SITE-SCALE RESTORATION PLANNING ON THE LOWER VIRGIN RIVER, NEVADA

MORMON MESA CASE STUDY

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CLARK COUNTY VIRGIN RIVER
RESERVE UNIT 1

- Goal: Develop a restoration plan to enhance and expand existing habitat for the SWFL and other MSHCP covered riparian birds
- 80 acre parcel
  - Existing Vegetation: Dense Tamarisk, scattered Goodding’s willow and a few other natives
Project Partners

- Clark County Desert Conservation Program
- Great Basin Institute
- Partners in Conservation
- Stillwater Sciences
- UC Santa Barbara
- Walton Family Foundation
VIRGIN RIVER
CONCLUSIONS FROM PHASE 1 ASSESSMENT

- **Hydro-geomorphology:** Virgin River is an episodic system prone to large, channel-resetting floods

- **Vegetation:** Tamarisk dominated in lower river and greater riparian diversity in upper river - **but vegetation will change** with defoliation and mortality from leaf beetle

- **Potential Active Restoration Sites:**
  - Lower River = 3,480 acres—expansive with greater continuity, co-occurrence with SWFL, opportunities on public lands
  - Upper River = 665 acres—smaller, isolated areas

- **Phase 2:** Plan and implement site-specific restoration projects
VIRGIN RIVER
STUDY AREA: MORMON MESA REACH
Potential Restoration Sites along the Lower River

3,480 acres
Recently Occupied SWFL habitat
Recently Occupied SWFL habitat
PHASE 2: REFINE PRIORITY AREAS FOR ACTIVE RESTORATION

Phase 1: Potential Restoration Areas

Flood Reset Zone (>33% frequency)

Vegetation Types (% native vs tamarisk)

Phase 2: Refinement Using Reach- and Site-scale Data

Soils

Depth to Groundwater (Relative Elevation)

Vegetation Structure

SWFL Habitat
CLARK COUNTY VIRGIN RIVER UNIT 1
INITIAL PHASE

Ecohydrological Assessment

- Reach- and site-scale assessment
- Relative elevation mapping
- Vegetation canopy height
- GIS analysis for identification of restoration zones, priorities and strategies
- Field surveys
  - Vegetation mapping
  - Surface water and soil assessment

Site Restoration Plan

- Botanical inventory
- Map of planting zones
- Recommendations for each restoration zone
  - Plant mix – species, density,
  - Restoration methods, source material
  - Plant requirements – tolerances for salinity, shade, water
  - Cattle exclusion
  - Weed management
CLARK COUNTY VIRGIN RIVER UNIT 1 INITIAL PHASE

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Virgin Valley: Mormon Mesa Reach
Active Channel Frequency: Flood Reset Zone
Phase 1 Potential Restoration Areas

Active channel frequency (5 year scenario)
- <20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- >80%

Active channel frequency (3 year scenario)
- >70%
- 30 - 70%
- <30%

Potential priority areas for active restoration
Existing/proposed restoration site
Public ownership
Southwestern willow flycatcher habitat
- past occupancy
- 2011 occupancy

Rock wall
Existing erosion protection
River structure

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Imagery Date: 5/23/2013
lat 36.621965° lon
Recently Occupied SWFL Habitat

Active channel frequency (5 year scenario)
- <20%
- 20 - 40%
- 40 - 60%
- 60 - 80%
- >80%
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- 30-70%
- <30%
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SITE SURVEYS

- **September 2013 - UCSB Field Surveys**
  - Vegetation composition and structure
  - Surface water and soil moisture
  - Soil texture, salinity, and pH
  - Site access routes
  - Field validation of remote sensing/GIS data

- **October 2013 - GBI Field Reconnaissance**
  - Refine site access and other logistics
  - Refine site plan for 2013/2014 priority areas
  - Set priorities for initial tamarisk clearing and treatment
CHALLENGE: HOW TO KEEP OUT CATTLE?
BUILD A WALL OF TAMARISK!
PATCH D: OCTOBER 2013
PATCH G: 13 FEB 2014
IMPLEMENTATION OF PLANTING PLAN

Cleared and Treated Tamarisk (completed)
• Path to 7 locations
• 6 planting areas
• Created cattle exclusion
• Oct 2013 - Jan 2014
• Great Basin Institute
• Walton Family Foundation

Revegetation Initial Phase (in progress)
• Winter/Spring 2014
• Collect and plant willow and cottonwood poles and cuttings
• Plant native understory species
• Install fencing
• Weed control
• Monitoring, experimental plantings, and adaptive learning for later phases
FOR ADDITIONAL INFORMATION...

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Stillwater Sciences Website
www.stillwatersci.com

Virgin River Science Team
http://rivrlab.msi.ucsb.edu/VR_data/virginriver.php
EXTRA SLIDES
30 Control Plots (>60% Tamarisk cover)
35 Treatment Plots (<5% Tamarisk cover)

• Each plot 6.25 ha

STUDY DESIGN:

Propagule Islands Restoration Strategy

Restoration Islands ↓
RESTORATION PRIORITY AREAS