

# City of San Diego Vernal Pool Habitat Conservation Plan

August 30, 2012  
Public Workshop

# Agenda

- Welcoming Remarks
- VP HCP Planning Agreement
- VP Focal Species
- Status of VP HCP
- Vernal Pool Planning Area
- **Technical White Papers**
- **Questions and Answers**

# VPHCP Planning Agreement

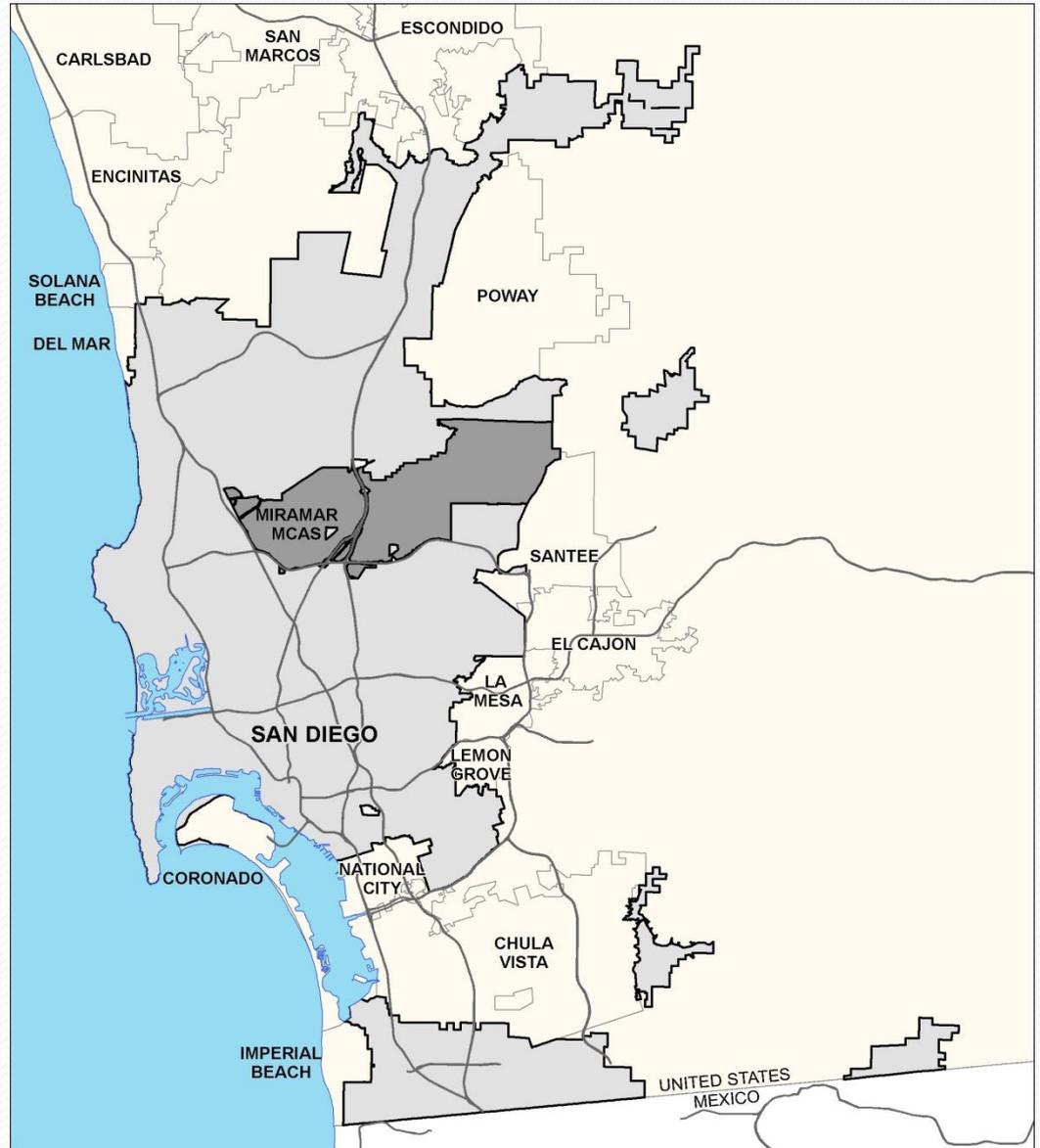
- Signed in October 2009 between City of San Diego and USFWS
- Planning Agreement outlines preparation of HCP
  - Provide for the protection of vernal pool focal species;
  - Preserve the diversity of vernal pool plant and animal species
  - Minimize and mitigate the incidental take
  - Identify and designate vernal pool preserve areas;
  - Insure that activities are not likely to jeopardize the continued existence of any endangered or threatened vernal pool species;
  - Reduce the need to list additional vernal pool species; and
  - Implement species-specific and habitat-based goals and objectives for the protection of vernal pool species

# Vernal Pool Focal Species

- Otay Mesa mint (*Pogogyne nudiuscula*)
- San Diego Mesa mint (*Pogogyne abramsii*)
- Spreading navarretia (*Navarretia fossalis*)
- San Diego button-celery (*Eryngium aristulatum* var. *parishii*)
- California Orcutt grass (*Orcuttia californica*)
- Riverside fairy shrimp (*Streptocephalus wootoni*)
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)
- ~~Little mousetails (*Myosurus minimus*)~~



# VP HCP Planning Area



# Status of VP HCP

DATE	MILESTONES
January 14, 2011	Public Workshop: VP HCP Kickoff meeting
June 14, 2011	Contract with AECOM finalized to prepare 7 TWPs
July 14, 2011	Range of Alternatives Developed by City and Agencies
October 29, 2011	Selection of Scientific/Expert Advisors to review TWPs
November 12, 2011	Public Workshop: EIR Notice of Preparation
February 24, 2012	Creation of Draft Vernal Pool Geodatabase for Analysis
March 15, 2012	Public Workshop: VP HCP Preserve Alternatives
August 23, 2012	Completion of TWPs 1-6 and Scientific Review
<b>August 30, 2012</b>	<b>Public Workshops: TWPs 1-6</b>
February 2013	Draft VP HCP & Draft EIR/EIS for Minimum 60 Day Public Review
April 2013	Public Workshop: Land Use and Housing
July 2013	Final Draft VP HCP & Final EIR/EIS; Begin hearing process

# Technical White Papers (TWP)

- TWP 1: Focal species status
- TWP 2: Assessment of focal species conservation
- TWP 3 & 4: Adaptive management and monitoring strategy
- TWP 5: Cost evaluation for implementation of management and monitoring program
- TWP 6: Recommendations for conditions of coverage

# Introduction

- Scott McMillan, AECOM
- Lindsey Cavallaro, AECOM

# Technical White Papers

to Support SANDAG Service Bureau's Preparation of the  
City of San Diego's  
Vernal Pool Habitat Conservation Plan

Lindsey Cavallaro, M.S., AECOM  
Scott McMillan, AECOM

# Presentation Overview

- Terms & Acronyms
- Purpose and Overview of Technical White Papers
- Technical White Paper preparation approach and process
- Summary and Status of Technical White Papers
- Questions

# Terms & Acronyms

- TWP – Technical White Paper
- City – City of San Diego
- CDFG – California Department of Fish and Game
- VPHCP – City’s Vernal Pool Habitat Conservation Plan
- VPHCP Planning Area - Jurisdictional boundary of the City plus three “cornerstone” areas owned by the City’s Public Utilities Department in unincorporated San Diego County
- USFWS – US Fish and Wildlife Service
- SANDAG SB – San Diego Association of Governments Service Bureau
- WLAs – Wildlife Agencies (USFWS and CDFG)



# Purpose of Technical White Papers

To support SANDAG SB's preparation of the City's VPHCP by synthesizing, analyzing, and presenting existing available data on the City's vernal pools and seven focal species.

# Otay Mesa mint (*Pogogyne nudiuscula*)



# San Diego mesa mint (*Pogogyne abramsii*)



# Spreading navarretia (*Navarretia fossalis*)



# San Diego button-celery (*Eryngium aristulatum* var. *parishii*)



# California Orcutt's grass (*Orcuttia californica*)



# Riverside fairy shrimp (*Streptocephalus wootoni*)



Photograph: C. Brown, USGS

# San Diego fairy shrimp (*Branchinecta sandiegonensis*)



# VPHCP Technical White Paper Topics

- TWP 1: Focal Species Status Update in the City of San Diego
- TWP 2: Assessment of Focal Species Conservation
- TWPs 3 & 4: Adaptive Management and Monitoring Strategy (a combined document)
- TWP 5: Cost Evaluation for Implementation of Management and Monitoring
- TWP 6: Recommendations for Conditions of Coverage
- *TWP 7: Conservation Analysis (To Be Prepared)*
- *TWP 8: Preserve Management Funding Mechanisms (SANDAG SB)*

# VPHCP Technical White Paper Process

- AECOM prepared Draft TWPs using available scientific data/information and best expert opinion
- Draft TWPs reviewed by SANDAG SB, City, and WLAs
- Substantive comments were incorporated, per direction from SANDAG SB
- Revised Draft TWPs were reviewed by Scientific Advisors
- Substantive comments were incorporated, per direction from SANDAG SB
- Final Draft TWPs provided to the public for review and comment
- Substantive public comments will be addressed in the VPHCP

# VPHCP Technical White Paper Process

## Scientific Advisory Committee

- Ellen T. Bauder, Ph.D.
- Marie Simovich, Ph.D.
- Andrew J. Bohonak, Ph.D.
- Mark Doderer, M.S.
- Paul Fromer, M.S.
- Christina M. Schaefer, MLA, M.S.

# VPHCP Technical White Paper Process

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# VPHCP Technical White Papers

*“Please note that the Technical White Papers are the products of professional consultants hired by SANDAG Service Bureau, and that the City of San Diego and/or Wildlife Agencies may not concur with the recommendations contained in these reports.”*

# Technical White Paper 1

Focal Species Status Update in the City of  
San Diego

# Technical White Paper 1

## Focal Species Status Update in the City of San Diego

- Synthesizes and summarizes existing, available information on the City's vernal pools and seven focal species
- Several key sources for data and information:
  - City's vernal pool geodatabase (February 2012)
  - Beauchamp and Cass (1979)
  - Bauder (1986)
  - Bauder and McMillan (1998)
  - City of San Diego Vernal Pool Inventory (2004)
  - USFWS 5-year Reviews (various dates)
  - USFWS Recovery Plan (1998)
  - Other pertinent references
- No new fieldwork or QA/QC of data accuracy
- Not an update to the USFWS Recovery Plan

# Technical White Paper 1

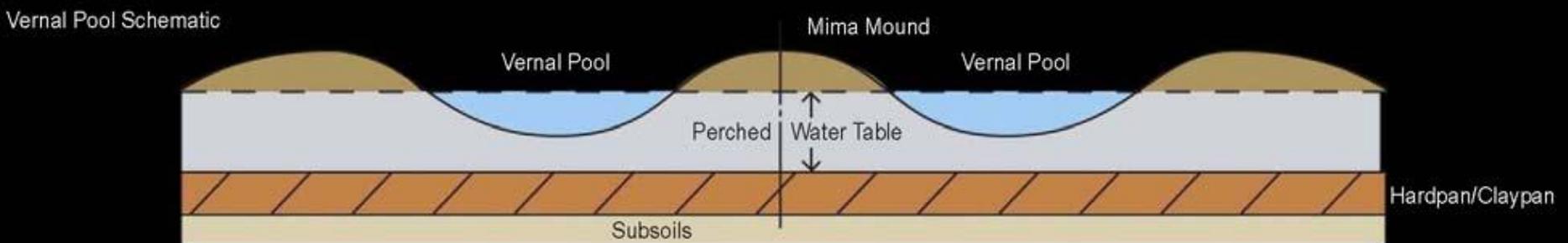
## Focal Species Status Update in the City of San Diego

- 10,668 vernal pools in the VPHCP Planning Area
- 3,137 vernal pools (over 58 acres of basin) within the VPHCP Planning Area were analyzed in TWP 1 (includes all pools but those on MCAS Miramar)
- 7,531 vernal pools occur on MCAS Miramar, which are not analyzed in the TWPs because data is restricted and not within the City's jurisdiction
- MCAS Miramar vernal pool data is in the Integrated Natural Resources Management Plan (2011)

# Technical White Paper 1

## Focal Species Status Update in the City of San Diego

- What is a vernal pool?
  - No field verification of vernal pool designation in the vernal pool database
- What is a vernal pool “complex”?
  - Geographically and biologically defined



# Technical White Paper 1

## Focal Species Status Update in the City of San Diego

### Historic and current status of vernal pools in San Diego

- Approximately 95-98% of San Diego County vernal pool habitat has already been lost
- Approximately 68% of vernal pools on private lands within the City were lost between 1979 and 1986 (USFWS 1998)
- Less than 10% of vernal pools on private lands within the City were lost between 1986 and 1996 (USFWS 1998)
- Since 1998, a 15% (approximately 500 pools) increase has occurred in the number of pools in the City from habitat restoration and enhancement

# Technical White Paper 1

## Focal Species Status Update in the City of San Diego

TWP 1 summarizes information for each focal species including:

- Listing Status
- Species Description
- Habitat
- Life Cycle
- Status and Distribution
- Threats and Pressures
- Propagation and Restoration Potential
- Status in Study Area

# Technical White Paper 1

## Focal Species Status Update in the City of San Diego

- Historically, development was the major threat to vernal pools
- Today, majority of remaining vernal pools are protected
- Main threats to vernal pools and focal species today that need to be addressed through management:
  - Invasive weeds
  - Hybridization of shrimp species

# Technical White Paper 1

## Focal Species Status Update in the City of San Diego

Focal Species	Critical Habitat Acres in VPHCP Planning Area*	Number of Occupied Pools in VPHCP Planning Area*	Estimated % Restored Pools
Otay Mesa mint	None	398 (12.7%) within 7 complexes	99.8 (All but 1 pool)
San Diego mesa mint	None	368 (11.7%) within 17 complexes	10 or less
Spreading navarretia	624 acres	112 (3.6%) within 10 complexes	~ 80
San Diego button-celery	None	860 (27.4%) within 26 complexes	~ 45
California Orcutt's grass	None	61 (1.9%) within 4 complexes	~ 90

\* Does not include vernal pools on MCAS Miramar

# Technical White Paper 1

## Focal Species Status Update in the City of San Diego

Focal Species	Critical Habitat Acres in VPHCP Planning Area*	Number of Occupied Pools in VPHCP Planning Area*	Estimated % Restored Pools
Riverside fairy shrimp	847 acres proposed	215 (6.9%) within 12 complexes	~ 95
San Diego fairy shrimp	1,834 acres	678 (21.6%) within 42 complexes	~ 60

\* Does not include vernal pools on MCAS Miramar

- Data for plant species is considered relatively complete
- Data for shrimp occupancy is likely incomplete and underestimated due to lack of protocol surveys

# Technical White Paper 2

## Assessment of Focal Species Conservation

# Technical White Paper 2

## Assessment of Focal Species Conservation

- Evaluate conservation of vernal pools and focal species provided by the proposed VPHCP Preserve and two alternative Preserve boundaries
- Based on the Vernal Pool Database (February 2012)
- Determine consistency with the USFWS Recovery Plan (Appendices F and G)
- Identify “gaps” in conservation under the three alternatives
- Results are used in TWP 6 to determine conditions of coverage for the focal species

# Technical White Paper 2

## Assessment of Focal Species Conservation

### VPHCP Preserve Alternative Boundaries

- Project – Proposed VPHCP Preserve; includes Alternative 1 plus additional lands that include vernal pools
- Alternative 1 (Baseline) – Existing lands within City’s Multi-Habitat Planning Area (MHPA) plus conserved lands
- Alternative 2 (Expanded Conservation) – the Project, plus additional lands generally on Del Mar Mesa and Otay Mesa

# Technical White Paper 2

## Assessment of Focal Species Conservation

City Jurisdiction and Preserve Status	Number Of Pools		
<b>VPHCP Planning Area (Total of A through E)</b>	<b>10,668</b>		
A. MCAS Miramar	7,531		
B. - E. Vernal Pools Analyzed in TWP 1	3,137		
	<b>Project</b>	<b>Alt 1</b>	<b>Alt 2</b>
<b>VPHCP Preserve (B + D)</b>	<b>2,861</b>	<b>2,201</b>	<b>2,898</b>
B. Inside Preserve, Not Subject to City's Jurisdiction	678	557	680
C. Outside Preserve, Not Subject to City's Jurisdiction	130	251	128
D. Inside Preserve, Subject to City's Jurisdiction	2,183	1,644	2,218
E. Outside Preserve, Subject to City's Jurisdiction	146	685	111
<b>Pools Subject to City Jurisdiction in TWP 2 Conservation Analysis (D + E)</b>	<b>2,329</b>	<b>2,329</b>	<b>2,329</b>

# Technical White Paper 2

## Assessment of Focal Species Conservation

Analysis of each vernal pool complex in the VPHCP Preserve for each alternative, including:

- Conservation level (0, 75, 94, or 100%)
- Ownership/land control
- Number and surface area of vernal pools conserved
- Presence of critical habitat
- Number of pools occupied with focal species
- Consistency with the USFWS Recovery Plan (Appendices F and G)

# Technical White Paper 2

## Assessment of Focal Species Conservation

Alternative	# of Pools Subject to City's Jurisdiction	# of Complexes within Preserve Subject to City's Jurisdiction	# of Pools Conserved within Preserve Subject to City's Jurisdiction	# of Pools Conserved within Preserve Based on Conservation Level*	# of Pools Lost to Development (Inside and Outside of Preserve) Based on Conservation Level*	Consistent with USFWS Recovery Plan for Stabilizing Focal Species <sup>1</sup>	Consistent with USFWS Recovery Plan for Reclassifying Focal Species <sup>2</sup>	% Vernal Pools Conserved in City's Jurisdiction Based on Conservation Level*
<b>Project</b>	2,329	53	2,183	2,109	220 (146 Outside/ 74 Inside)	Yes	Yes	90.6
<b>Alternative 1 – Baseline</b>	2,329	37	1,644	1,621	708 (685 Outside/ 23 Inside)	No	No	69.6
<b>Alternative 2 – Expanded Conservation</b>	2,329	53	2,218	2,133	196 (111 Outside/ 85 Inside)	Yes	Yes	91.6

\*Pools and species population conserved is based on 0%, 75%, 94%, and/or 100% conservation level by vernal pool complex.

<sup>1</sup> Conserves the complexes identified in Appendix F of the USFWS Recovery Plan (1998) as “necessary to stabilize” the focal species.

<sup>2</sup> Conserves the complexes identified in Appendix G of the USFWS Recovery Plan (1998) as “necessary to reclassify” the focal species.

# Technical White Paper 2

## Assessment of Focal Species Conservation

Alternative	% Occupied Pools Conserved in Preserve Subject to City's Jurisdiction*						
	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS
<b>Project</b>	100	96.9	98.9	99.0	100	99.1	87.9
<b>Alternative 1 – Baseline</b>	100	79.0	98.9	93.7	100	96.0	79.2
<b>Alternative 2 – Expanded Conservation</b>	100	96.9	98.9	99.3	100	99.1	88.3

\*Pools and species population conserved is based on 75%, 94%, and/or 100% conservation level by vernal pool complex.

PONU = Otay Mesa mint  
 POAB = San Diego mesa mint  
 NAFO = Spreading navarretia  
 ERAR = San Diego button-celery

ORCA = California Orcutt grass  
 RFS = Riverside fairy shrimp  
 SDFS = San Diego fairy shrimp

# Technical White Paper 2

## Assessment of Focal Species Conservation

Critical Habitat	NAFO Critical Habitat Acres	Proposed RFS Critical Habitat Acres	SDFS Critical Habitat Acres
<b>Total Critical Habitat Acres in City's Jurisdiction</b>	624	847	1,834
<b>Critical Habitat Conserved by Alternative<sup>1</sup></b>	<b>Total and % Acres Conserved</b>		
<i>Project</i>	575 (92.3%)	777 (91.8%)	1,475 (80.4%)
<i>Alternative 1 – Baseline</i>	517 (82.9%)	724 (85.5%)	1,287 (70.1%)
<i>Alternative 2 – Expanded Conservation</i>	597 (95.7%)	784 (92.6%)	1,613 (87.9%)

<sup>1</sup> Based on conservation level (75%, 94%, or 100%).

NAFO = Spreading navarretia

RFS = Riverside fairy shrimp

SDFS = San Diego fairy shrimp

# Technical White Paper 2

## Assessment of Focal Species Conservation

Alternative	Number of Pools Lost Outside the Preserve	Total Surface Area of Pools Lost Outside the Preserve (Acres)	Occupied Focal Species Pools Lost Outside the Preserve							Lost Complexes Identified by USFWS Recovery Plan as Necessary to:	
			PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS	Stabilize Focal Species Populations <sup>1</sup>	Reclassify Focal Species Populations <sup>2</sup>
<b>Project</b>	146	7.14	0	0	1	5	0	1	49	None	None
<b>Alternative 1 – Baseline</b>	685	14.61	0	51	1	38	0	5	100	F 6-17, J13 S, J20-21, and J21	I1, I6 C, I6 B, U15, and U19
<b>Alternative 2 – Expanded Conservation</b>	111	6.14	0	0	1	3	0	1	46	None	None

Note: Pools and complexes lost outside the VPHCP Preserve are 0% conserved.

<sup>1</sup> Conserves the complexes identified in Appendix F of the USFWS Recovery Plan (1998) as “necessary to stabilize” the focal species.

<sup>2</sup> Conserves the complexes identified in Appendix G of the USFWS Recovery Plan (1998) as “necessary to reclassify” the focal species.

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

- Purpose: To develop a monitoring and management strategy that evaluates whether the VPHCP goal and objectives are being achieved
- TWP 3 & 4 is intended to guide development of the City's Vernal Pool Management and Monitoring Plan (VPMMP)
- The City will develop complex-specific management directives based on the strategy of the VPMMP

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

What are the VPHCP goal and objectives?

- Biological Goal: Contribute to the recovery of and ensure continued persistence of the VPHCP focal vernal pool species populations by implementing the identified objectives
- Complex-based (i.e., habitat) objectives
  - Conserve vernal pools in perpetuity
  - Manage and restore complexes
- Focal species-specific objectives
  - Conserve, manage, and restore focal species populations by complex

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

- Monitoring and management program developed to:
  - Be adaptive
  - Be efficient
  - Be implementable by City staff (where appropriate)
  - Be repeatable
  - Provide information needed to guide management
- Information obtained during monitoring will guide management decisions for each complex and the focal species that occupy it

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

- The monitoring and management program is NOT intended for:
  - Exhaustive data collection
  - Implementation by only technical experts
  - Advanced/complex statistical analysis
- Data can be aggregated to support regional population trend analysis, but is not related to the VPHCP goals and objectives

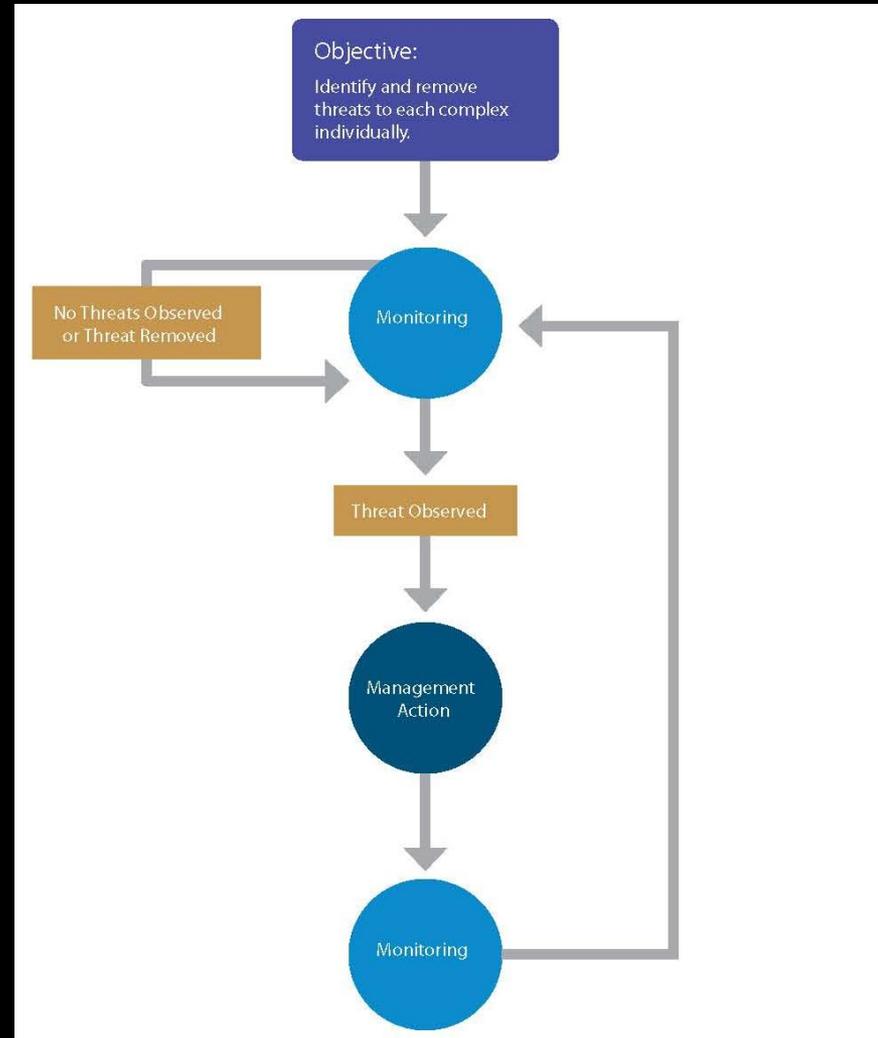
# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

- Reviewed City's existing vernal pool management plan
- Reviewed and compared existing methods for vernal pool/wetland monitoring
  - Hydrogeomorphic Model (HGM)
  - California Rapid Assessment Method (CRAM)
  - USFWS Fairy Shrimp Protocol
- Incorporated relevant and applicable elements
- Developed adaptive monitoring/management approach based on 15+ years of field experience

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy



# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

### Monitoring a set of “standards” for complexes and focal species to evaluate achievement of VPHCP objectives

- A. Annually identify threats and implement actions to prevent or reduce those threats.
- B. Prevent an average decline of at least one cover class of any focal plant species over 3 years for years having at least 55% average rainfall.
- C. Prevent a 20% decline in the density of the focal shrimp species over 3 years.
- D. At complexes with 10% or greater average total nonnative species cover, prevent an increase in one cover class for nonnative cover over 3 consecutive years, regardless of rainfall.
- E. Maintain vernal pool hydrological network (inlet and outlet features) and water storage (maximum depth within +/- 10% of baseline) functions.

# Technical White Papers 3 & 4

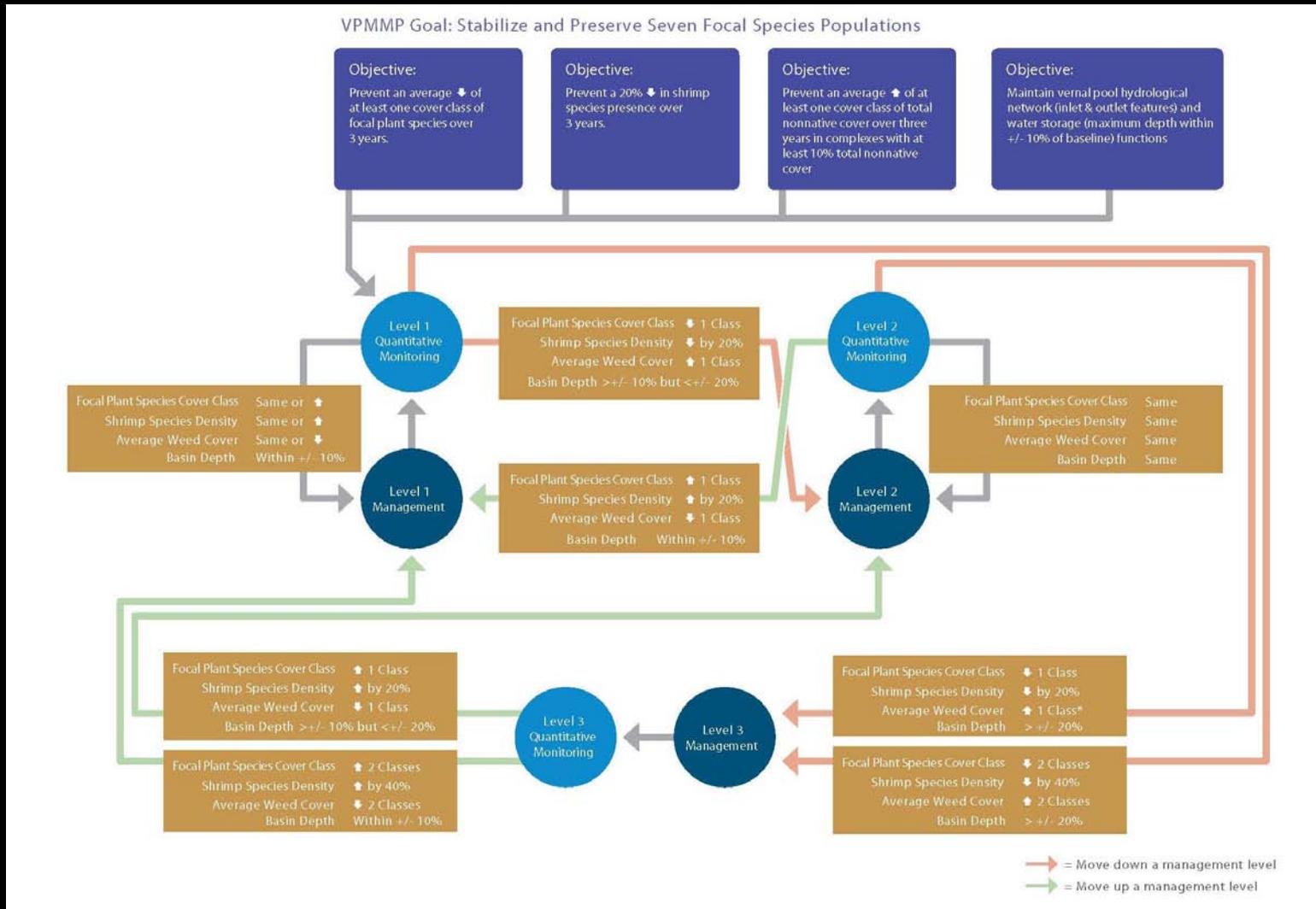
## Adaptive Management and Monitoring Strategy

### VPHCP Preserve Monitoring and Management Levels

- Level 1: Maintenance (Stewardship)
- Level 2: Stabilization
- Level 3: Remediation

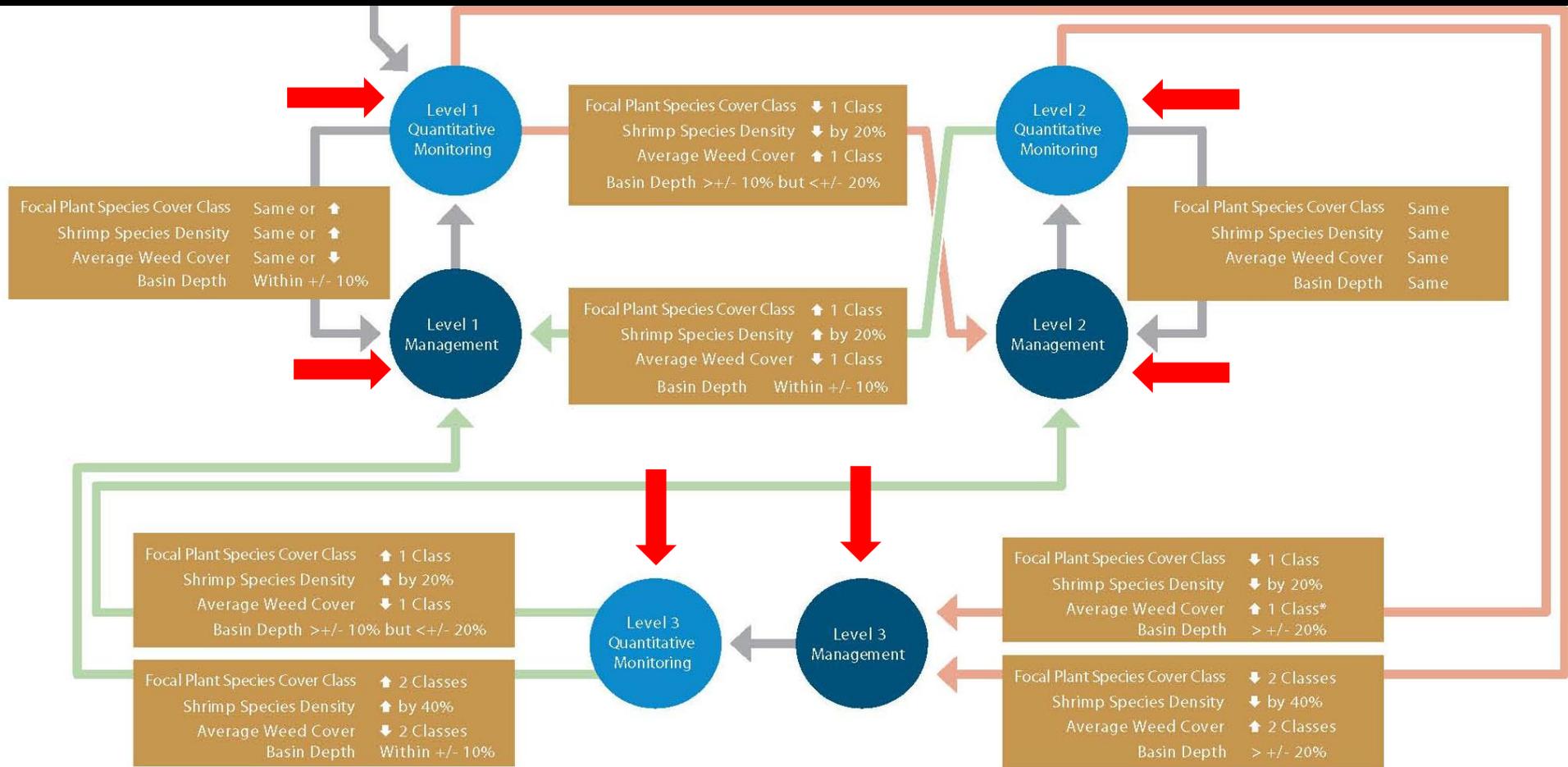
# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy



# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy



# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

### VPHCP Preserve Monitoring Program

- Evaluate VPMMP Standards and guide management
- Qualitative monitoring
  - All Levels
  - Determine overall complex health
- Quantitative monitoring
  - Monitor indicators of focal species population health
  - Based on best expert opinion and experience
  - Intensity of monitoring increases with each Level
- Key is to identify population problems early

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

**Table 2-1**  
**Tiered Monitoring Approach**

Level	Sample Size	Frequency and Timing	Monitoring Method
<b>Qualitative</b>			
	All complexes	Three visits annually during wet season	Threat assessment and pool inundation verification
<b>Quantitative</b>			
Level 1	Baseline hydrologic survey	Once	Measure maximum pool depth, pool inlet and outlet, and geomorphic setting of complex
	10% of pools in each complex with focal plant species  If complex has <10 pools for each focal species, survey at least one pool for each focal species known to occur	Annually, spring	Collection of cover class data of each focal plant species and each nonnative plant species
	Up to 10 pools or 5% of pools with focal shrimp species, whichever is greater	Every 3 years, dry season	Dry season sampling with genetic identification of cysts
Level 2	Baseline hydrologic survey	Once	Measure maximum pool depth, pool inlet and outlet, and geomorphic setting of complex
	All pools in complex with focal plant species	Annually, spring	Collection of cover class data of each focal plant species and each nonnative plant species
	Up to 10 pools or 10% of pools with focal shrimp species, whichever is greater	Every 3 years, dry season	Dry season sampling with genetic identification of cysts
Level 3	Baseline hydrologic survey	Once	Measure maximum pool depth, pool inlet and outlet, and geomorphic setting of complex
	All pools in complex with focal plant species	Annually, spring	Collection of cover class data of all native plant species and each nonnative plant species
	Up to 10 pools or 20% of pools with focal shrimp species, whichever is greater	Every 3 years, dry season	Dry season sampling with genetic identification of cysts

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

### Management Action Triggers

- Triggers for elevating or reducing Level of a complex
- Triggers based on the VPMMP Standards
- Triggers were developed based on observations and management experience over 15+ years to detect problems early
- Monitoring and management occurs over a 3-year (Level 2) or 5-year (Level 3) time period; Level 1 is ongoing

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

### Management Actions

- Access Patrol/Enforcement
- Fencing and Signage Installation and Repair
- Weed Control
- Seed Bank Reestablishment (Collection, Bulking, and Dispersal)
- Container Plant Production and Installation
- Shrimp cyst collection and redistribution
- Topographic Reconstruction
- Restoration and Management Plan

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

### Management Action Example: Weed Control

- Level 1 Weed Control
  - 2 visits per year for overall complex (spot treatment of target areas)
  - 2 visits per year to target vernal pools with focal species
- Level 2 Weed Control
  - 3 visits per year for overall complex
  - 2 visits per year to target vernal pools with focal species as well as 20-foot buffer (based on average 5:1 basin to watershed ratio)
- Level 3 Weed Control
  - 4 visits per year for overall complex
  - 4 visits per year to target vernal pools with focal species as well as 35-foot buffer (based on average 10:1 basin to watershed ratio)

# Technical White Papers 3 & 4

## Adaptive Management and Monitoring Strategy

Each complex has been tentatively assigned a Monitoring and Management Level

- Based on collaboration with AECOM, SANDAG SB, City, and WLAs
- Specific management actions have been defined for each complex based on Level as well as specific site needs
- Over 30% have been targeted for Level 2 or 3
- Intended to guide development of the City's implementing document for vernal pool management
- Still being vetted with the City and WLAs

# Technical White Paper 5

## Cost Evaluation for Implementation of Management and Monitoring

# Technical White Paper 5

## Cost Evaluation for Implementation of Management and Monitoring

- Cost estimate for implementing the VPMMP for the life of the VPHCP Permit (36 years)
- Did not use standard PAR software, which is limited and not customizable
- Developed comprehensive, detailed, transparent, step-wise approach to estimating implementation costs by complex
- Adaptive and repeatable
- Based on real world cost information, 15+ years of experience, and best expert opinion

# Technical White Paper 5

## Cost Evaluation for Implementation of Management and Monitoring

- Costs based on Monitoring and Management Level
  - Level 1: Maintenance (Stewardship)
  - Level 2: Stabilization
  - Level 3: Remediation
- Complex-by-complex evaluation to assign Level
- Considered other costs (e.g. fencing, baseline hydrological surveys)
- Estimate one-time and ongoing costs for each complex (2012 dollars, not adjusted for inflation)
- Overall cost for entire VPHCP Preserve and City cost (only City-controlled lands)

# Technical White Paper 5

## Cost Evaluation for Implementation of Management and Monitoring

Developed a methodology to estimate a cost for each complex based:

- Monitoring and Management Level
- Number of pools occupied by plant and/or shrimp focal species
- Average level of effort for complex-wide activities (e.g., fence repair, trash removal, general weed control)
- Fence/sign installation, if necessary

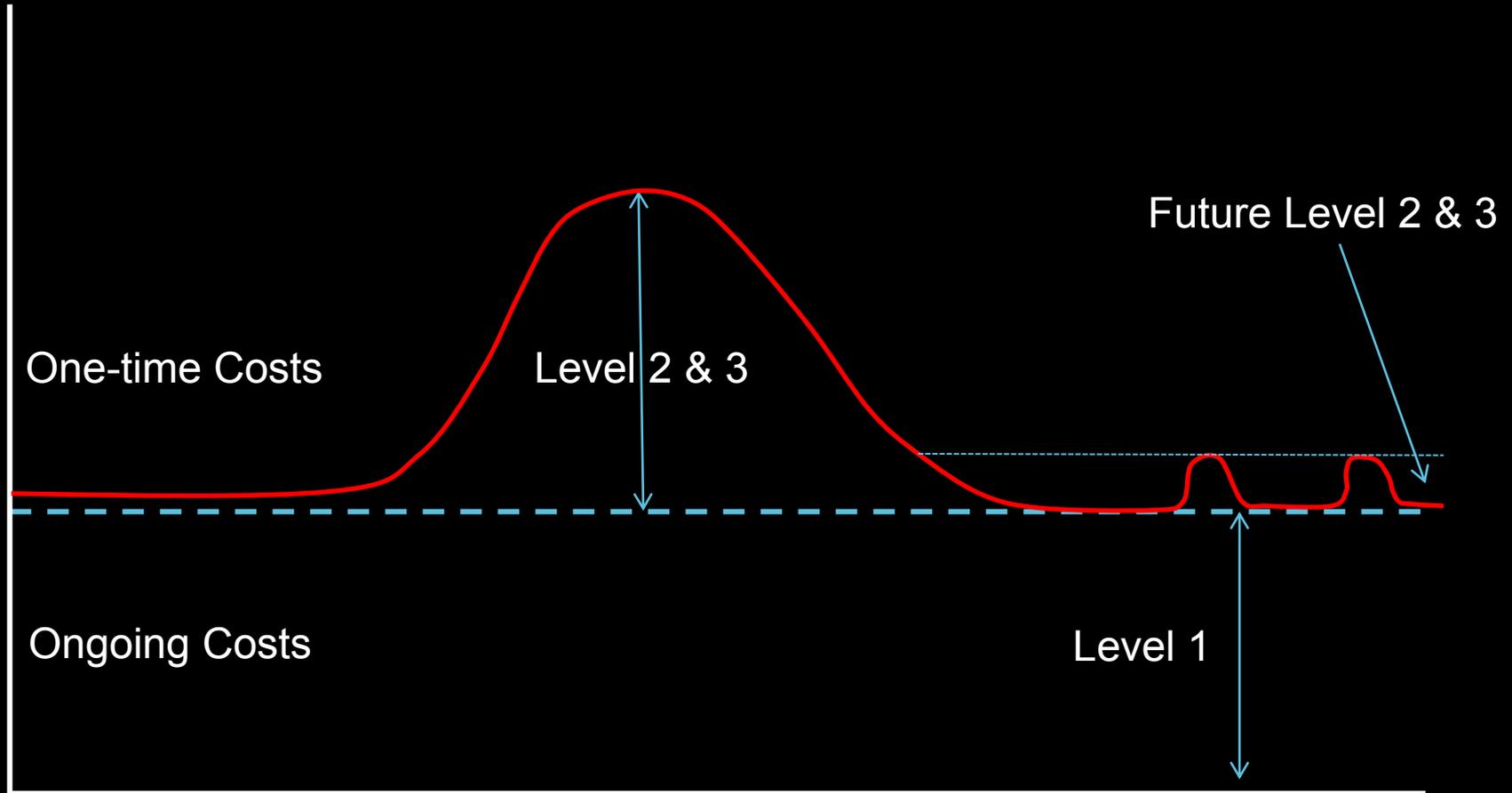
# Technical White Paper 5

## Cost Evaluation for Implementation of Management and Monitoring

- Level 1 is ongoing cost for length of the HCP Permit (36 years)
  - All complexes will eventually be managed at Level 1
- Level 2 and 3 are one-time cost
  - Level 2: assume 3 years to move to Level 1
  - Level 3: assume 5 years to move to Level 1
  - Site-Specific Management Plans are equivalent to Level 3
- Other one-time costs
  - Fencing/sign installation, if necessary
  - Baseline hydrological surveys

# Technical White Paper 5

## Cost Evaluation for Implementation of Management and Monitoring



# Technical White Paper 5

## Cost Evaluation for Implementation of Management and Monitoring

- Annual Contingency
  - Over time, some complexes will decline to Level 2 or 3
  - Conservative assumption that each year two Level 1 complexes will decline to Level 2 or one Level 1 will decline to Level 3
- Other considerations
  - Based on guidance from USFWS
  - Catastrophic fire or other widespread disturbance
  - Uncertainties related to fairy shrimp management (e.g., hybridization)

# Technical White Paper 5

## Cost Evaluation for Implementation of Management and Monitoring

Alternative	Total One-Time Cost	Annual Ongoing Cost	Total Implementation Cost (36 Years)
<b>Project</b>	\$7,048,872	\$1,012,638	\$31,584,758
<b>Alternative 1 (Baseline)</b>	\$6,146,661	\$781,444	\$27,742,700
<b>Alternative 2 (Expanded Conservation)</b>	\$7,078,473	\$1,014,977	\$31,691,168

Note: Costs are in 2012 dollars, not adjusted for inflation

# Technical White Paper 6

## Recommendations for Conditions of Coverage

# Technical White Paper 6

## Recommendations for Conditions of Coverage

- Summarizes results of conservation analysis in TWP 2
- Develops criteria for coverage based on VPHCP goals and objectives as well as best expert opinion
- Determines coverage of the focal species provided under each alternative
- Identifies special conditions for coverage

# Technical White Paper 6

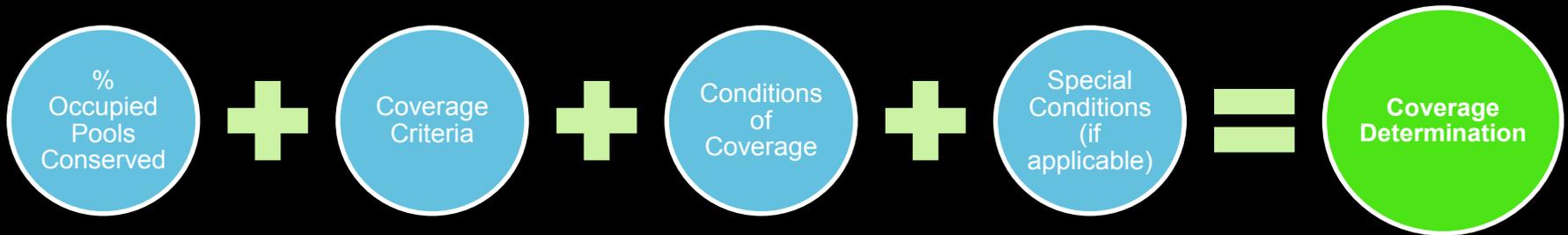
## Recommendations for Conditions of Coverage

### Criteria for coverage of VPHCP focal species:

1. All complexes occupied with the focal species are conserved at some level (75%, 94%, or 100% conservation level)
2. All complexes identified in the USFWS Recovery Plan (Appendix F) as necessary to stabilize the focal species populations are conserved at some level (75%, 94%, or 100% conservation level)
3. The focal species population genetics within any given complex are conserved (i.e., at least 50% of occupied vernal pools within a complex are conserved at some level)

# Technical White Paper 6

## Recommendations for Conditions of Coverage



# Technical White Paper 6

## Recommendations for Conditions of Coverage

### What are the Special Conditions of Coverage?

- Additional conditions for specific pools in a complex to meet Coverage Criterion # 3
- If Criteria #1 or 2 or not met, there are no special conditions
- Mitigation to preserve unique genetics within a complex series
- Onsite restoration using salvaged genetic material
- One-to-one ratio for genetic translocation
- Success criteria to verify population viability equal to or greater than salvaged population

# Technical White Paper 6

## Recommendations for Conditions of Coverage

### Example: Coverage Determination for Riverside Fairy Shrimp - Project

Species	Population Conserved within Area Subject to City's Jurisdiction	Population Lost Inside Preserve within Area Subject to City's Jurisdiction	Population Lost Outside Preserve within Area Subject to City's Jurisdiction	Total Population Lost within Area Subject to City's Jurisdiction	Coverage Criteria Met?	Species Covered by VPHCP Based on Coverage Criteria?	Conditions for Coverage or Additional Requirements for Coverage	Species Covered by VPHCP Based on Additional Conditions of Coverage?
<b>Focal Fairy Shrimp Species</b>								
Riverside fairy shrimp ( <i>Streptocephalus wootoni</i> )	99% (131 out of 132 occupied pools)	None	0.76% (1 out of 132 occupied pools)	0.76% (1 out of 132 occupied pools)	<p><b>Criterion 1: Yes</b> All complexes occupied with Riverside fairy shrimp would be conserved at some level.</p> <p><b>Criterion 2: Yes</b> All complexes identified in the USFWS Recovery Plan as necessary to stabilize Riverside fairy shrimp would be conserved at some level.</p> <p><b>Criterion 3: Yes</b> Only one pool at J 34 (Candlelight) would be lost (0% conserved). However, the other pool containing Riverside fairy shrimp at J 34 (Candlelight) would be conserved; therefore, at least 50% of the local genetics would be conserved at that complex.</p>	Yes	<p><u>Conditions of Coverage:</u></p> <ul style="list-style-type: none"> <li>Mitigation is necessary for the loss of the pool with this focal species at J 34. General mitigation conditions are detailed in Section 2.4.</li> <li>Of the currently known Riverside fairy shrimp population within the Preserve, 100% conservation must be maintained for coverage.</li> <li>The City must adopt a plan that provides directives for restoration, management, and monitoring of vernal pool complexes in the Preserve such that long-term viability of Riverside fairy shrimp is maintained in perpetuity.</li> </ul>	Yes

# Technical White Paper 6

## Recommendations for Conditions of Coverage

### Example: Coverage Determination for Riverside Fairy Shrimp - Baseline

Species	Population Conserved within Area Subject to City's Jurisdiction	Population Lost Inside Preserve within Area Subject to City's Jurisdiction	Population Lost Outside Preserve within Area Subject to City's Jurisdiction	Total Population Lost within Area Subject to City's Jurisdiction	Coverage Criteria Met?	Species Covered by VPHCP Based on Coverage Criteria?	Conditions for Coverage or Additional Requirements for Coverage	Species Covered by VPHCP Based on Additional Conditions of Coverage?
<b>Focal Fairy Shrimp Species</b>								
Riverside fairy shrimp ( <i>Streptocephalus wootoni</i> )	96% (127 out of 132 occupied pools)	None	4% (5 out of 132 occupied pools)	4% (5 out of 132 occupied pools)	<p><b>Criterion 1: Yes</b> All complexes occupied with Riverside fairy shrimp would be conserved at some level.</p> <p><b>Criterion 2: No</b> Not all complexes identified in the USFWS Recovery Plan as necessary to stabilize Riverside fairy shrimp would be conserved, including J 13 S, J 20-21, and J 21 (0% conserved).</p> <p><b>Criterion 3: No</b> Both occupied pools at J 34 (Candlelight) would be lost. Therefore, none of the local genetics would be conserved at that complex.</p>	No	It is not possible for the Preserve as designed under Alternative 1 (Baseline) to provide coverage for Riverside fairy shrimp because the boundary does not include the complexes necessary to be consistent with the USFWS Recovery Plan.	No

# Technical White Paper 6

## Recommendations for Conditions of Coverage

Alternative	Focal Species Coverage Determination						
	PONU	POAB	NAFO	ERAR	ORCA	RFS	SDFS
<b>Project</b>	Yes	Yes	Yes	Yes, with special conditions	Yes	Yes	Yes, with special conditions
<b>Alternative 1 – Baseline</b>	No	No	No	No	Yes	No	No
<b>Alternative 2 – Expanded Conservation</b>	Yes	Yes	Yes	Yes, with special conditions	Yes	Yes	Yes, with special conditions

PONU = Otoy Mesa mint  
 POAB = San Diego mesa mint  
 NAFO = Spreading navarretia  
 ERAR = San Diego button-celery

ORCA = California Orcutt grass  
 RFS = Riverside fairy shrimp  
 SDFS = San Diego fairy shrimp

# Summary

# VPHCP Technical White Papers

## Summary

- TWPs were prepared to provide SANDAG SB with the information necessary to prepare the VPHCP
- Conservation analysis is tied to VPHCP goal and objectives
- Adaptive monitoring and management strategy to meet VPHCP goal and objectives

# Next Steps

- Draft VP HCP and Draft EIR/EIS for Minimum 60 Day Public (February 2013)
- Land Use & Housing Workshop (April 2013)
- Final Draft VP HCP and Final EIR/EIS; Begin Hearing Process (July 2013)

# Contact Information

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# Questions