Monitoring & Adaptive Management Saves Money and Extends Functional Life of MRG Restoration Projects

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Projects

Sevilleta NWR to Socorro

Seven Sites

- Channelized river segment
- No overbank inundation <4,000 cfs
- Perennial flow

River Mile

• 120 Sevilleta Unit A' & B







Restoration Goal & Objectives

<u>Goals</u>:

- 1. Create and maintain off-channel nursery habitat for RGSM <u>at low-</u> moderate discharges (800-2,000 cfs)
- 2. Create conditions that promote passive recruitment of cottonwoodwillow

Design Objectives:

- 1. Low-velocity backwater habitats
- 2. Inundates (at least partially) every year during snow-melt runoff
- 3. Variable inundation depths
- 4. Drains during flood recession

Site RM 100.5

Site RM 99.5



Construction and As-Built Topo Surveys Completed in February 2019

≊USGS



Monitoring & AM Plan (GSA 2019)



March 14, 2019 1,250 cfs

April 23, 2019 2,350 cfs



RM 100.5





RM 112



Fyke Net Captures (data from SWCA)

Common Name	RM 100 FRS	RM 100.5 FRS	RM 112 FRS	RM 114 FRS	RM 100.8 NF	RM 106.5 NF
Rio Grande silvery minnow	17	144	43	30	68	137
red shiner	42	210	15	9	3	157
black bullhead			2			
channel catfish	1	3	1	2		
common carp						1
fathead minnow		1				
flathead chub		1				1
river carpsucker		2		1	1	3
western mosquitofish		4				
white sucker		1				
yellow bullhead			1			1
Grand Total	60	366	62	42	72	300

FRS = floodplain restoration sites

NF = natural floodplain

Reproductive Condition of Adult RGSM (data from SWCA)

Site	gravid	milt	spent	unknown	Grand Total
RM 100- FRS	11	3		3	17
RM 100.5 - FRS	59	49	16	20	144
RM 112 - FRS	12	30		1	43
RM 114 - FRS	10	18	2		30
RM 100.8 - NF	11	27	30		68
RM 106.5 - NF	3	56	2	76	137

FRS = floodplain restoration sites NF = natural floodplain

Vegetation Monitoring Results

	Proportion of Grid Cells Containing Exotic Woody Species					
Site	Saltcedar	Siberian Elm	Russian Olive	Any Exotic Species		
RM 114	29%	0%	13%	42%		
RM 112	11%	0%	6%	17%		
RM 100.5	24%	1%	10%	35%		
RM 100	26%	0%	3%	28%		
RM 99.5	19%	0%	9%	28%		
	Proportion of Grid Cells Containing Cottonwood/Willow Seedling					
Site	Cottonwood	Coyote Willow	Gooddings Willow	Cottonwood/Willow		
RM 114	19%	6%	1%	20%		
RM 112	12%	2%	1%	13%		
RM 100.5	12%	1%	0%	13%		
RM 100	12%	2%	0%	13%		

	Number of Noxious Weed Species Detections / Site				
Site	Canada thistle	Perennial		Russian	
		pepperweed	Ravenna grass	knapweed	Grand Total
RM 114					0
RM 112				15	15
RM 100.5		2			2
RM 100	1				1
RM 99.5			13		13
Grand Total	1	2	13	15	31

2%

0%

14%

13%

RM 99.5



Map & Quantify Sediment Deposition



2019 Sedimentation Depth: RM 114

Legend

Potential Channel Maintenance Zone Sediment Deposition Thickness (Feet) RM 114

Deposition: 3.3 0 Change Scour: 5.6

Depositon thickness based on calculating elevation difference between surfaces generated from RTK surveys after construction (as-builts) and after 2019 runoff (September 2019 surveys)







2019 Sedimentation Depth: RM 100.5

Legend

Potential Channel Maintenance Zone Sediment Deposition Thickness (Feet) RM 100.5

Deposition: 5.5 0 Change Scour: 3.8

Depositon thickness based on calculating elevation difference between surfaces generated from RTK surveys after construction (as-builts) and after 2019 runoff (September 2019 surveys)





Sediment Deposition vs. Volume Removed for Construction

		Volume Removed	Deposition at Inlets	% of Construction
Site	Acres	During Construction	Post-Inundation	Volume
RM 114	1.7	2,000	781	39%
RM 112	1.5	3,500	387	11%
RM 100.5	8.2	15,000	265	2%
RM 100	1.4	7,000	67	1%
RM 99.5	3.5	21,000	438	2%

 48,500 cu yds
 1,928 cu yds

 X \$5/cu yd
 X \$5/cu yd

 \$242,500
 \$9,640

Next Steps

Adaptive Management Actions:

- Control non-native plants
- Remove sediment plugs in channel inlets
- Continue annual monitoring
 program
 - Train SOBTF





Key "Year 1" Take Away Points

- Backwater designs are functioning as intended
 - Continue to work towards optimizing designs to reduce costs, maximize biological objectives, minimize sedimentation
- Deposition volumes are relatively small compared to construction volume

...but enough to reduce/prevent future functionality

- Saltcedar & noxious weeds won't disappear
- More cost effective to maintain existing projects than constantly building new ones
- Focused & well-designed monitoring program key
 - to guiding timely & cost-effective AM actions
 - ensuring project continues on desired trajectory
 - Retains long-term functionality

Considerations for MRGESCP

- MRG is a "novel ecosystem" (Hobbs et al 2006)
- Rehabilitation requires <u>long-term</u> stewardship commitment
- Strategy for long-term stewardship?
 - Funding
 - Community-based
 - Financial accountability

QUESTIONS?

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