To: **South Bay Salt Pond Restoration Project Team**

From: **Center for Collaborative Policy**

Re: **Outcomes from the September 8, 2005 Adaptive Management Plan Work Session**

Background: The Adaptive Management Plan Work Session was held Thursday, September 8, 2005 from 1:00 am to 4:00 pm at the Mountain View Community Center. The meeting was convened to provide ongoing input by the public and others to the South Bay Salt Pond Restoration Project Management Team (PM Team), Science Team, and its technical consultants on the Draft Adaptive Management Plan.

Meeting Attendance: Attachment 1 lists meeting participants.

Meeting Materials: Those who attended the Work Session were provided with an agenda, four adaptive management scenarios, a copy of Table 4, Figure 3, proposed applied studies from pages 28 and 29, and a copy of the tidal action continuum from the Draft Adaptive Management Plan. These materials may be found on the Project web site. Attachment 2 shows the four scenarios that were used during the meeting. Attachment 3 provides the outcomes of the scenarios from the break-out sessions.

Substantive Meeting Outcomes:

1. Welcome, Introductions, and Agenda Review

Steve Ritchie, Executive Project Manager, welcomed everyone and asked both Forum members and public attendees to introduce themselves. Ritchie provided an overview of the work session's objectives, and a review of the agenda. The work session objectives were:

- Get an update on the Initial Stewardship Plan.
- Review comments and provide additional feedback on the Draft Adaptive Management Plan.
- Learn and contribute to how the Adaptive Management Plan can be used to address critical restoration management questions and/or potentially competing project objectives.

2. Initial Stewardship Plan Update

Clyde Morris, of the U.S. Fish and Wildlife Service, discussed the Refuge part of the Initial Stewardship Plan (ISP). He said Phase II of the ISP had started and stated that there are some violations of the dissolved oxygen (DO) standard. However, they are working on resolving that issue and are correcting it in Pond A14 by putting in baffles. Another effort that was tried was to shut down the system during certain times of the month lasting from several days to a week. In Pond A16, after the sixth day, the DO level did not come back up during the day, and there was a fish kill in the pond due to the fish using up the remaining oxygen. Now, in Pond A16, they have made it muted tidal habitat and the DO has gone up and stayed up. Morris said they are also preparing for the waterfowl hunting season on October 22, and that they will start with a tightly controlled pilot program.

John Krause, of the California Department of Fish and Game, discussed the ISP progress of the ponds under its management in the Eden Landing area. He said that one of those ponds is also experiencing low DO levels, and that they have changed the operation of at least one pond to muted tidal to correct that. He said that they have been doing operations maintenance for levee control on the Pond 2 system and that that one area of the levee is still soft, so they will drop the water level there in order to firm up the levee. They are also finishing a water control structure in the Pond 6A system and plan to start operating it in the fall. Other ponds are operating well and meeting the DO standards. He said that the Reserve would be having a hunting season consisting of two days each in November, December and January.

Clyde Morris added that the S*partina* control program has gotten underway and that the Refuge is beginning to remove this invasive plant.

3. Review of Comments Received on the Draft Adaptive Management Plan

Dr. Lynne Trulio, Lead Scientist for the Project, addressed the issue of how the Adaptive Management Plan will approach the Project alternatives. She said that choosing any one of the alternatives, as an endpoint is very difficult because of all the Project challenges and uncertainties. She showed a graph of a "staircase" approach looking at how the system will evolve and incrementally approach tidal restoration. She stated that the Adaptive Management Plan is designed to help us understand how to move along the tidal marsh continuum while still achieving the Project objectives.

She pointed out that in the Science Section of the Adaptive Management Plan there are three parts: the restoration targets, the monitoring, and applied studies. She said that the restoration targets and monitoring are tightly linked and highlighted Table 4 in the plan, showing the project objectives with potential restoration targets to achieve those objectives, and potential monitoring parameters to measure to see if the restoration targets are being met.

Trulio explained that the applied studies are a separate track designed to address uncertainties and test hypotheses and research questions, and that each hypothesis is linked to a management action.

In the Institutional Structure Section, she said that the structures and processes are laid out for decision-making and show how the project will complete the loop from collecting data and putting the data into the current phase of the project as well as in future phases.

During the break-out groups, she said, think about what processes will ensure timely processing and management of data, what information will be fed back into the decision-making, what triggers and decision processes will be used to implement management actions.

She said that she received comments from 18 people on the draft Adaptive Management Plan, and that comments were positive on the structure of the plan. She said that there were a lot of comments on Table 4, which she discussed previously, and said she appreciated them and pointed out that they are preliminary and need to be worked out with the public, the Science Team, and Project Management Team.

She said there were also a lot of comments on public access and wildlife protection considerations. For example, maybe we need more parameters to ensure we're protecting wildlife, and other comments were that we need to have more public access and understand when it is not affecting wildlife. There were also comments on including more information on invasive and nuisance species and connecting the project to transitional habitat that is outside of the project area. Some said the institutional structure was too complex and hard to understand how the parts fit together. In the section that discusses developing models for the project, she is working with the modelers and the Science Team to develop that section more. There were also comments about further developing the monitoring parameters.

Trulio also asked participants during the break-out sessions to include potential problems where the project might start going off track and what would we do about that. She said that the group would be looking at various scenarios for Phase I where it seems like a project objective is not being met and if so, what would we do? She said that the idea for each scenario is to consider what conditions indicate that management action is needed. What actions should the project management team take and who should be involved, and what studies and monitoring could we put in place ahead of time to help avoid the problems? Also, what other scenarios might be envisioned that would require management action and remedial measures?

She mentioned a timeline for the Adaptive Management Plan and said the comments would be addressed, as well as working with the Project Management and Science Teams, to get a second draft ready by October 28.

Q: Is there a separate deadline for the National Science Panel?

A: There will be a public version after we meet with the National Science Panel.

Q: I have a question about (inaudible) mercury information—where did that come from?

A: That was based on the mercury technical memo by Brown and Caldwell and with input from the Science Team. That is available to read.

Q: As you've been going through the development of this have you given some thought to what you might need for a baseline for monitoring? If you don't have a baseline it's very hard to detect a change and what kind of information do we need to gather to have a sufficient baseline as we move into implementation.

A: For many of the restoration targets, we need baseline information. USGS has been collecting a lot of that data, not only as part of the ISP but as part of the project monitoring, which they have been doing since 2003 and they have data before that as well. So there is a lot of information out there, but other types of baseline information will need to be collected ahead of time.

Q: I didn't submit a comment, but I would like to, are you still accepting them?

A: Yes.

Q: I was very impressed by the great amount of work that has been done on the restoration targets for the habitat area, and wondered what needs to be done for the other restoration targets like flood control and public access to add more detail and information to those sections, and how are we going to do that?

A: Yes, those areas need to be brought up to a more quantitative standard, to the extent that we can do that. So we are going to work with the consulting team and the project management team, along with the Army Corps of Engineers on the flood management part.

Q: Are we going to work in the work groups to feed information into that?

A: Mary Selkirk: I think we will get a start on that today because we have one scenarios specifically focused on is there conflict between public access and habitat improvement. We are also going to have a more structured workshop on public access a little later in October.

4. In-depth Review in Breakout Groups

The participants then divided up into three different breakout sections and went over each of the four scenarios laid out for Public Access, Flood Control, Habitat, and Public Health. (See Attachment 2 for a summary of the comments)

5. Review of Outcomes from Breakout Sessions

After the breakout sessions, the participants reconvened and Mary Selkirk, facilitator with the Center for Collaborative Policy, then led a discussion that summarized some of the comments from each breakout session.

6. What's Next

Mary Selkirk announced three upcoming tours of different areas within the Project focused on public access issues and what will be desirable goals for Phase I. The tours include:

- September 15, 2005 – tour of Island Ponds
- September 22, 2005 – tour of Eden Landing Ponds
- September 28, 2005 – tour of Alviso Ponds

Selkirk said that there will also be a Public Access Design Workshop on October 18 in the evening.

Steve Ritchie said it was important to develop a well-defined tool box of responses within the adaptive management framework of the Project, and that even carefully designed experiments could fail from which additional learning can take place and how other decisions after that will be affected.

He said that they had commissioned a study of bathymetry of the Bay earlier this year, which shows more sediment accretion between the Dumbarton and San Mateo Bridges that can't be explained at this point. However, the results will be used to go forward with the landscape assessment, which will lead developing the final alternatives, and that a future meeting on the alternatives was being planned.

7. Wrap Up and Adjourn

Steve Ritchie then concluded the meeting.

Attachment 1: September 8, 2005 Meeting Attendance

Participants	Organization/Affiliation
Nicole Athearn	USGS
Paula Bettencourt	City of Mountain View
Andree Breaux	Water Board
Ronit Bryant	League of Women Voters
Kris Buchholz	PG&E
Deborah Clark	Center for Collaborative Policy
James Counts	San Mateo Co. Mosquito Abatement District
Don Danmeier	Phil Williams and Associates
Dianne Dryer	City of Menlo Park
Beth Dyer	Santa Clara County Water District
Naomi Feger	Regional Water Quality Control Board
Arthur Feinstein	Citizens Committee to Complete the Refuge
Andrea Gant	BCDC
Susan Gearhart	League of Women Voters
Lorrie Gervin	City of Sunnyvale
Greg Green	Ducks Unlimited
Tracy Grubbs	Center for Collaborative Policy
Janet Hanson	San Francisco Bay Bird Observatory
Carin High	Citizens Committee to Complete the Refuge
Melissa Hippard	Sierra Club
Nadine Hitchcock	CA State Coastal Conservancy
Beth Huning	San Francisco Bay Joint Venture
Ellen Johnck	Bay Planning Coalition
Ralph Johnson	ACFC
Matt Kaminski	Ducks Unlimited
John Krause	California Dept. of Fish and Game
Joe LaClair	BCDC
Marilyn Latta	Save the Bay
Sheri Lubin	San Jose State University (grad student)
Libby Lucas	California Native Plant Society
Kristy McCumby	City of Sunnyvale
Austin McInerny	Center for Collaborative Policy
Eileen McLaughlin	Wildlife Stewards
Clyde Morris	U.S. Fish and Wildlife Service
Trish Mulvey	CLEAN South Bay
Sandy Olliges	NASA Ames
Chindi Peavey	San Mateo County Mosquito Abatement
Sara Polgar	BCDC
Dan Ray	DWR
Steve Ritchie	Executive Project Manager
Antoinette Romeo	Santa Clara County Parks
Steve Rottenborn	H.T. Harvey and Associates

Ana Ruiz	Mid-Peninsula Regional Open Space District
Mary Selkirk	Center for Collaborative Policy
Judy Sheen	U.S. Army Corps of Engineers
Denise Stephens	Mayne School
Dan Strickman	Santa Clara Co. Vector Control District
Kirsten Struve	City of San Jose
Lynne Trulio	San Jose State University, Lead Scientist
Susanne von Rosenberg	Gaia Consulting

Attachment 2: Adaptive Management Scenarios

Adaptive Management Scenario #1
Public Access

Overview and Project Objectives: This scenario describes a potential conflict that may arise between public access and habitat Project Objectives. Specifically, Objective #3, "Provide public access opportunities compatible with wildlife and habitat goals" and Objective #1, "Create, restore, or enhance habitats of sufficient size, function, and appropriate structure" are in conflict. Objective 1A "Assist in Rare Species Recovery: CA clapper rail" is being used for the example.

Project Objective:	Restoration Target	Currently Monitored Parameters	Potential New Monitoring Parameters
1A. Assist in Rare Species Recovery: CA clapper rail	• 1500-2500 rails in winter at a density of 0.5-1.0 birds/2.5 acres • 3 subpopulations of 500+ birds in winter • targets now being developed by FWS	• number of rails in winter • acres of tidal marsh • channel density/extent • acres of transitional upland • density of vegetation, esp. cordgrass and *Grindelia*	• chicks fledged/nest • soil texture, organic material & nutrient levels • levels of Hg in rail prey • predation rates
3. Provide public access opportunities compatible with wildlife	• public is satisfied with access opportunities provided • bird use and fish abundance not significantly affected by public access		• attitudes of public and recreationists toward the Project • bird abundance and diversity before and after public access • recreational and commercial fishing effort

Possible Situation: Public access trails are constructed along the tops of levees extending out into the South Bay. Recreationists begin using the trails in large numbers and Clapper Rails begin nesting and foraging in areas that previously had not been accessible to the public. What is the impact, if any, of trails on the Clapper Rails, or of the Clapper Rails on the users of the trails?

Recommended Applied Studies: What applied studies should be done to better understand the potential effect of increased public access on the Clapper Rail populations?

Recommended Adaptive Management Actions: Assuming there is a negative impact on Clapper Rails from increased public access, what actions might the Adaptive Management Team consider to protect the Clapper Rail populations? Additional questions to consider include:

1. How quickly does the Project Management Team (PM Team) need to respond?
2. How long should we wait for response time to any physical/management changes?
3. What is the Management Trigger?
4. What situation would trigger management intervention?
5. What is the required regulatory response?

Decision-making: What should be the decision-making process for taking action? How should the PM Team, the Science Team, and the public be involved? How should the public be informed, and in what timeframe?

Adaptive Management Scenario #2
Flood Control

Overview and Project Objectives: This scenario presents a possible situation in which assumptions about the positive effects of opening certain ponds to tidal action turn out to be overly optimistic. Specifically, in this case, the project objective to improve flood protection may not be achieved within a reasonable time frame in the first decade of the restoration.

Project Objective	Restoration Target	Currently Monitored Parameters
2. Maintain or improve existing flood protection level	* meet requirements of flood protection agencies	• elevations and topography of levees • freeboard amount during extreme events • sea level rise data • ground surface rebound

Possible Situation: Overall flood control plan includes assumptions about channel scouring and the effects of returning certain ponds to tidal action, thereby enhancing the downstream flood capacity at the mouths of major creeks in the project area. After 10 years of restoration, anticipated scouring has not taken place in certain creeks; thus, anticipated improvements of fluvial and tidal flooding management have not developed.

Recommended Applied Studies: What kinds of applied studies should the project develop to address this possibility?

Recommended Adaptive Management Actions: How should the project adjust its flood protection measures to deal with the unanticipated reduced channel scouring? Additional questions to consider include:

1. How quickly does the Project Management Team (PM Team) need to respond?
2. How long should we wait for response time to any physical/management changes?
3. What is the Management Trigger?
4. What situation would trigger management intervention?
5. What is the required regulatory response, if any?

Decision-making: What should be the decision-making process for taking action? How should the PM Team, the Science Team, and the public be involved? How should the public be informed, and in what timeframe?

Adaptive Management Scenario #3
Habitat

Overview and Project Objectives: In this scenario, potential conflicts appear to be arising between project objectives for maintenance or improvement of different types of bird species in the project area.

Project Objective	Restoration Target	Currently Monitored Parameters	Potential New Parameters
1C. Increase diversity and abundance of native species: breeding birds	* meet or exceed pre-ISP breeding bird numbers as determined by USGS, FWS and DFG monitoring	• # of pairs of breeding birds by species •	• chicks fledged/nest • predation rates
1B. Maintain existing migratory birds: shorebirds	pre-ISP shorebird numbers and diversity available from USGS baseline data and PRBO Pacific flyway study more data are needed to characterize natural variability	• number of species and abundance of each • acres of tidal flat foraging habitat in tidal marshes, ponds, sloughs and Bay • acres of low and medium salinity ponds	• fecal coliform levels in heavily used ponds • for indicator species, percent of flyway population visiting South Bay • invertebrate density • Hg levels in invertebrates

Possible Situation: In this scenario, actions to increase diversity of some native species may appear to be in conflict with maintaining migratory waterfowl populations, thereby putting two objectives of the project in conflict. Ten years after initiation of Phase 1 of the project, migratory shorebird numbers have dropped by 15% in the Project area. It is not clear whether this is due to decreased acreage of managed ponds in the project area, natural variability, or loss of habitat in the Arctic.

Recommended Applied Studies: What additional applied studies should the project initiate to study the trends in this potential conflict, or to determine if there is in fact a conflict between the objectives?

Recommended Adaptive Management Actions: What actions should the project take if these objectives turn out to be in conflict? Additional questions to consider include:

1. How quickly does the Project Management Team (PM Team) need to respond?
2. How long should we wait for response time to any physical/management changes?
3. What is the Management Trigger?
4. What situation would trigger management intervention?
5. What is the required regulatory response, if any?

Decision-making: What should be the decision-making process for taking action? How should the PM Team, the Science Team, and the public be involved? How should the public be informed, and in what timeframe?

Adaptive Management Scenario #4
Public Health

Overview and Project Objectives: In this scenario, public health issues arise when residents become concerned that local mosquito populations seem to be increasing, which they worry could result in the spread of West Nile Virus.

Project Objective	Restoration Target	Potential Monitoring Parameters
5. Maintain or improve current levels of nuisance and invasive species: mosquitoes	* mosquito numbers do not increase above pre-ISP/ISP levels * numbers available from the Santa Clara and Alameda county mosquito abatement districts	• Methods and parameters as per the mosquito abatement districts

Possible Situation: In part of the Project area, after a number of ponds are returned to full tidal action, several local residents begin to complain that mosquito numbers have

increased. They believe this is due to the Restoration Project and that the Project is adding to a public health hazard.

Recommended Applied Studies: What kinds of applied studies should the project develop to address this possibility?

Recommended Adaptive Management Actions: What actions should the project take if this situation arises? Additional questions to consider include:

1. How quickly does the Project Management Team (PM Team) need to respond?
2. How long should we wait for response time to any physical/management changes?
3. What is the Management Trigger?
4. What situation would trigger management intervention?
5. What is the required regulatory response, if any?

Decision-making: What should be the decision-making process for taking action? How should the PM Team, the Science Team, and the public be involved? How should the public be informed, and in what timeframe?

Attachment 3: Adaptive Management Scenarios Break-out Sessions Summary

Three questions to consider under each scenario:
What kind of Applied Studies should be conducted?
What management actions should be taken?
Who are the decision-makers and decision-making process?

Scenario 1: Public Access

General questions/comments:
What is the baseline situation from which we will measure against?
It appears that habitat objectives have a higher priority, why is this?
What are the public access objectives?
A big challenge is between needing to provide access now and determining what baseline is.
Consider saying baseline for rails is zero.
Need a definition of impact, level of variability.
What is the type of trail use?
What is the enforceability?
How will the Project Management Team decide where to spend limited monitoring monies?
How will monitoring be funded?

Applied studies:
Look at Whipple Ave. site for example of public access impact on wildlife.
Try to identify the numbers of people expected at sites.
Possibly identify certain areas for no public access.
How do we better understand clapper rail population in entire San Francisco Bay in order to decide how to act at any one pond in the South Bay?
Need for better population studies and population (rail) enhancing actions.
Would continuous trails allow users to enjoy views without staying at any one location too long and thus possibly cause rail impacts?
Need to decide where critical habitats will be and then decide what types and levels of access is appropriate.
Where are rails nesting? And why?
Where are the predators?
What is the impact of trail users?
Understanding population and distribution is important (spring call counts, gross trends.
Understand how they are doing in good habitat.
Periodic evaluation state-wide, dispersal.
What kind of habitat is successful for fledging?
How far from the trails is secure?
Will new trails provide access by predators? (access along infrastructure areas?)
Need more surveys and monitoring (entire Bay and selected reference sites)
What is the impact of the hunting season?

What is the impact on rails of existing trails on the refuge? Quantify impacts
Trail elevations
Existence of buffers
Put a new trail into species habitat and establish baseline impacts; consider plant/foraging habitat.
Acknowledge existing studies on human disturbance.
Trigger: predator use of trails.
Study of positive (e.g., breeding success) in areas of human use.
Study types of public use: hiking, birding, boating, etc.

Management actions:
Need for enforcement on dogs in "prime" habitat areas.
Consider seasonal closures for certain areas.
We need to try our best to not allow conflict between public access and habitat to occur.
Response time to changes is dependent on frequency of monitoring—need to be clear on what elements are being monitored and when.
Possibly close public access in certain areas.
Consider seasonal closures.
Change rail target (set by Fish and Wildlife Service).
Agree on acceptable levels of disturbance (incidental take and Section 7).

Decision-makers:
E.S, Unit/U.S. Fish and Wildlife Service

Scenario 2: Flood Control

General questions/comments:
Can't rely only on non-structural fixes.
How will U.S. Army Corps' Shoreline Study inform flood control design?
What are we relying on to make decisions on flood control structures?
Why 10 years? What will be happening during years 1-9? Need for more frequent monitoring at key times and events.
Need for clarity and description of what Corp's Shoreline Study will do.
We are not just restoring tidal action.
It's a combination of conveyance of channels and ponds as flood storage.

Applied studies:
Would dredging help initiate tidal movement in and out of areas?
What is the impact of El Nino?
Need to better understand sediment drivers in order to plan appropriately.
Use Alameda Creek studies to better understand changes to channel as a result of Eden Landing opening to tidal flow.
Understand flood capacity.
Impacts of mercury and dredging with other environmental concerns.
Look at overall budget and storage.

Integrate with adjacent habitats (change of hydraulic demands).
Do adjoining marshlands scour sloughs?
How well are flood predictions working?
Are rise in sediment levels factored in?
Take sediment and use as base fill.
Track scour on a yearly basis.

Management decisions:
Timeframe?
For existing channel, previously deeper, how long is response time?
Depends on type of event (channel flooding by tides, etc.)
Accommodate changes for specific areas.
Create a more flexible weir capacity.
Some specified by Corps in its Operations and Maintenance Manual.
Need for Project Management Team's response quickly if flooding in Alviso.
For each action, we need a timeline, measurement variables, and set of actions.
Provide examples of possible Phase I flood control actions

1. Eden Landing
2. Alviso, Pond A8, need for mercury studies

Decision-makers:
Federal approval
Local flood districts
Flood Control Districts and Army Corps of Engineers come up with immediate protective actions.
It's dependent on who owns the land.

Scenario 3: Habitat

General questions/comments:
What if political changes alter priorities (e.g. elimination of refuges)
How will predatory species be monitored and what actions will be taken if predation increases?
Need for frequent monitoring in order to understand trends.
How frequently will monitoring occur?
Why is there a 15% decline threshold? What is rationale for setting this number?
Monitor invertebrate density and compare to later time to see if prey base changes, how can we mimic in other ponds?
It's difficult to determine whether to measure local or larger area.
Be careful what is committed to, some things take a longer time-frame to study.
Value of monitoring? Costs lots of money.
Be careful what restoration targets are and what can be managed.

Applied studies:
Canada geese have become a nuisance in Alviso. How do we define when a species becomes a nuisance?
Need to better understand trends in order to set targets and thresholds at which action is taken.
Why and how will the Project respond to actions beyond our South Bay environment (e.g. Delta levee failure, ocean changes, global warming, etc.)?
How is overall marsh restoration doing?
Use PRBO and USGS studies.
Scale is important—expand to entire South Bay and flyway.
Depends on baseline data and natural variability estimates.
Are there studies in the Arctic?
Is it a trend or not?
Track with restored tidal marsh?
Might be outside the system.
Index of habitat quality.
Longer-term studies in specific areas.
Shorebird annual monitoring in Bay, along with shorebird density on mudflat habitat.
Look at other local pond restorations.
Study gypsum layers.
How is the invertebrate community changing in the ponds—monitoring mudflats, water depth?
Appraisal of the watershed as a whole.
Landscape assessment from aerial photography—measure the overall acreage of edge.
Impact of global warming on marsh
Expand our understanding of global warming impacts elsewhere and make connections here.
Understand how different species are using each habitat type.
Establish baselines on foraging.
Understand pattern of waterfowl populations (seasonal and cyclical over years).
Regional monitoring of species around the whole Bay.
This will be necessary as part of South Bay Shoreline Study (U.S. Army Corps of Engineers).

Management decisions:
Need to identify possible responsible actions for inclusion in permits.
What about regional HCP approach? The area is big enough.
Roles of maintenance and control in ponds needs to be clarified and described.
How will priorities be set as to which species are planned for? It appears to present conflict between shorebirds and migratory waterfowl.
Adjust fish barriers on streams.
Consideration of other trade-offs.
Changing restoration targets along the way.
Trigger: some significant decline in species.
Stop more breaches.
Create more habitat for species that are declining.

Change pond habitat.
Response time should be species-specific/context-specific.
Trigger: species decline throughout the flyway.
Acquire additional acreage in the refuge boundary.
Create toolbox upfront (what actions can be taken?).
Use a cost-filter to narrow down tools.
Develop worst-case scenario for adaptive management (no funding).

Decision-makers:
Science Team/Stakeholders necessary for funding, also.
Project Management Team
Add specific science expertise
Include regulators to broaden our ability to respond.

Scenario 4: Public Health

General questions/comments:
Can project put aside money to help pay for mosquito abatement?
Infestation would be noticed right away.
Perception vs data collection.
Build in good public support of Project.
Districts need access to these areas.
Long-term physical site solutions.
Money available for response—who pays?

Applied studies:
See mosquitoes in restoration sites or in traps.
Data collected regularly to determine where they are coming from.
See if tidal flow alleviates problem.
Inspect regularly in different places.
External studies.
Water flow monitoring.
Baseline population census (any species of mosquito).
Effect of abatement (spraying) on local wildlife populations.

Management actions:
Triggers – it takes approximately 5 years for ponds to become possible mosquito breeding areas.
- Need to act quickly as mosquitoes' life span/evolution is fast.
- Need to control at night, monitor along creeks.
- Large fly-offs that inundate area.
- Trends in requests.

Very costly to control mosquitoes. Use hover craft and helicopters to access breeding sites.
Spray immediately.

Start education programs.
Districts should communicate regularly.
Management of public expectations.
Quick response; very costly—seasonally, annually, etc. by districts.
Have plans in place for response.
Establish methods of control.
Coordinate with Vector Control and Project Management Team research and actions.
Triggers:
- How much money vector control is spending.
- Clear communication plan with vector control districts.
- Plan with clear contingency constraints.
- Tools that are used to created a die-off of species.
- Public outcry.
- Reports of West Nile virus.
- (different response if non-lethal species).

Build structure that allows for rapid response (BCDC, other regulators)
Land management and vector control—do an MOU?
Stakeholder advising ongoing—via annual report?

Decision-makers:
Project Management Team promises public to take care of if there's a problem.
Direct county government involvement
BCDC, other regulators
Vector Control

Additional Comments/Scenarios
What is an acceptable failure rate for each objective and target?
Fish and other aquatic species need to be considered and evaluated as part of the adaptive management plan.
How can outreach to the public be undertaken differently as the Project progresses?