
WF4313/6413-Fisheries Management

A dark, grainy photograph of a fishing vessel at sea. The boat's hull is visible in the lower right, and its deck is covered with equipment and supplies. Numerous long, thin fishing nets or lines are deployed from the stern towards the upper left, creating a complex web against the dark background.

Class 18

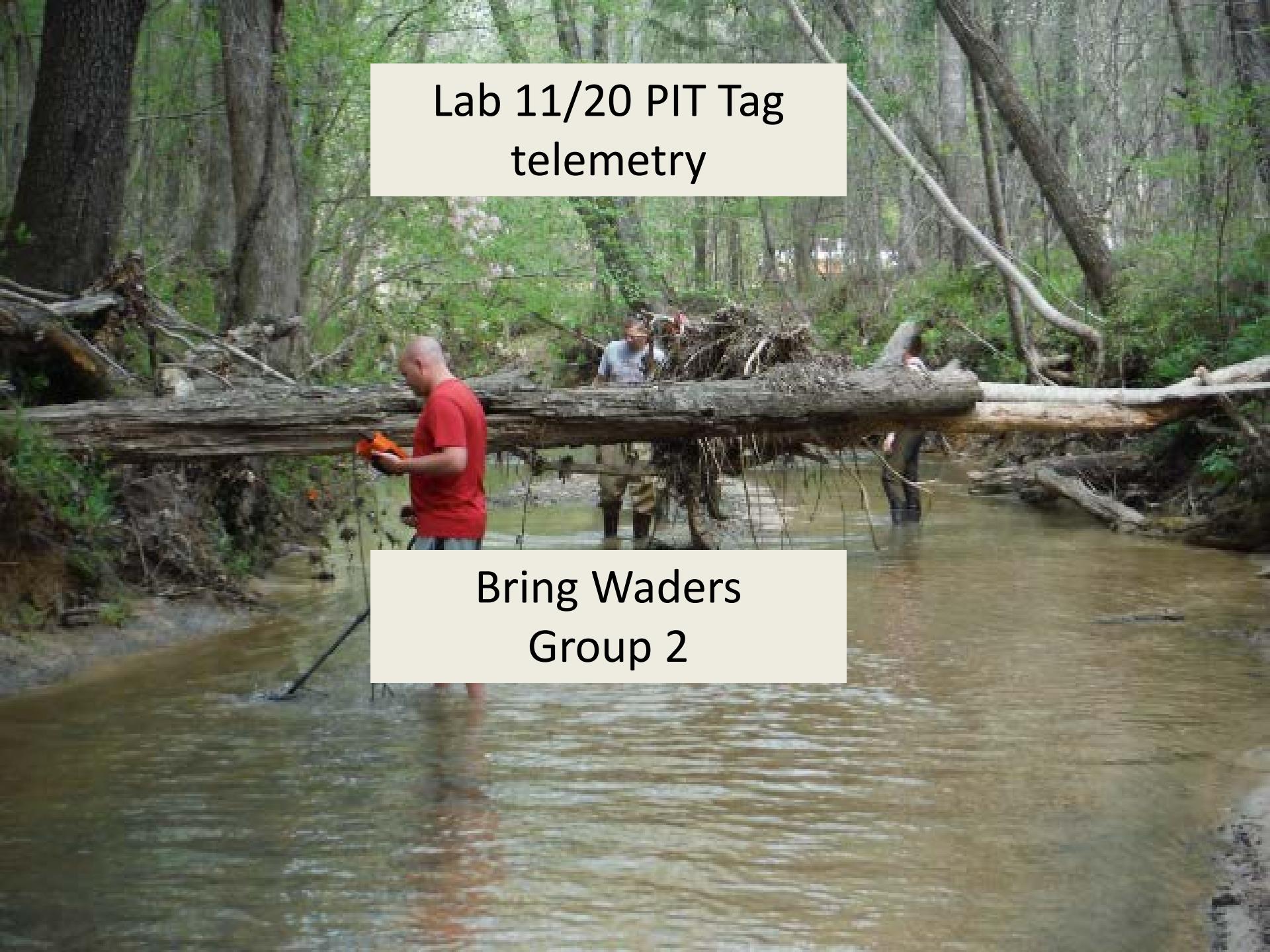
Announcements



Revised Schedule**

- ~~October 30 = Group 1 @ Panther Creek~~
 - ~~November 6th = Group 2 we'll do something~~
 - November 13th = NO LAB... ☹
 - Exam II = November 14th
 - November 20th = Group 1 will do what group 2 did
 - November 27th & December 4th ???
- ** Contingent on van availability



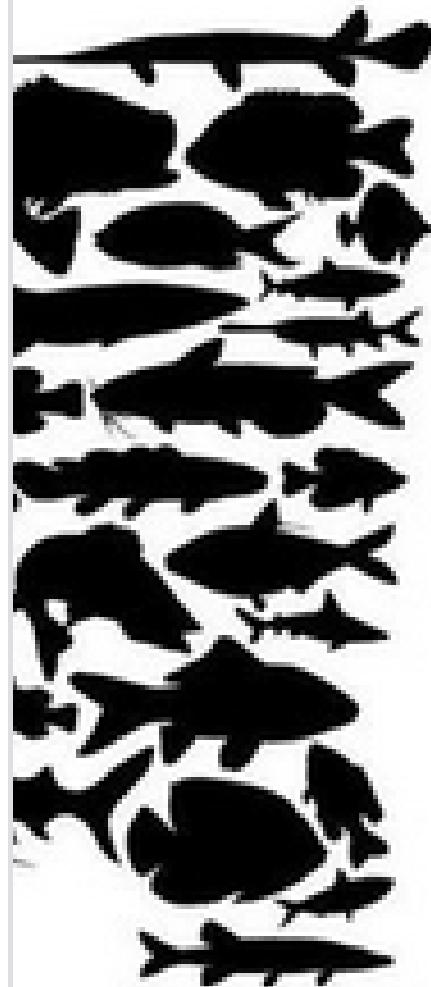


Lab 11/20 PIT Tag
telemetry

Bring Waders
Group 2

Tonight @ 5pm TH118

Pizza and Olives



**AMERICAN
FISHERIES
SOCIETY
MISSISSIPPI
STATE
UNIVERSITY
STUDENT
SUB-UNIT**

Interested in chasing more lamprey?

Opportunities to assist on an
undergraduate research project.

Saturday November 17th



Lab Results...? Holy crap...

15
unique
tags!

Row Labels	P1	P2	P3	P4	P5	P6	Grand Total
384.0A0301E963			1	1			2
384.0A0301E978	1		1	1	1	1	5
384.0A0301E97D			1				1
384.0A0301E986			1				1
384.0A0301E992		1			1		2
384.0A0301E998				1			1
384.0A0301E999	1	1					2
384.0A0301E99B	1	1	1		1		4
384.0A0301E9A2	1						1
384.0A0301E9A7	1		1				2
384.0A0301E9AF	1						1
384.0A0301E9B0	1			1			2
384.0A0301E9B8	1	1		1	1		4
384.0A0301E9BC	1	1		1			3
384.0A0301E9C0		1			1		2
Count	6	7	7	4	5	4	

Row Labels	P1	P2	P3	P4	P5	P6	Grand Total	Pr(Detect)
384.0A0301E963			1		1		2	0.13
384.0A0301E978	1		1	1	1	1	5	0.33
384.0A0301E97D			1				1	0.07
384.0A0301E986			1				1	0.07
384.0A0301E992			$N_{\text{tagged}} = N_{\text{captured}} / \text{Pr}(\text{capture})$				2	0.13
384.0A0301E998					1		1	0.07
384.0A0301E999			$N_{\text{tagged}} = 15 / (1 - 0.06) = 15.99$				2	0.13
384.0A0301E99B		1	1	1	1	1	4	0.27
384.0A0301E9A2		1	Likely we missed 1!				1	0.07
384.0A0301E9A7	1		1				2	0.13
384.0A0301E9AF	1						1	0.07
384.0A0301E9B0	1				1		2	0.13
384.0A0301E9B8	1	1		1	1		4	0.27
384.0A0301E9BC	1	1		1			3	0.20
384.0A0301E9C0		1				1	2	0.13
Count	6	7	7	4	5	4		
Pr(detect)	0.4	0.47	0.47	0.27	0.33	0.27		Pr(Missing any)
Pr(no detect)	0.60	0.53	0.53	0.73	0.67	0.73		0.06

Product of Pr(no detect)
 Probability of capture over all 6
 passes is $1 - \text{Pr}(\text{Missing any})$

A photograph showing a massive pile of fish, likely catfish, stacked high on the deck of a small boat. The fish are piled in several layers, filling the frame. In the background, a calm river or lake extends towards a line of lush green trees under a clear blue sky.

WHERE WE LEFT OFF

Challenges to biodiversity

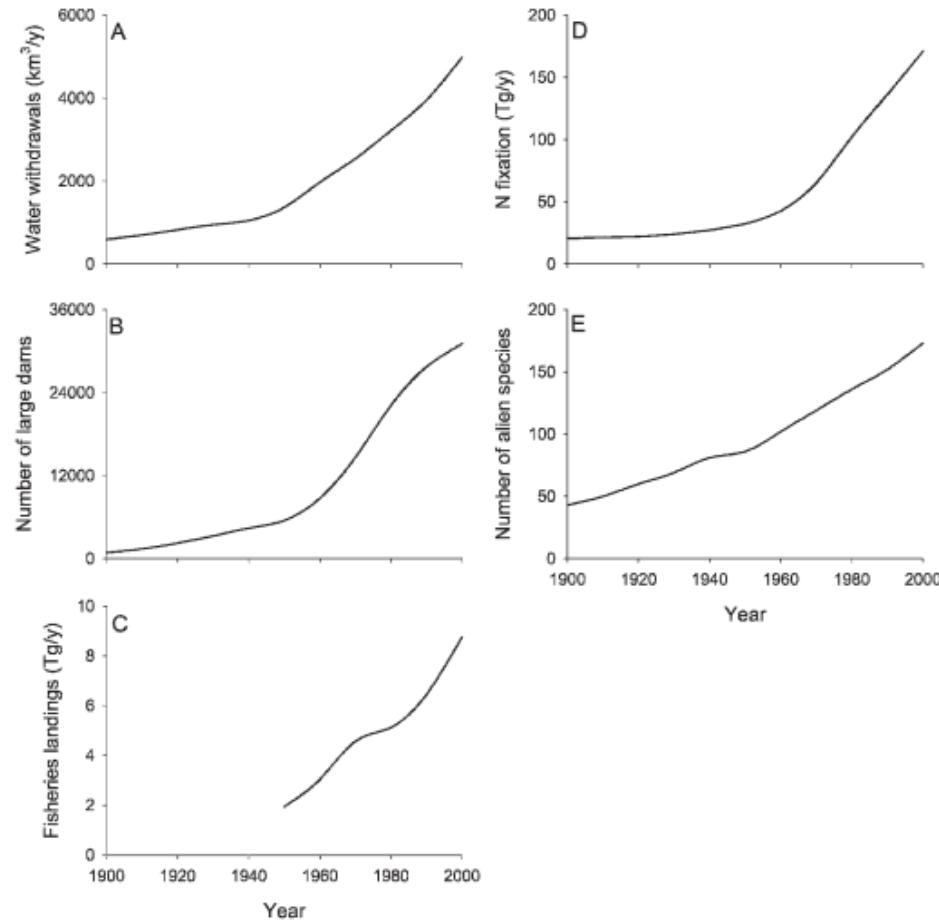
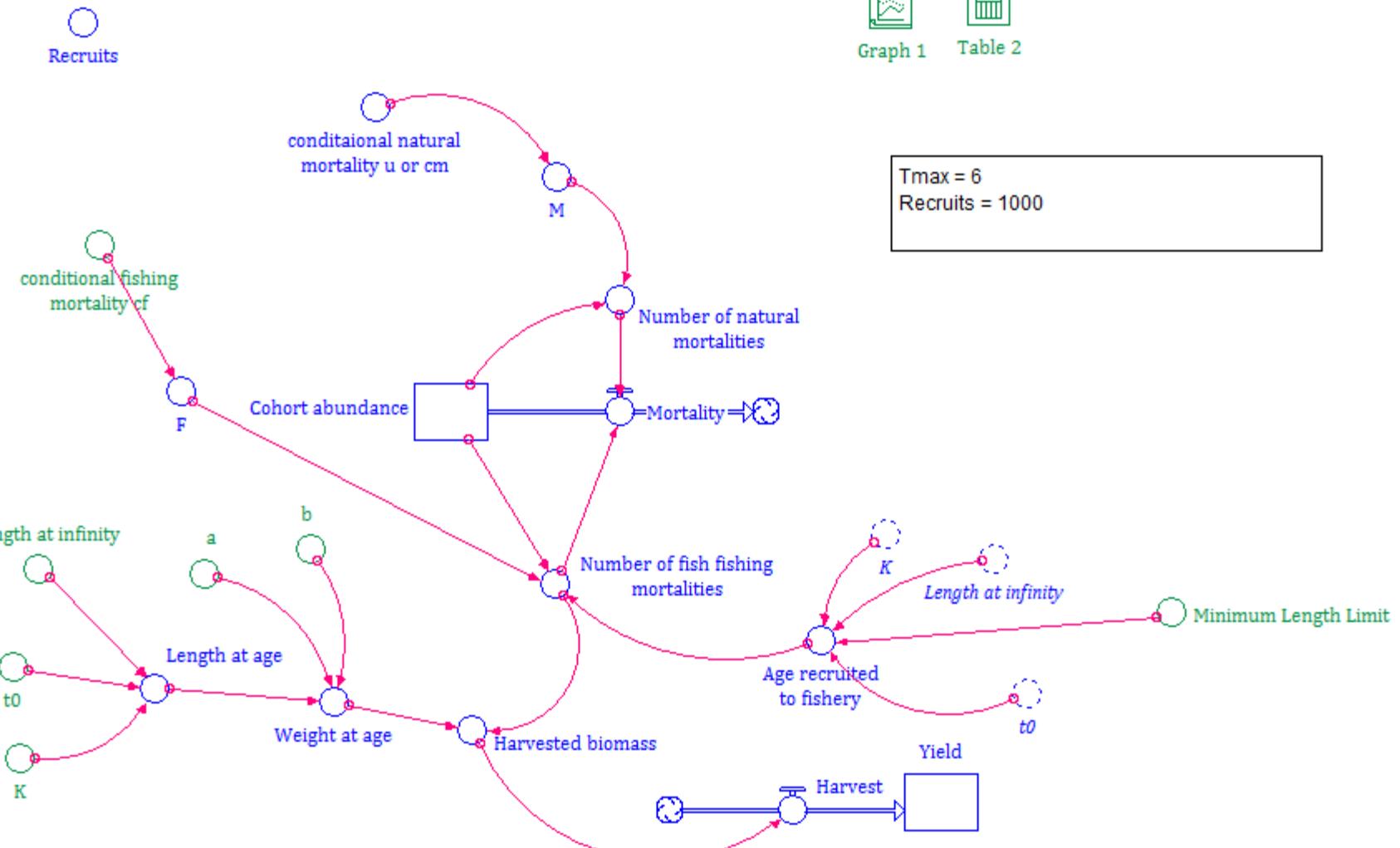


FIG. 1. Five examples of rising human pressures on the world's freshwater ecosystems. A.—Global water withdrawals (after Gleick 1993). B.—Number of large (>15 m high) dams (International Commission on Large Dams 2008). C.—Fisheries landings from inland waters (Allan et al. 2005a). D.—Global inputs of anthropogenically fixed N. Input from all natural sources is ~110 Tg/y (Vitousek 1994, Galloway et al. 2008). E.—Number of known alien species in the Laurentian Great Lakes (Ricciardi 2006).

Where is the habitat?



Fish Habitat



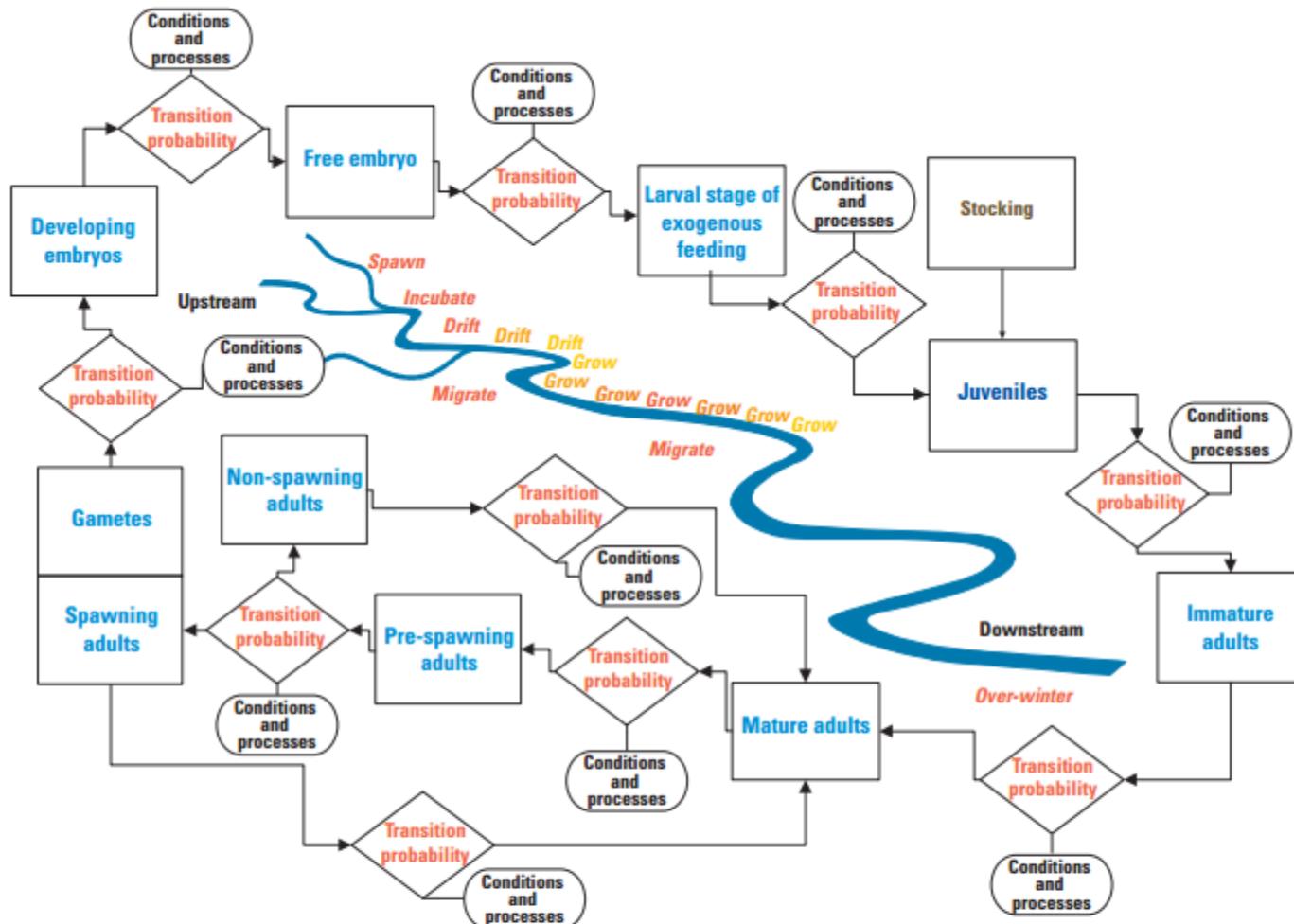
Water!

Elements of aquatic habitat

1. Amount
2. Chemical
 - Dissolved oxygen, pH, salinity
3. Physical
 - Sediment, turbidity, substrate
4. Biological
 - Macrophytes, Woody debris

Elements of aquatic habitat management

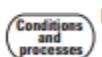
1. Restoration
2. Conservation
3. Mitigation



EXPLANATION



Indicates distinct life stages



Determines whether individual sturgeon complete the transition from one life stage to the next



Indicates transition from one life stage to the next



Indicates direction of sturgeon development



Figure 2. Conceptual model of *Scaphirhynchus* sturgeon life history.

An aerial photograph of a coastal area. In the foreground, there is a large expanse of dark water, likely a river estuary or a bay. A prominent, narrow, light-colored sandbar or spit extends from the bottom left towards the center of the frame. To the left of the water, a small, green, grassy island or peninsula is visible. In the background, across the water, there are rolling hills covered in a mix of green vegetation and brown, possibly agricultural fields. The sky is overcast with a uniform grey.

HABITAT MANAGEMENT

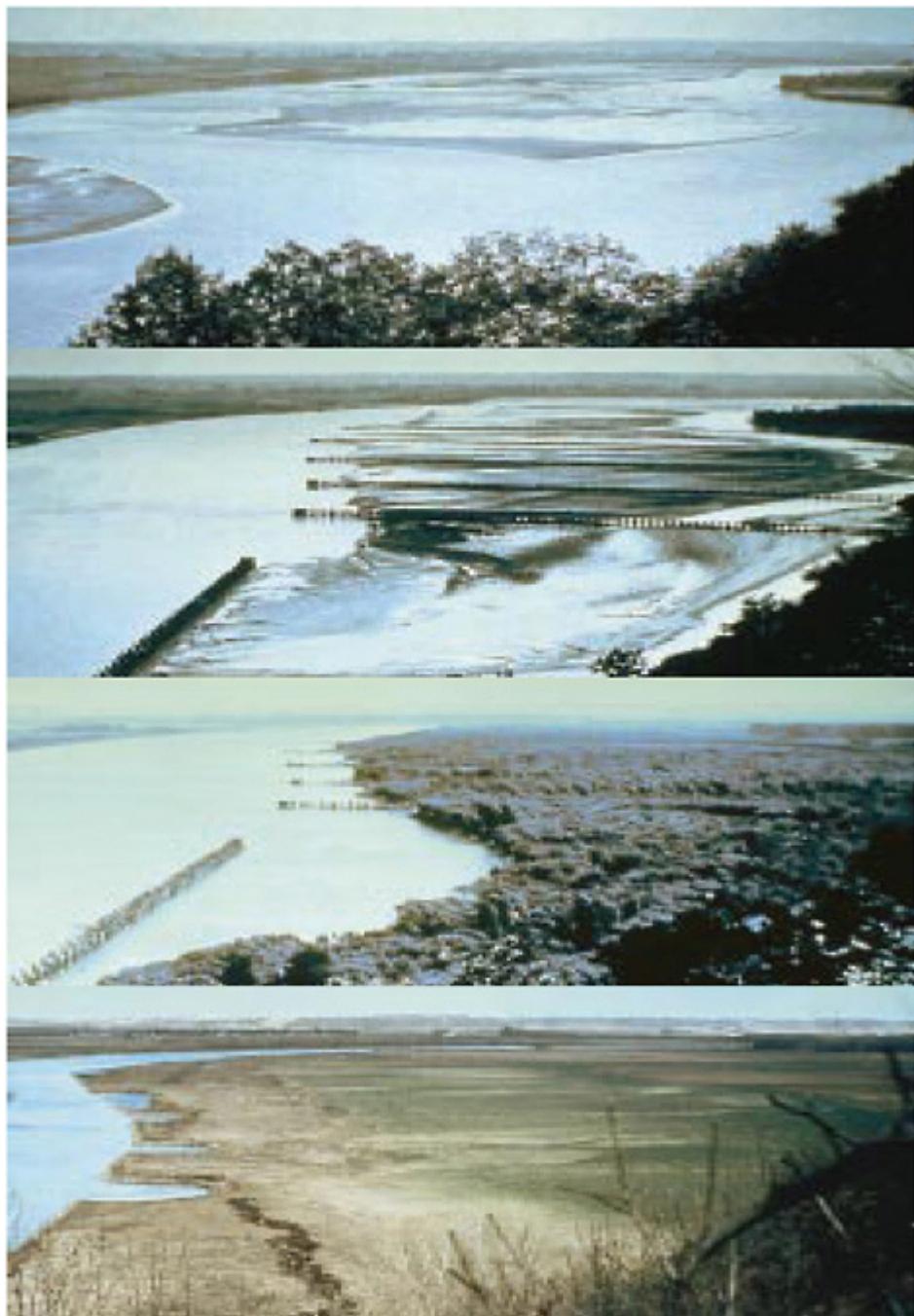
Lo. Mo. River @ Yankton



Channelization of the river



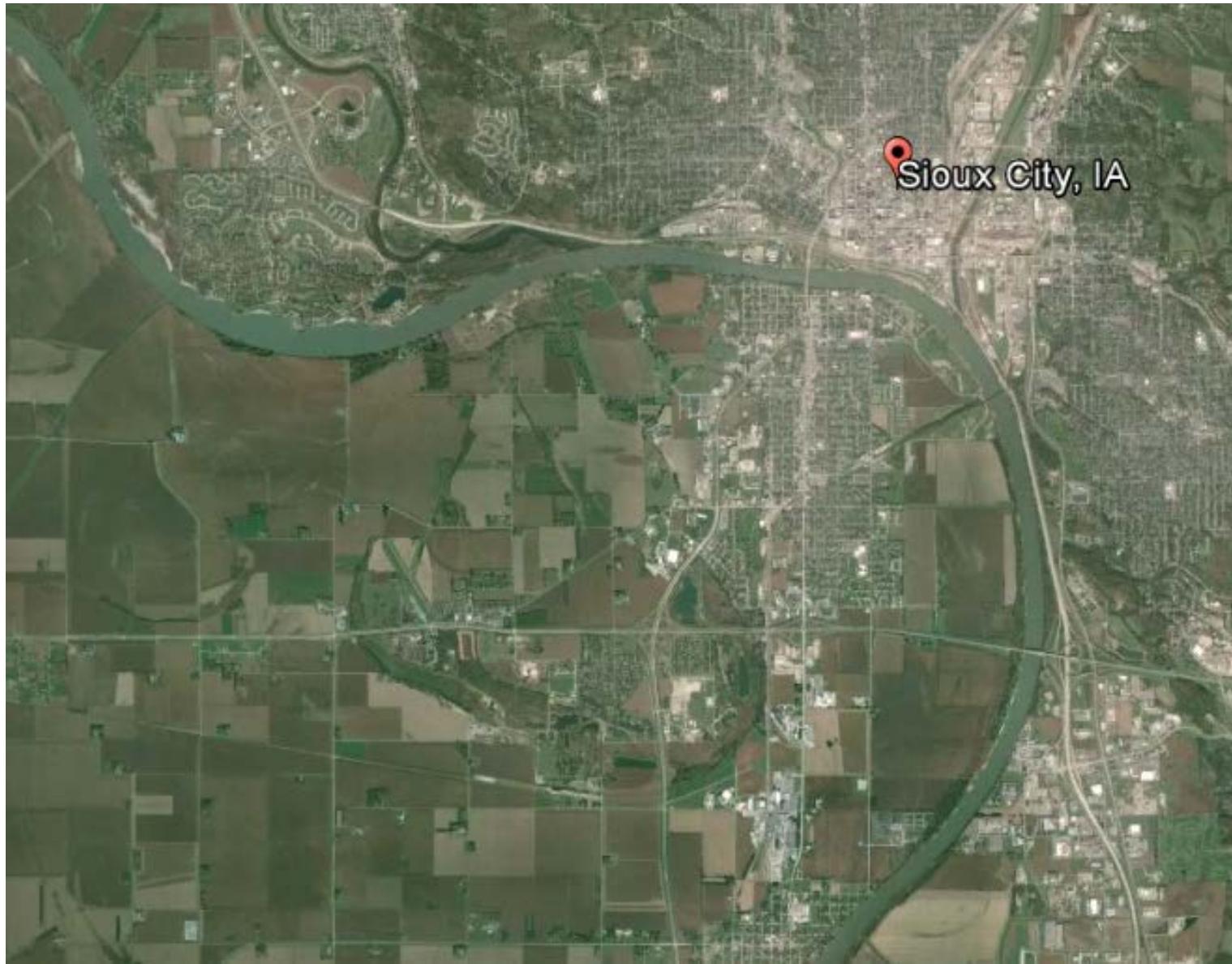
Indian Cave Bend on the Missouri River near river mile 517, about 18 miles upstream from Rulo, Nebraska. They illustrate the river before (1934; top photo) and after (1935, 1946, and 1977) the construction of brush dikes that narrowed and channelized the river.



Straightening Meanders



Lo. Mo. River @ Sioux City



Maintaining channels



Training outer bends



Flood control



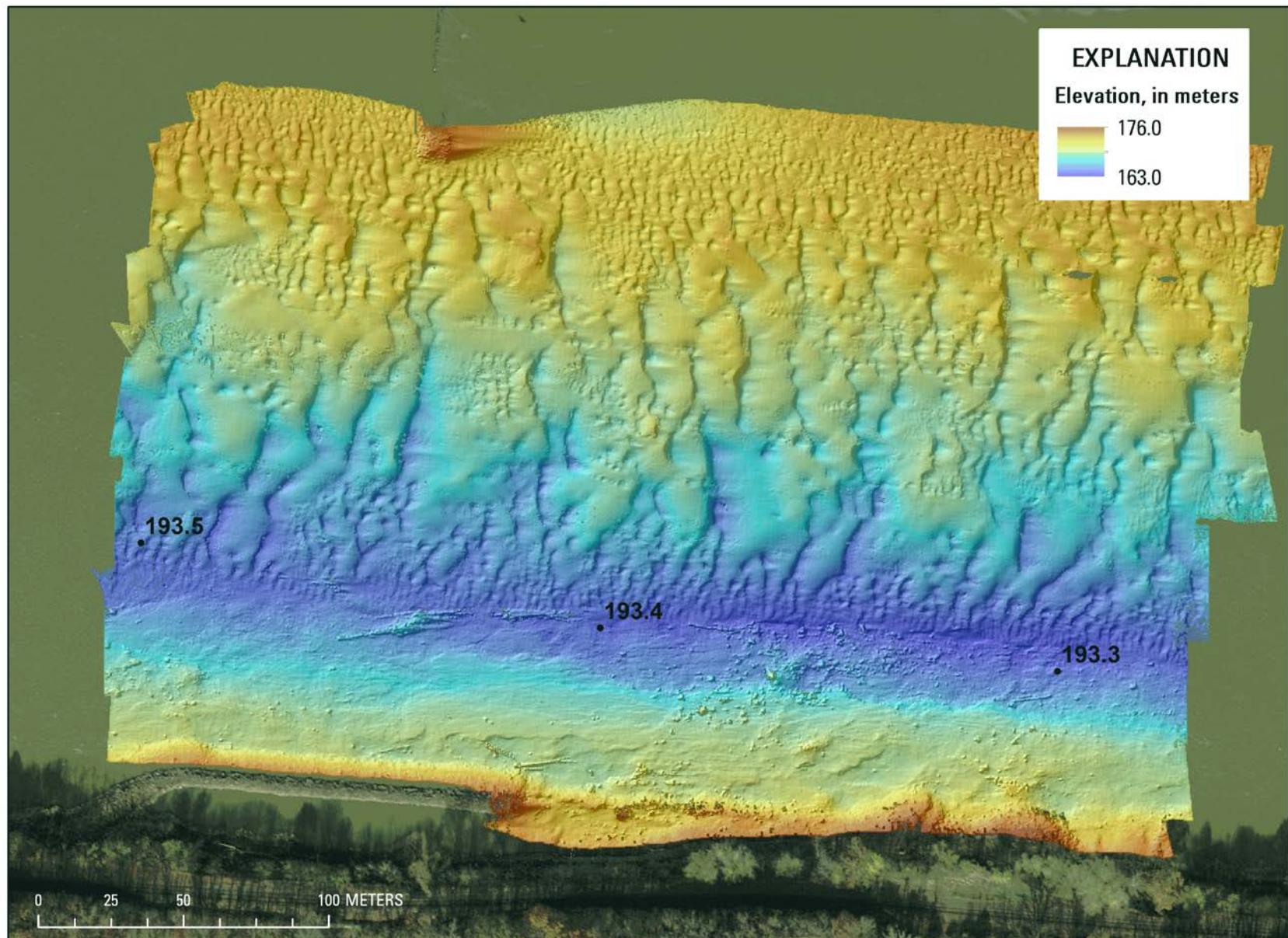
Effects of channelization

1. Chemical
 - Contaminants
2. Physical
 - Sediment, turbidity, substrate, flow
3. Biological
 - Energetic demand, life history habitats, prey communities

Elevated Flows

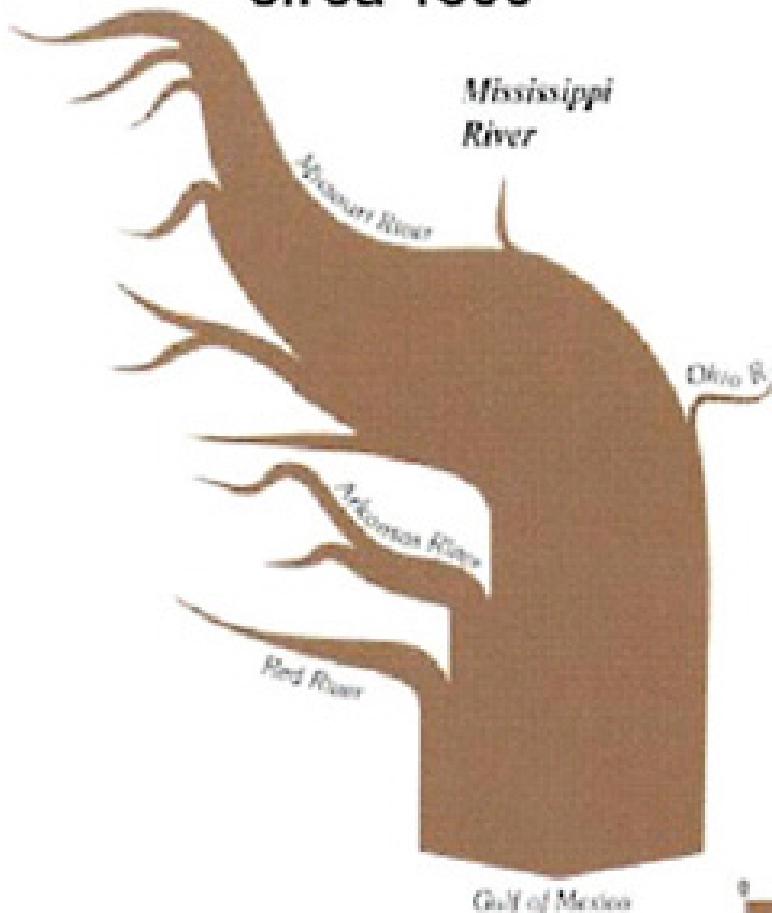


Dynamic Habitat

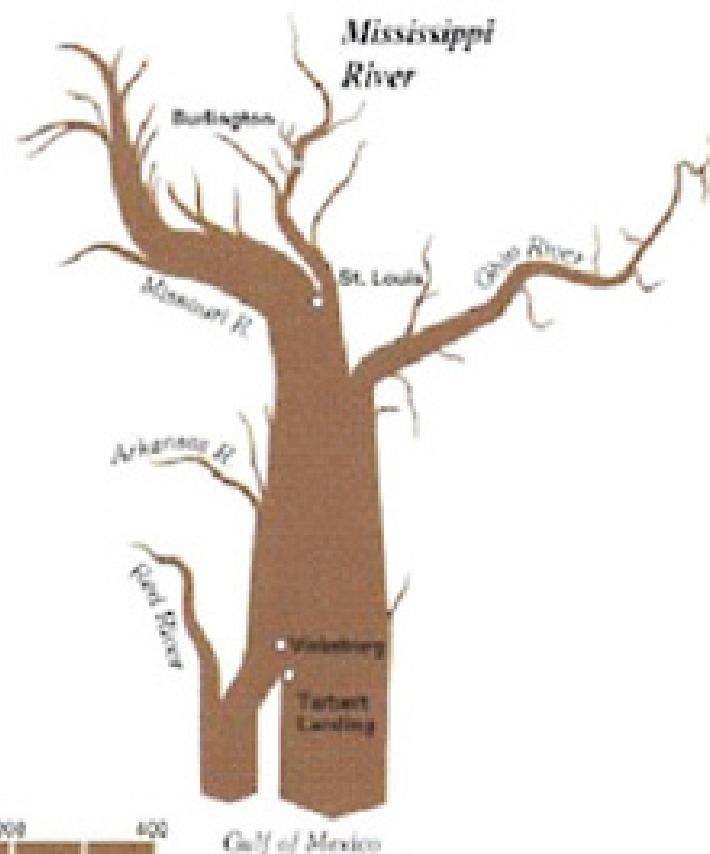


Sediment delivery

circa 1800



circa 1980





Upstream dams
allow sediment to
settle out &
increase water
clarity

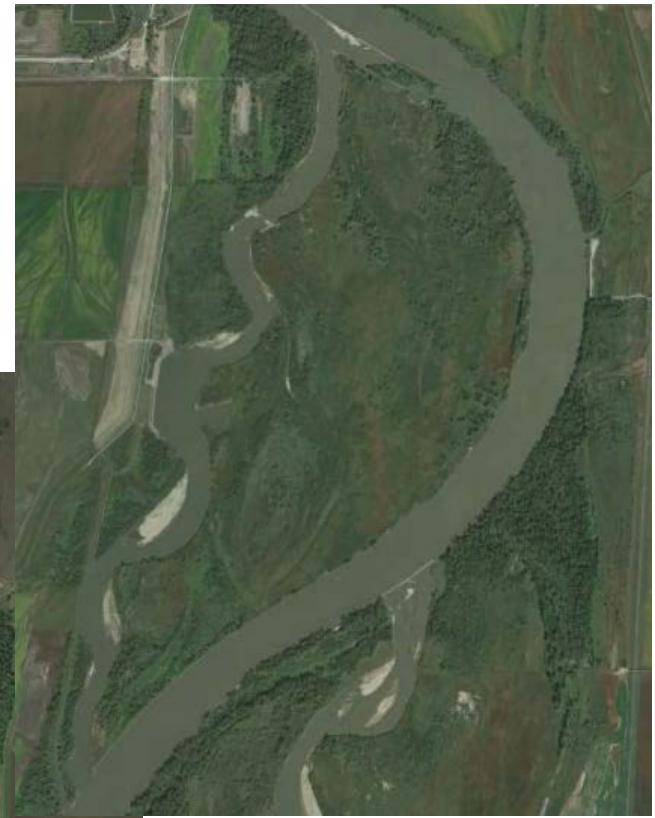
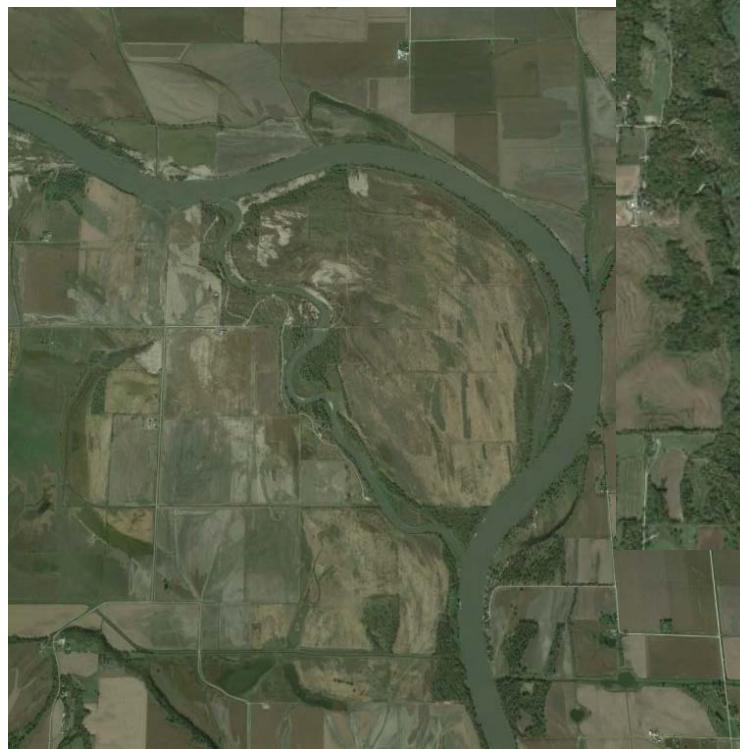
Emergent Sandbar Habitat



Shared habitat



Restoration

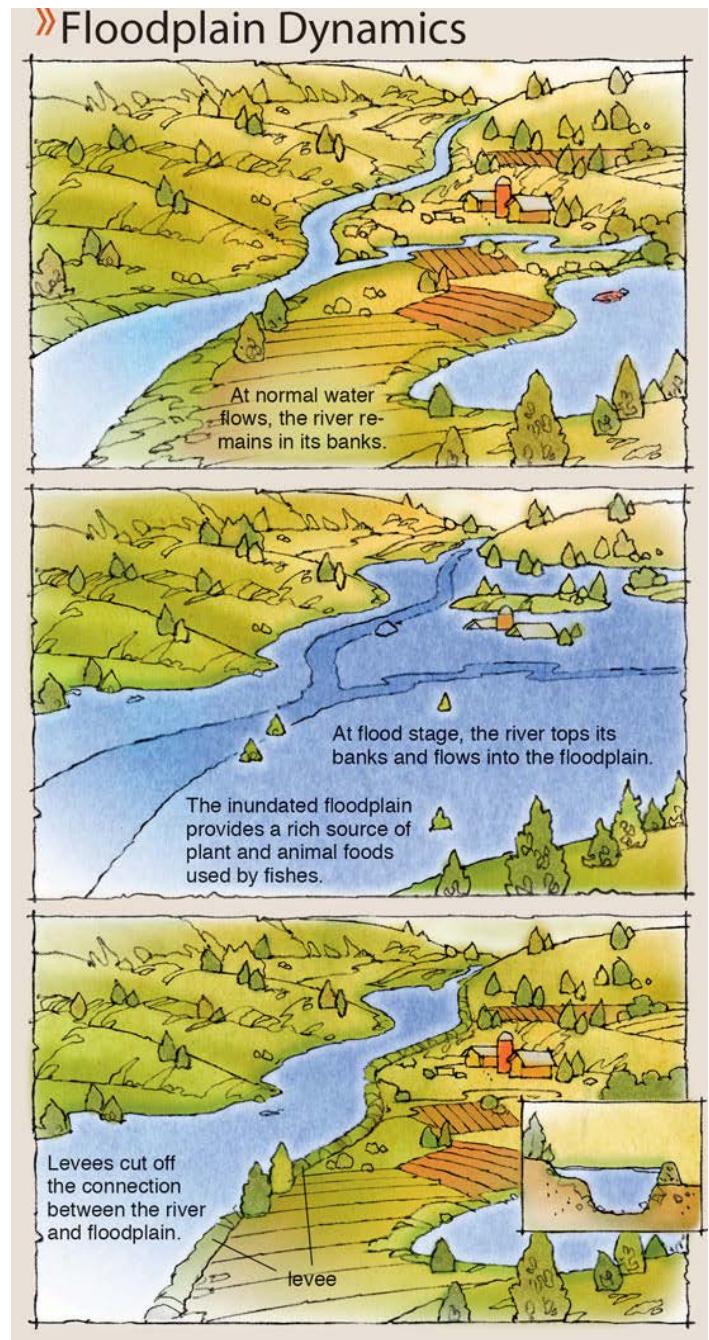


Floodplain connectivity



Floodplain dynamics

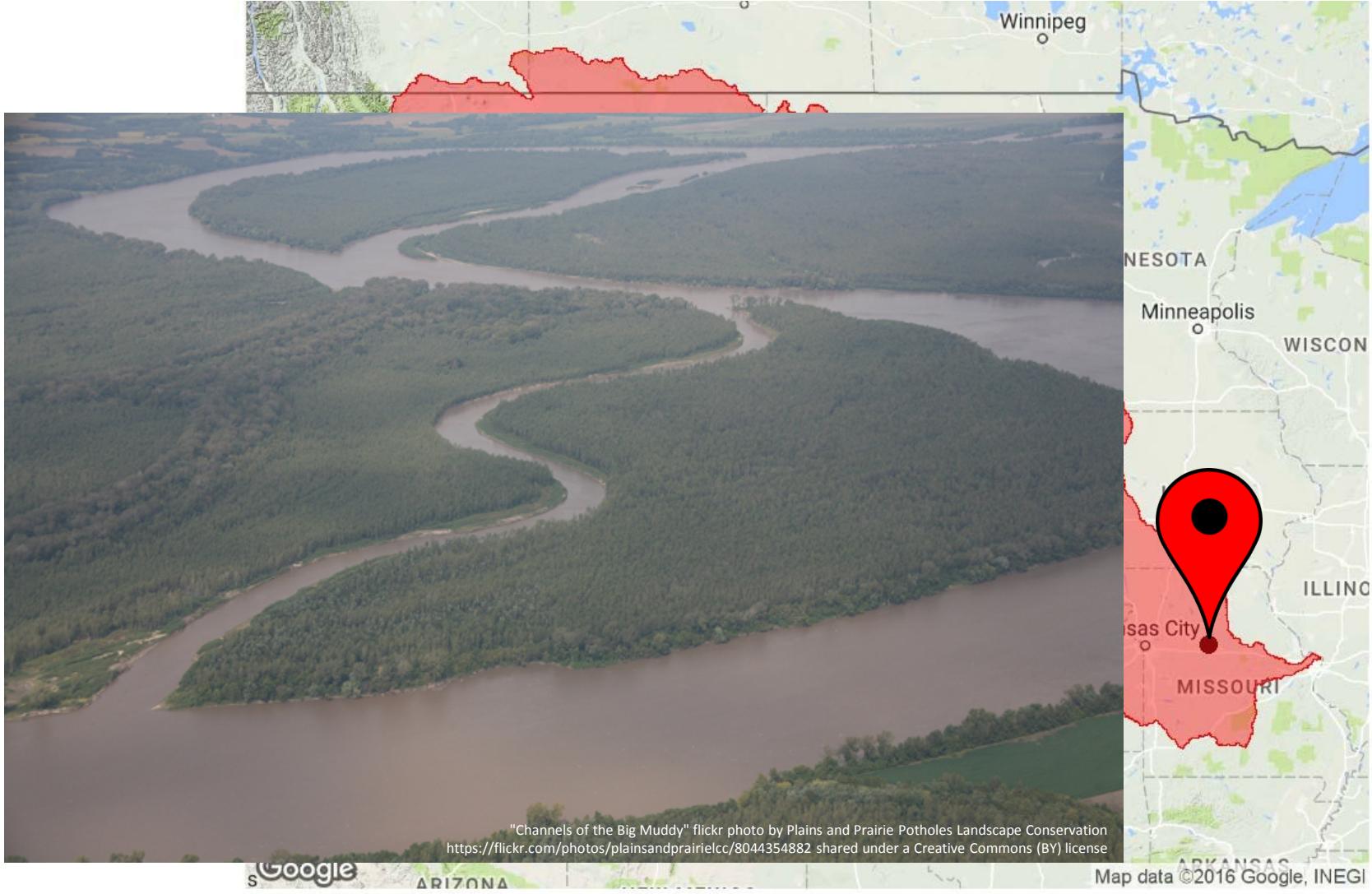
- Nutrient spiraling
- Dike notching



Floodplain connectivity



Habitat Restoration



Habitat Restoration

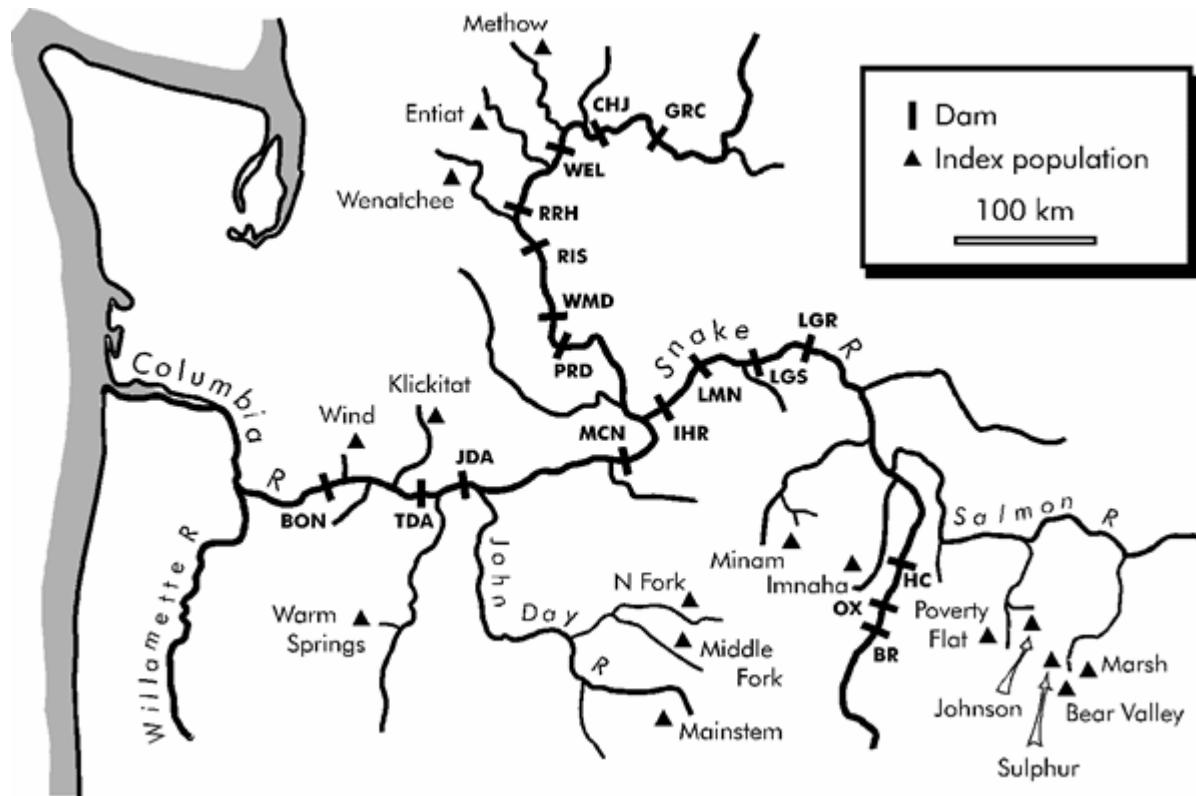


The background image is an aerial photograph of a coastal wetland. In the foreground, there is a dark green, irregularly shaped area of land or vegetation. Beyond it, the water is a light blue-grey. There are several long, narrow, light-colored sandbars or dredged material disposal sites extending from the shore into the water. The horizon shows distant land or hills under a clear sky.

RESTORATION, CONSERVATION, & MITIGATION EXAMPLE

Restoration, Conservation, & Mitigation Example

- Supplement population for lost habitat
- Example: Dams & anadromous fish



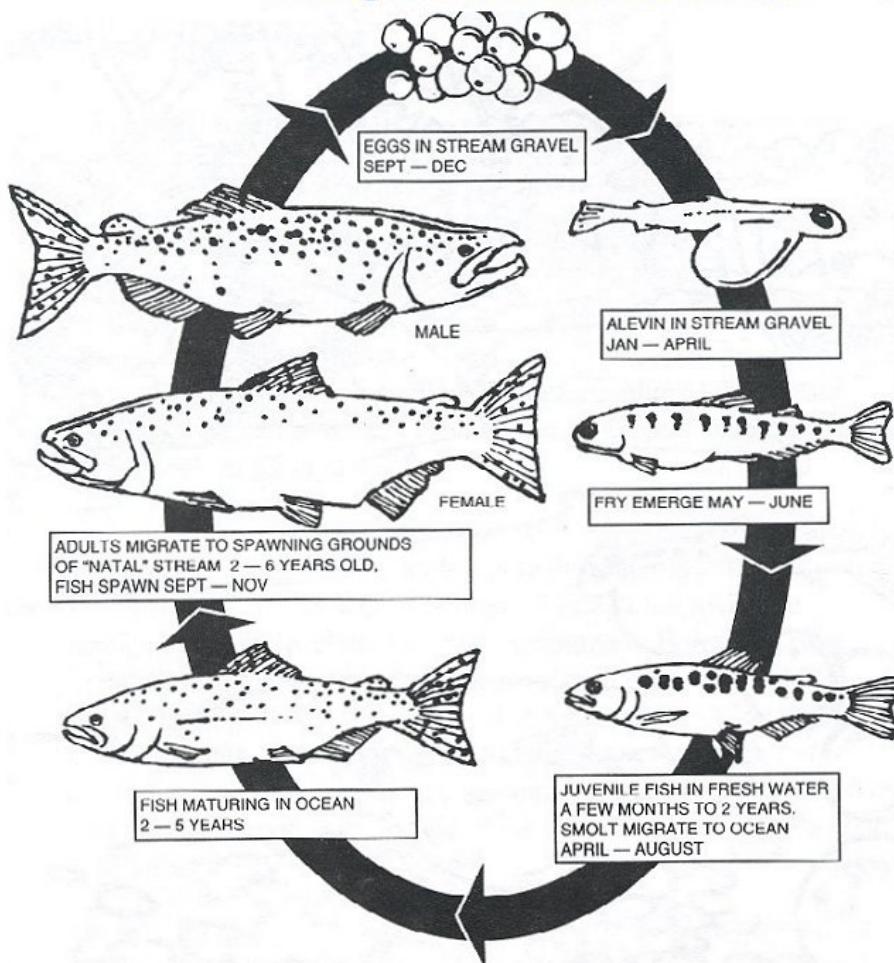
Columbia Basin



Anadromous life history



Life Cycle of Chinook Salmon



Habitat restoration

- Watershed improvements (land uses, strategic land acquisitions)
- Improve riparian corridors (Nutrients, sedimentation, thermal)
- Improve stream connectivity (stream reconnection, fish ladders, physical transport)

Pahsimeroi River

Land acquisition



Stream reconnection

