA Tradeoffs

Higher Wallace Weir Level
1000 cfs Notch



Higher Wallace Weir Level
2000 cfs Notch



Recommended River Connection Notch Actions

Does the Advisory Committee support the proposed recommendation to the Steering Committee to run full feasibility analysis for 2000 cfs river connection actions?

Current Simulated Actions - X Recommended Flow for Notch Actions - **X**					
Basin	Action	1000 cfs	2000 cfs	3000 cfs	6000 cfs
Butte	Moulton Weir Notch	X	**X**	X	X
Butte	Colusa Weir Notch	X	**X**	X	X
Butte	Moulton and Colusa Weir Notch Combination		**X**	X	
Colusa	Colusa Drain Notch & Higher Wallace Weir Management	X	**X**		

- Full Feasibility Analysis of Scenarios (Next Steps):
  - Run out key river connections for select water years
  - Layer on other potential actions to form scenarios
    - Floodplain infrastructure
    - Land Management
    - Habitat Restoration
  - Perform multi-benefit analysis and assess landowner willingness

Questions?