
Doug Backlund

Missouri River Emergent Sandbar Habitat

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Kelly Crane, Tim Fleeger, Craig Fleming,
Teresa Reinig, US Army Corps
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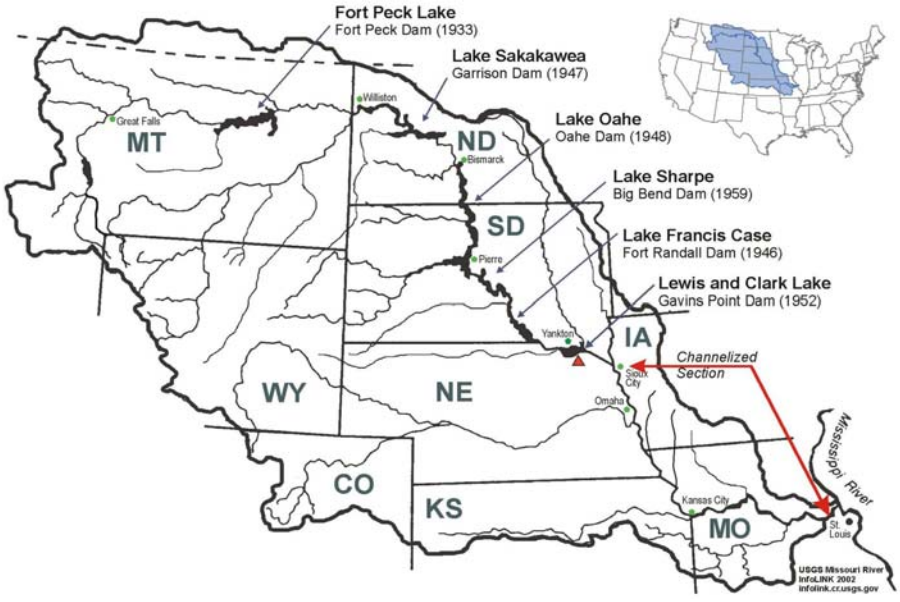


Problem Statement

- How much, where and by which means to create Emergent Sandbar Habitat (ESH) in a focal year (e.g., FY 2015) for **tern** and **plover** nesting and brood rearing in Gavins' Reach?

Missouri River Habitat

Objectives

- Minimize cost/acre
- Meet Fledge Ratios
- Meet 2015 Acreage Targets
- Minimize socioeconomic impacts to stakeholders

"Bob and Ruth! Come on in.... Have you met Russell and Bill, our 1.5 children?"

Potential Actions

- How much to create in a year
- What methods
  - Create

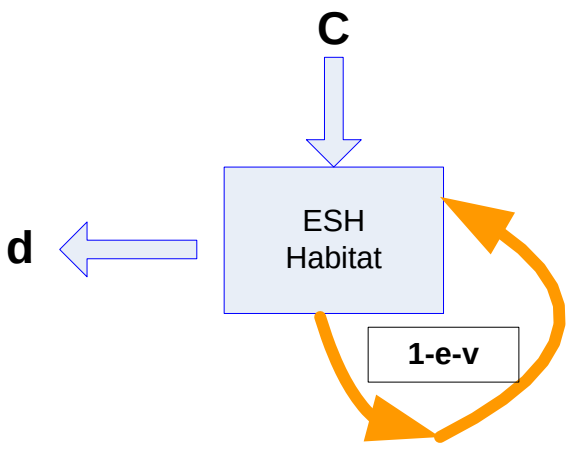
Potential Actions

- How much to create in a year
- What methods
  - Create
  - Devegetate

Potential Actions

- How much to create in a year?
- What methods
  - Create
  - Devegetate
  - Devegetate and overtop
  - Flows

First Prototype



Actions	Option 1	Option 2	Option 3	Option 4
Build (acres)	200	100	50	0
Deveg (acres)	0	333	500	667
Objectives				
Cost	4M	4M	4M	4M
Incremental Area	200	433	550	667
Total Area	835	1068	1185	1302
Fledge Ratio	1.1	1.0	0.9	0.8
Disturbance	H	M	M	L

Epiphanys from First Model

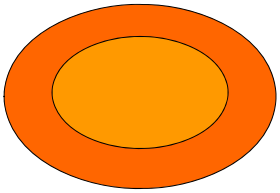
- Exact data not necessary
- Practice leads to comfort
- Improved understanding of the system
- This is too simple for the real world

2nd Go-Around

- Added
  - multiple year influence
  - stochastic flow
  - tern & plover breakdown

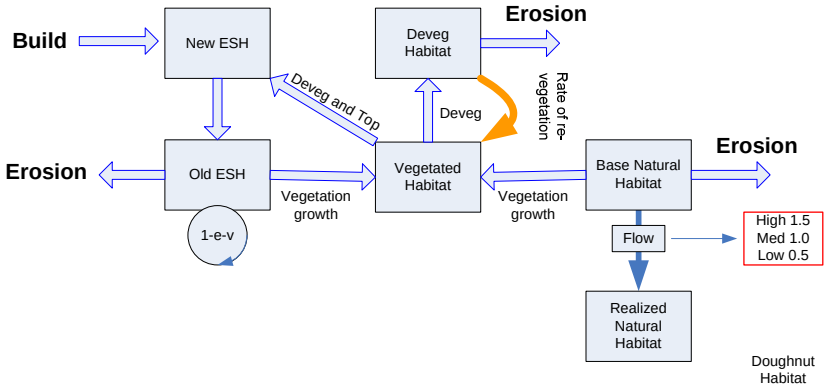
Second Prototype Model

- Different Habitat Type = Different Fledge Ratio
  1. New ESH
  2. Old ESH
  3. Devegetate and overtop
  4. Natural
  5. Rate of change
  - Vegetation and erosion
  6. Donut Habitat - Flows

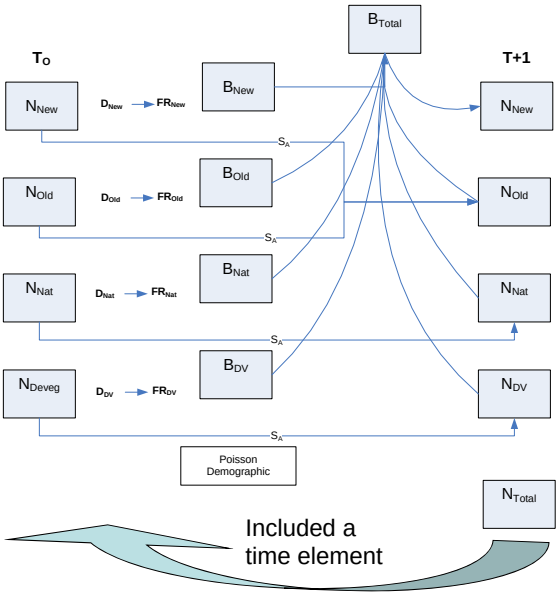


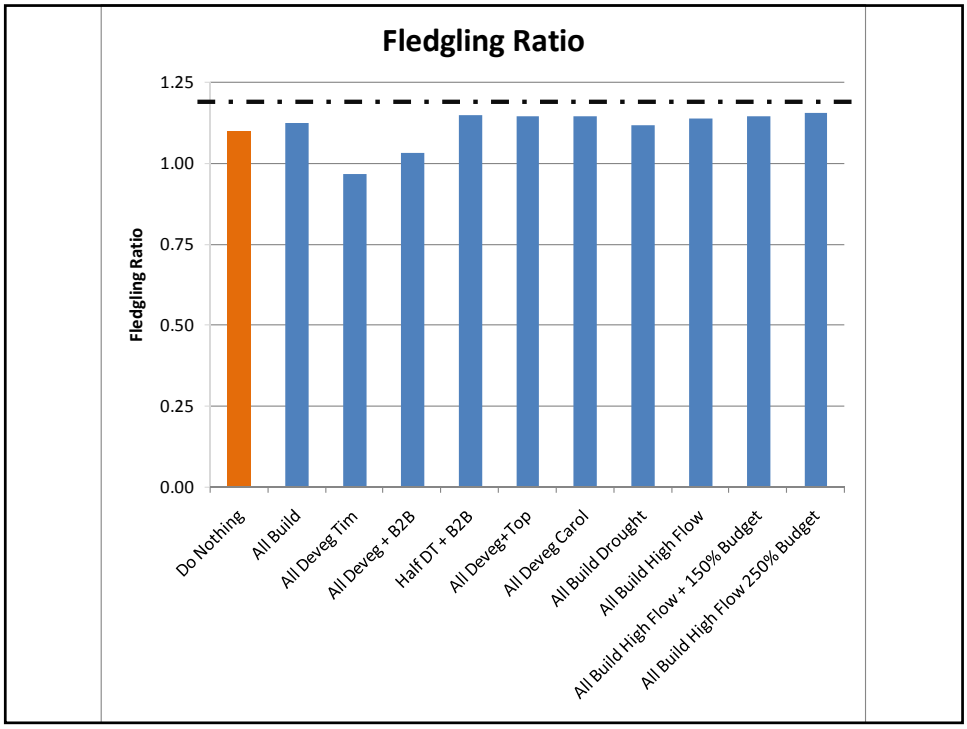

Nest Mound
Chicks on Shoreline

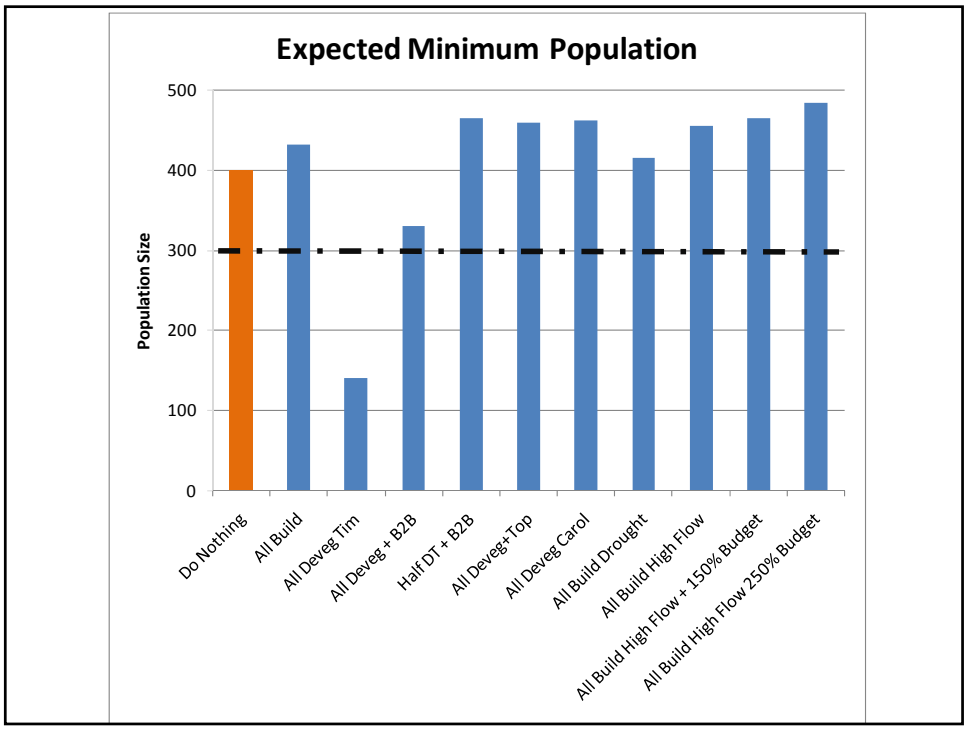
Second Prototype Habitat Model

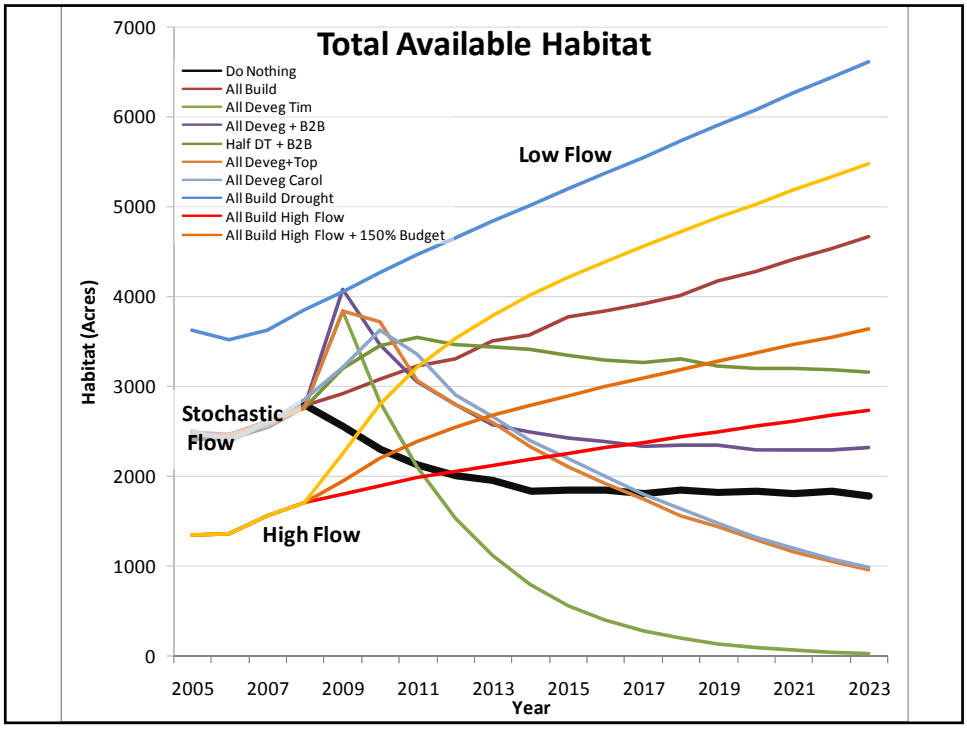


Population Model for 2nd Prototype




Fledgling Ratio
Fledgling Ratio
1.25
1.00
0.75
0.50
0.25
0.00
Do Nothing
All Build
All Deveg Tim
All Deveg + B2B
Half DT + B2B
All Deveg+Top
All Deveg Carol
All Build Drought
All Build High Flow
All Build High Flow + 150% Budget
All Build High Flow 250% Budget


Expected Minimum Population
Population Size
500
400
300
200
100
0
Do Nothing
All Build
All Deveg Tim
All Deveg + B2B
Half DT + B2B
All Deveg+Top
All Deveg Carol
All Build Drought
All Build High Flow
All Build High Flow + 150% Budget
All Build High Flow 250% Budget



Realizations from 2nd Prototype

- More realistic, but large data uncertainties
  - Fledge ratios probably not right
  - Density dependence unknown
  - Flow effects on habitat
- Would need significantly more data to translate to the real world
- First prototype addressed decision making questions more clearly

Some Next Steps

- Continue to work together to develop models to help address the bigger questions
- Implement monitoring to measure identified objectives
- Proselytize SDM to include managers

NEED PROFESSIONAL HELP!

Thanks to

- Drew Tyre
- Wayne Thogmartin
- Donna Brewer

Questions?

Project

- Rapid Prototype for Emergent Sandbar Habitat Creation activities below Gavins Point Dam.
  - Corps activities (Dams & water management) caused loss of habitat – tern and piping plover federally listed
  - Birds utilize exposed sandbars for nesting, brooding and rearing
  - BO on river operations included emergent sandbar restoration goals (acreages)
  - Corps proposes to mechanically create habitat to avoid jeopardy to terns and plovers

Context for Project

- Consultation contentious, river operations subject of multiple litigation
- In year 7 of BO implementation without required Adaptive Management Program in place
- Long-term data sets for tern and plover numbers and productivity
- Ongoing Monitoring and Research Program without clear understanding of use of data/analyses

Context for Project

- FWS/NPS supports flow management to address habitat needs
- NPS believes long-term legal conflicts are imminent
- Corps believes habitat can be mechanically created without flow (huge political issue)
  - Downstream flood constraints
  - Other authorized purposes
- Upcoming PEIS on ESH rather than current project by project approach
- Change comes hard

Problem Statement

- How much, where and by which means to create Emergent Sandbar Habitat (ESH) in each year for **tern** and **plover** nesting and brood rearing in Gavins' Reach?

Objectives

- Minimize cost/acre
- Meet fledge ratios
- Minimize construction-related disturbance
- Meet acreage target 2015
- Minimize socio-economic impacts
- Maximize Expected Minimum Population Size (MEMPS) to 20XX
- Minimize cumulative impacts to outstandingly remarkable values* and freeflowing characteristics and water quality

* As defined in the Wild and Scenic Rivers Act

Outstandingly Remarkable Values

- Fish and Wildlife
- Recreation
- Cultural Resources
- Historical Resources

Actions

- Build X acres in year *t*
- Deveg Y acres in year *t*
- Deveg and top Z acres in year *t*
- Flow
  - Island building
  - Conditioning
  - Low summer

Constraints

- Dollars
- Time
- Understanding of different values of unique habitats
- NPS Rec River
- Sediment budget
- Lack of analysis and Decision making process
- Lack of Adaptive strategy

Prototype Objectives

- Meet Acreage goals on time
- Create the maximum amount of ESH for the least cost
- Ensure created habitat is meeting species' needs

Corps, FWS, & NPS Goals

- To develop a prototype that will lead to a solid process to collaboratively implement the ESH program and avoid jeopardy to the tern and plover.
- To develop a team of participants with commitment and expertise in collaborative problem solving

- Predictive Model- What features are necessary in a model that will predict the consequences of each action in terms that are relevant to the objectives?
  - None exist overtly.
  - What would it take to create them?