INVASIVE SPECIES MANAGEMENT OPTIONS FOR THE DOS PALMAS AREA

Revised Draft Report

June 9, 2009

Overview

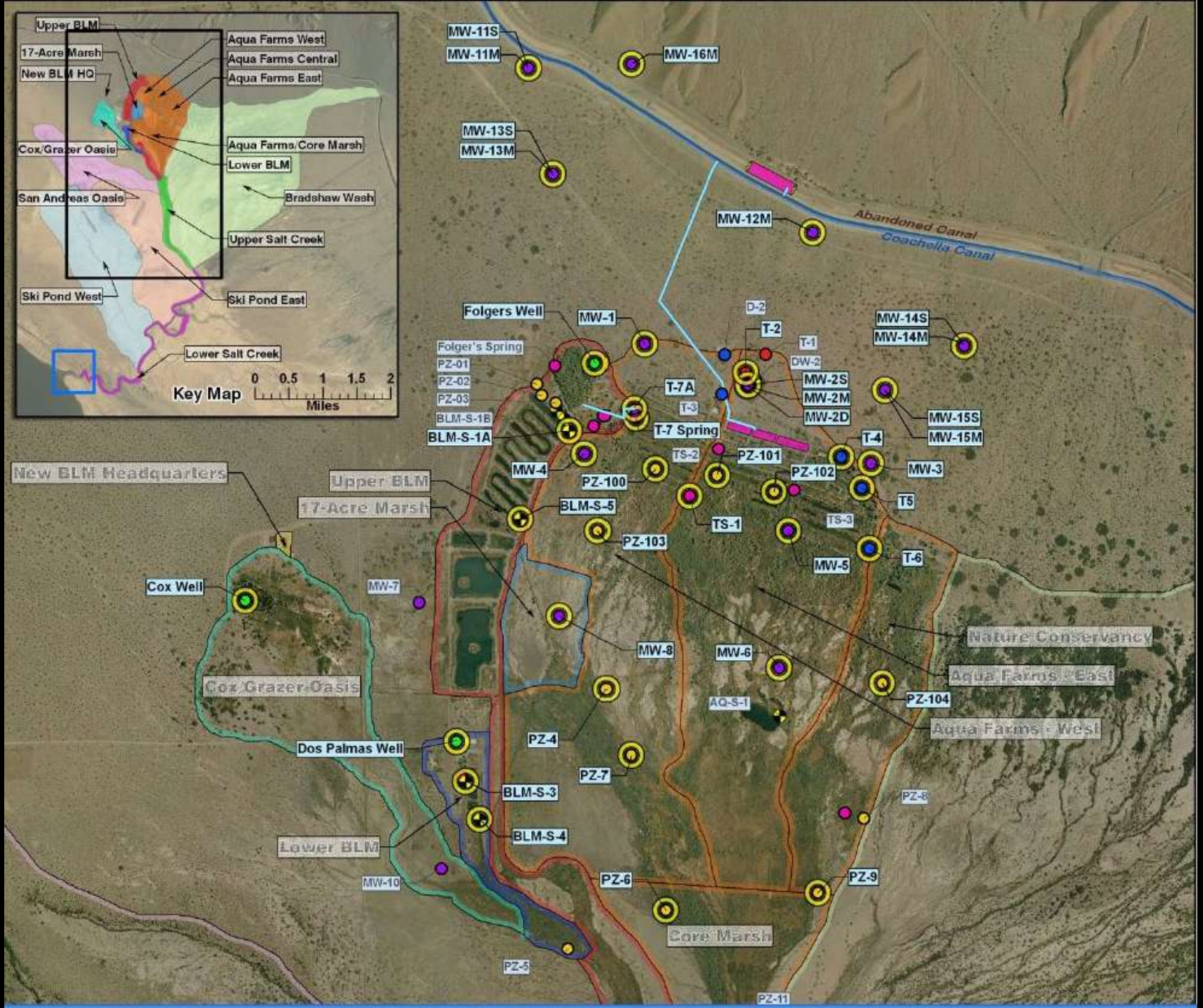
- Background
- Site Characterization
- Species Biology
- Invasive Species Distribution
- Invasive Species Control Techniques
- Data Gaps

Background

- Institutional
  - Land Ownership
    - BLM, CDFG, CNLM, Parks
  - Commitments
    - CVCC, CVWD
  - Agency Concerns
    - CDFG, USFWS
- Regulatory
  - ESA and CESA
    - Coachella Valley MSCP (prescribed actions)
    - Coachella Canal Lining (mitigation commitment)
  - Work in Waters of the State
  - Others, TBD

Site Characterization

- Physical
  - Climate
  - Modified landforms
  - Fault-mediated hydrology
  - Native springs & artesian wells
  - Multiple aquifers
- Biological
  - Historical site with recent increases in area of palm oasis and marsh habitats
  - Significant endemics and rare species
  - Numerous invasives


Upper BLM
17-Acre Marsh
New BLM HQ
Aqua Farms West
Aqua Farms Central
Aqua Farms East
Cox/Grazer Oasis
Aqua Farms/Core Marsh
Lower BLM
San Andreas Oasis
Bradshaw Wash
Upper Salt Creek
Ski Pond West
Ski Pond East
Lower Salt Creek
Key Map
0 0.5 1 1.5 2
Miles
MW-11S
MW-11M
MW-16M
MW-13S
MW-13M
MW-12M
Abandoned Canal
Coachella Canal
Folgers Well
MW-1
D-2
T-2
T-1
DW-2
MW-14S
MW-14M
Folger's Spring
PZ-01
PZ-02
PZ-03
BLM-S-1B
BLM-S-1A
T-7A
T-3
T-7 Spring
MW-2S
MW-2M
MW-2D
MW-15S
MW-15M
T-4
MW-3
T5
TS-2
PZ-101
PZ-102
MW-4
PZ-100
TS-1
TS-3
MW-5
T-6
New BLM Headquarters
Upper BLM
17-Acre Marsh
BLM-S-5
PZ-103
Cox Well
MW-7
MW-8
MW-6
Nature Conservancy
Aqua Farms - East
PZ-104
AQ-S-1
Aqua Farms - West
Cox/Grazer Oasis
PZ-4
Dos Palmas Well
PZ-7
BLM-S-3
BLM-S-4
PZ-8
Lower BLM
MW-10
PZ-6
PZ-9
Core Marsh
PZ-5
PZ-11

Species Biology

- Species of Concern
  - Desert Pupfish
  - Yuma Clapper Rail
  - California Black Rail
  - unspecified endemics
- Invasive Species
  - Mosquitofish
  - Mollies
  - Tilapias
  - Rio Grande Leopard Frogs & Bullfrogs
  - Crayfish
  - Melania snails
  - others

Invasive Species Distribution

- Headwater Ponds
  - Includes both original and created pools with both spring and piped water sources
- Headwater Wetlands
  - Spring-fed “squishy” areas likely have interconnected hydrology
- Salt Creek Channels
  - Extensive, structurally complex and hydrologically diverse downstream habitats extending to the Sea

Invasive Species Control Techniques

- Water Management
- Channel Creation
- Shallow Water Habitat Creation
- Clearing
- Burning
- Trapping
- Pesticide

Evaluation Criteria

- Efficacy: How effective is it on various species?
- Scientific Feasibility: How do we know it will work?
- Risk: How bad can it get if things go wrong?
- Regulatory Feasibility: How easy is it to permit?
- Economic Feasibility: Is it worth the cost?
- Interactions: Does it affect other control techniques or ongoing programs at Dos Palmas?
- Monitoring: What's necessary / appropriate?

Water Management: Dry it out

Water Management

Pros

- Technically feasible
- Creates new habitat
- Invasives are sensitive to desiccation, must disperse to recolonize
- Pupfish are early seral with huge population growth potential
- Low risk

Cons

- Crayfish are good dispersers with high population growth potential
- Requires active management in perpetuity
- May be water supply issues
- Creates volatile pupfish population

Channel Creation

Pros

- Enhances existing degraded habitat
- Shows well for risk, economics
- Widely accepted approach to aquatic habitat enhancement
- Low maintenance supports Tier 2 goal

Cons

- Pupfish ecology data gap requires some research before technique can be field tested
- Benefit is smaller – percentages rather than order of magnitude

Shallow Water Habitat Creation

Pros

- Increases habitat area available to pupfish
- Plays to pupfish ecological strengths
- Low risk, low cost
- Can be implemented right away
- Good set-up for field experimentation

Cons

- Data gaps in scientific feasibility: Novel idea, may have hidden "surprises"
- Requires monitoring and maintenance
- By itself, not a sufficient solution

Clearing / Burning

Pros

- Easy to do
- May complement other techniques
- Probably favors pupfish over mollies, tilapia and amphibians
- OK short-term economics

Cons

- High incidental take risk
- Low efficacy on snails and crayfish, which rebound quickly
- Regulatory hurdles for burning
- Benefits only last a year or two, so cumulatively expensive

Trapping / Pesticide

Pros

- Trapping may temporarily reduce the number of large invasives (amphibians, tilapia, and crayfish mainly)

Cons

- Low efficacy, high cost
- Effects are temporary
- Pesticide may harm all sensitive species known at Dos Palmas
- Impossible to treat all waters with pesticide
- Pesticides that can kill molluscs also kill almost every other living thing

Data Gaps

- Understanding of the Dos Palmas ecosystems:
  - What are the seasonal distributions of pupfish and invasive species?
  - What are their environmental needs and tolerances?
  - How does the hydraulic system at the site function in a dynamic (seasonal and year-to-year) context?
  - What are the characteristics of the pupfish genetic stock at Dos Palmas?

Data Gaps

- Water Management
  - Determine whether pupfish tolerate desiccation
  - Characterize optimal desiccation regime to manage invasives
  - How extensive a pond network is feasible given the available water supply and existing needs / commitments?
  - Best procedures to manage pupfish between ponds – capture, holding, reintroduction to a recently wetted pond?

Data Gaps

- Channel Creation
  - Need to further study Salt Creek and perhaps other pupfish habitats to fully understand how pupfish successfully maintain a viable population in the presence of the full suite of invasive species
- Shallow Water Habitat Creation
  - Experiments (in field setting) to determine optimum raft size, placement, construction, anchoring, depth of inundation, substrate material, plant materials if any, topographic features if any, design of border or perimeter, etc.

Data Gaps

- Clearing
  - Field experimentation to quantify efficacy and risk
- Burning
  - Field experimentation to measure change in pupfish and invasive species habitat suitability
  - If pupfish are desiccation tolerant, does burning eliminate that advantage?
- Trapping
  - Does it even have a measurable effect?
  - Does crayfish trapping harm rails?

Discussion