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Salton Sea Progress Report on Habitat Project Implementation

September 28, 2018

Executive Summary

People and wildlife are at risk as the Salton Sea, California's largest inland lake, continues to shrink due to rapidly declining inflows.[1] The State of California has instituted the Salton Sea Management Program (SSMP), [2] which is intended to meet the State's obligation of long-term management of the Salton Sea. Unfortunately, despite more than fifteen years of study and planning at the Salton Sea, the State has yet to complete a habitat project on exposed shoreline to address the crisis.[3]

The stakes for failure at the Salton Sea are very high. More than 650,000 people live in the immediate area and will suffer adverse health impacts due to additional dust pollution arising from the unmanaged exposed playa. More than 400 species of birds use the Salton Sea and several species are rapidly declining at the sea. Overall, failure to act at the Salton Sea will result in billions of dollars of economic loss due to impacts to public health, the environment, and local economies.

This report aggregates available information from published reports, news media, meeting presentations, public statements and interviews with stakeholders to provide a snapshot on the state of the Salton Sea and implementation of habitat projects. Based on this information, this report provides the following conclusions and recommendations:

1. The SSMP will not meet its project goals for 2018 or 2019, does not have a credible timeline for completion of current projects, and lacks a pipeline of projects to meet future goals.

2. Rapid and substantial reform of the SSMP must include additional staffing both in Sacramento and in the Salton Sea region, strong leadership and definition of programmatic roles, clear authorities, procedures to hasten project implementation, and accountability to make meaningfully progress toward completing 29,800 acres of projects in the next decade.

3. The SSMP must include planning, budgeting, and action for the long-term management of the Salton Sea.

4. To succeed, the SSMP must include meaningful participation from local community members, cities, counties, water districts, and state and federal agencies.

Continuing delays as conditions at the sea deteriorate have eroded confidence in the State's ability to meet its commitments. Community members, elected officials, and other stakeholders are demanding immediate reforms and concrete actions. On-the-ground solutions like wetland habitat and dust suppression projects are entirely achievable within the available funding, technology, and expertise already available today. By prioritizing success at the Salton Sea, investing in a high-functioning management program, and convening a collaborative leadership effort with local communities, the State of California can deliver on its promises to protect people and wildlife at the Salton Sea.

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[1] The Salton Sea's decline is the result, in part, of implementation of the 2003 Quantification Settlement Agreement (QSA), which controls the transfer of approximately 400,000 acre-feet of Colorado River Water from the Imperial Irrigation District to Southern California urban water users. For a thorough introduction to the Salton Sea and the impact to local communities from its decline, see James, I., and S. Roth. 2017. *The dying Salton Sea*. The Desert Sun. June 10, 2017, *available* at https://www.desertsun.com/pages/interactives/salton-sea/the-dying-salton-sea/

[2] The SSMP is led by the California Natural Resources Agency and is intended to fulfill the State's obligation to protect public health and to the "restoration of the Salton Sea ecosystem and the permanent protection of the wildlife dependent on the ecosystem" as required by the Salton Sea Restoration Act, California Fish & Game Code §2931(a). *See also* http://resources.ca.gov/salton-sea/

[3] While this report does not address the complicated problem of measuring dust emissions from the exposed playa or implementing emissive dust control measures at the Salton Sea, dust suppression project implementation has been hindered by many of the same obstacles as habitat projects. Ultimately, the State is responsible for implementing over 14,900 acres of dust suppression projects on the playa through 2028 and has an obligation to protect the public health of nearby residents that are further threatened by the shrinking of the Salton Sea.

INTRODUCTION

Failure to address the decline at the Salton Sea creates substantial health hazards for local communities, threatens habitat relied upon by hundreds of species of migratory and resident birds, and undermines political and economic stability in the Salton Sea region.[4] It will also potentially exacerbate challenges in water supply reliability in the Colorado River system and for Southern California.[5] Specifically:

- **Public health is threatened.** As of 2016, communities in Imperial County adjacent to the Salton Sea already endured significant health challenges, with one in five children suffering asthma and with emergency room visit rates for children ages 5 to 17 are over twice the statewide average.[6] Failure to implement dust suppression projects on the exposed playa will result in increased emissivity and worsened air quality in the region, with direct adverse health impacts for residents in Imperial and Riverside Counties and Mexicali, Mexico.[7]

- **Habitat and migratory birds will decline.** Hundreds of species of migratory birds on the Pacific Flyway rely on the Salton Sea. During California's rapid development in the 20th century, the state lost 95% of its wetlands and inland lakes,[8] and the Salton Sea provided essential habitat for migratory birds during this period. The diversity and number of birds that are using the Salton Sea is already declining as the sea shrinks and becomes more saline, with the notable decline in the number of fish-eating birds using the area for breeding or overwintering[9,10, 11] Failure at the Salton Sea means bird populations will continue to suffer declines and be less resilient to the local and regional challenges of climate change, drought, and habitat loss.

- **Local economies will suffer significant impacts.** Failure to act will result in billions in economic damage to the region, the State of California, and potentially other regions served by the Colorado River. Cohen (2014) estimated costs with inaction at the Salton Sea to range from approximately $30 to 70 billion dollars.[12] Cohen (2014) did not assess the additional cost of inaction to economies that depend on the Colorado River, which could be disrupted if impacts at the Salton Sea are left unaddressed.[13]

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[4] Cohen, Michael (2014) *Hazard's Toll: The Cost of Inaction at the Salton Sea*. The Pacific Institute, at vi-vii, *available at* http://pacinst.org/wp-content/uploads/2014/09/PacInst_HazardsToll.pdf

[5] *See* Weiser, Matt (2017) *How the Colorado River's Future Depends on California's Salton Sea*. Water Deeply (May 16, 2017), available at https://www.kqed.org/science/1642514/salton-sea

[6] James and Roth (2017) (citing the California Environmental Health Tracker Program (CEHTP), available at http://www.cehtp.org/page/asthma/query)

[7] Taylor, Mac. 2018. *The Salton Sea: A Status Update*. California Legislative Analyst's Office. (August 29, 2018), at 13-15. *Available at* https://lao.ca.gov/reports/2018/3879/salton-sea-082918.pdf ("LAO 2018")

[8] *See*, *e.g.*, Frayer, M., D. Peters, H.R. Pyrell. 1989. *Wetlands of the California Central Valley: Status and Trends 1939 to mid 1980s*. US Fish & Wildlife Service (June 1989), at 4-5, available at https://www.fws.gov/wetlands/Documents/Wetlands-of-the-California-Central-Valley-Status-and-Trends-1939-to-mid-1980s.pdf

[9] Cohen (2014), at 18-19.

[10] California Dept. of Fish & Wildlife and the U.S. Fish and Wildlife Service. 2018. Salton Sea Fisheries Long-term Monitoring, Sampling Report: Summer 2017. Available at http://resources.ca.gov/wp-content/uploads/2018/01/Salton-Sea-Fisheries-Long-Term-Monitoring-Sampling-report-Summer-2017.pdf

[11] Audubon California, unpublished data.

[12] Cohen (2014), at vii. The report's author acknowledges several uncertainties and assumptions in the cost estimates and strongly encourages additional research specific to the Salton Sea region. The report estimated that emissive dust alone would cost $3.5 to $37 billion through 2047, lost property values near the Salton Sea could be from $400 million to $ 7 billion (if noxious odors and other impacts are considered on the region's lucrative golf course and resort attractions), lost recreation-related revenue was estimated at $110-150 million through 2047, and damage to "non-use" (i.e., habitat provided by wetlands) value for the sea values of wildlife habitat and other non-consumptive uses) is approximately $1.6-2.2 billion annually, which will decline as the sea shrinks and becomes less hospitable.

[13] Weiser (2017)

- **Regional political stability and opportunities for collaborative solutions will decline.** If the efforts to stabilize conditions at the Salton Sea fail, stakeholders will be forced to use more confrontational means to protect their interests. A decrease in collaboration and an increase in litigation are reasonably expected outcomes.[14] A less collaborative approach will ultimately result in additional ill will, delays, expense, and lost opportunity costs. Meanwhile, people and wildlife will continue to suffer.

The California Natural Resources Agency (CNRA) leads the SSMP and released a draft SSMP Phase I: 10-year Plan ("10-year Plan") in March 2017.[15] The 10-year Plan,[16] a subsequent draft work plan,[17] and the State Water Resources Control Board's Order 2017-0134 commit the State to build 29,800 acres of habitat and dust suppression projects on exposed playa at the Salton Sea through 2028, with at least 50% of the acreage to provide habitat values.[18] However, project implementation suffers from ongoing delays arising from technical, legal, staffing, and financial challenges.

This report provides a status update about the physical and ecological state of the Salton Sea and the status of habitat projects that are being implemented at the sea, including those that are part of the State of California's Salton Sea Management Program (SSMP). It also provides a summary of known problems hindering progress at the Salton Sea and offers recommendations for changes to the SSMP to improve progress.

The information in this report was aggregated from a variety of written resources and interviews with stakeholders working on habitat project implementation. This report complements the California Legislative Analyst's Office report, *The Salton Sea: A Status Update* (August 2018), which provides a thorough introduction to the Salton Sea, the 2003 Quantification Settlement (QSA), relevant legislation, and the State's role in addressing the crisis at the sea.[19] It is also informed by several existing studies and reports, including the Pacific Institute's 2014 report *Hazard's Toll: The Cost of Inaction at the Salton Sea*.[20]

PHYSICAL STATE OF THE SALTON SEA IN SEPTEMBER 2018

The physical condition of the Salton Sea is rapidly changing and will continue to shift over the next decade because mitigation water sent to the Salton Sea as part of the QSA ceased in 2017 and water transfers to other QSA parties are increasing.[21] The Salton Sea will shrink, become more saline, leaving more playa exposed, and increasing dust emissions.

Elevation. As of September 26, 2018, the elevation of the surface of the Salton Sea was 237 feet below sea level (NAVD 1929).[22] California Department of Water Resources (DWR) projects that the elevation will fall to approximately 248 feet below sea level by July 2028 and to approximately 250 feet below sea level by early 2030's,[23] meaning a drop of more than 20 feet since 2003.[24]

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[14] *See* Bradshaw. K. 2017. *Stakeholder Collaborations for Managing Land and Natural Resources*. Administrative conference of the United States (Sept. 18, 2017), at 35, available at https://www.acus.gov/sites/default/files/documents/Natural%20Resource%20Collaborations%20Report.pdf
[15] *Available* at http://resources.ca.gov/salton-sea/
[16] *Available* at http://resources.ca.gov/docs/salton_sea/ssmp-10-year-plan/SSMP-Phase-I-10-YR-Plan-with-appendices.pdf
[17] http://resources.ca.gov/wp-content/uploads/2018/01/SSMP-Phase-I-Work-Plan-Final-20181.pdf
[18] https://www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/2017/wro2017_0134_with_exhibit_a.pdf
[19] LAO (2018)
[20] Cohen (2014)
[21] For a thorough discussion and projections of playa exposure, *see* Cohen (2014), at 7-11
[22] Source: http://pacinst.org/current-information-salton-sea/
[23] DWR presentation, Salton Sea Management Program meeting (Feb. 7, 2018) (DWR 2018)
[24] These estimates do not anticipate additional water transfers or water conservation efforts that may further reduce flows to the Salton Sea.

Salinity. Salinity at the Salton Sea currently averages 60 to 70 parts per thousand (ppt). Salinity exceeded 60 ppt in 2016, which is the level at which some biologists projected would be too high for successful tilapia reproduction, the main food resource for fish-eating birds. In 2017, biologists report that the Salton Sea tilapia population is "much smaller" than prior observations, but that some reproduction appears to continue. [25] DWR projects that the Salton Sea salinity will continue to rise as the lake shrinks to more than 150 ppt by 2045.[26, 27]

Table 1. Additional exposed playa and proposed construction of dust and habitat projects by year. (CNRA 2017)

YEAR	EXPOSED ACRES	PROPOSED CONSTRUCTION
2018	3,500	500
2019	4,200	1,300
2020	5,000	1,700
2021	5,600	3,500
2022	5,500	1,750
2023	5,300	2,750
2024	4,900	2,700
2025	4,300	3,400
2026	3,900	4,000
2027	3,300	4,000
2028	2,800	4,200
TOTAL	**48,300**	**29,800**

Exposed playa. Actual playa exposure increased from 862 acres in 2003 to 16,452 acres in 2016.[28] In 2017, playa exposure was calculated at 18,600 acres. Approximately 67,000 acres are estimated by 2028.

Dust emissions. A recent report to the Imperial Irrigation District estimates dust emissions from the exposed playa are 48.9 to 738.4 tons per year.[29] The State is obligated to control dust emissions from the exposed playa. Additional study is needed to understand the characteristics and emissivity of different parts of the exposed playa and how playa dust contributes to the overall threats to public health posed by poor air quality challenges in the region.[30]

THE SSMP WILL NOT MEET ITS GOALS IN 2018 OR 2018 AND REQUIRES REFORM TO MEET FUTURE GOALS

Fifteen years after the execution of the QSA, the State of California has yet to complete construction of a habitat project as part of the Salton Sea Management Program. When this report was initiated, it was expected that projects could be described with specific budgets and timelines for completion. Unfortunately, projects timelines and budgets remain uncertain because they have been delayed due to staffing limitations, insufficient prioritization by the State, technical challenges in designing feasible projects on the exposed playa, lack of adequate funding and financial systems, and lingering unresolved issues related to easements and leases on lands affected by SSMP projects. Even projects that predate the SSMP Phase I: 10-year Plan and do not count toward the 10-year goals, such as Red Hill Bay and the Species Conservation Habitat, continue to suffer delays.[31] Appendix A to this report

[25] California Dept. of Fish & Wildlife and the U.S. Fish and Wildlife Service. 2018. Salton Sea Fisheries Long-term Monitoring, Sampling Report: Summer 2017, at 7, *available at* http://resources.ca.gov/wp-content/uploads/2018/01/Salton-Sea-Fisheries-Long-Term-Monitoring-Sampling-report-Summer-2017.pdf
[26] DWR (2018)
[27] As the sea changes and becomes more saline, it will support salt-tolerant invertebrates such as brine flies and potentially brine shrimp. Birds preying on those resources will abide at the Salton Sea, but bird species that rely on fish for survival will have to forage elsewhere. At some point, if the sea becomes too saline, it will become inhospitable to wildlife as it will no longer support saline-tolerant invertebrates. Cohen, M. and K. Hyun. (2006). *Hazard: The Future of the Salton Sea with No Restoration Project*. Pacific Institute, available http://pacinst.org/reports/saltonsea/report_lowres.pdf (Cohen 2006)
[28] Formation Environmental, LLC, Air Science, Inc., and PlanTierra LLC. 2018. *Salton Sea Air Quality Mitigation Program: 2016/2017 Annual Report and Emissions Estimates*, at 1, *available at* https://www.iid.com/home/showdocument?id=17055
[29] Formation Environmental (2018), at 3
[30] *Id*.
[31] Sahagun, L. 2018. *As salinity grows and toxic dust spreads, patience wears thin at the Salton Sea*. Los Angeles Times (May 17, 2018), available at http://www.latimes.com/local/california/la-me-salton-sea-20180517-story.html

provides a table summarizing the status, budget, complicating factors, and lessons learned for the known habitat projects at the Salton Sea.

A review of available information led the following five conclusions:

1. The State will not meet project goals for 2018 or 2019. The State of California will fail to meet the first year's goal to complete 500 acres of habitat and dust suppression projects by the end of 2018 as set by the SSMP Phase I: 10-year Plan and the State Water Resources Control Board's WRO 2017-0134.[32]

2. The State does not have a pipeline of projects to meet future goals. There is no clear pipeline for project rollouts over the next several years.[33,34] Stakeholders interviewed for this report indicate that they were less concerned about the State's failure to achieve its goals in 2018 than they were that ongoing obstacles – such as property right disputes and the State's limitations on contracting for projects - threaten progress and may indefinitely delay project implementation.

3. The SSMP lacks adequate staff to meet program goals. Staff resources remain limited at the California Natural Resources Agency, the Department of Water Resources, and the Department of Fish and Wildlife. Stakeholders interviewed for this report stated that existing staff are often stretched too thin, have competing responsibilities or tasks, or are not engaged while awaiting progress on aspects of the projects beyond their control (e.g., design engineers are not engaged because unresolved legal issues delay projects for months). Staff turnover also contributes to inconsistency and knowledge gaps in project development and implementation. Likewise, stakeholders said that staff at local counties and water agencies are often trying to accommodate the demands of the SSMP on top of existing responsibilities that compete for time and resources.

4. A lack of inter-agency coordination is hindering progress. While inter-agency coordination has improved in recent years, there remain disconnects and delays between and within local, state, and federal agencies. State officials and IID continue to struggle to resolve property rights issues. State officials also report conflicts with federal agencies over permitting and approvals to move projects forward. Existing memoranda of understanding between the State of California and the U.S. Department of the Interior were anticipated to catalyze greater cooperation and investment in the SSMP, but they have languished with the change in federal administration in 2016.

5. Funding is available, but money is not flowing to projects. The SSMP is well-funded with more than $730 million from local, state, and federal funds committed to the sea and the potential for another $200 million from Proposition 3 on the November 2018 ballot. [35,36] The State of California estimates that it needs approximately $412 million to implement the 10-year plan, but that number does not include ongoing operations and maintenance costs.[37, 38] Despite the considerable bond funding, projects such

[32] Salton Sea Management Program stakeholders meeting, June 12, 2018.
[33] *See* http://resources.ca.gov/wp-content/uploads/2018/04/SSMP-Summary-Implementation-Table-2018_6-4.pdf
[34] Initially, the SSMP was expected to roll out with a series of wetland and water conveyance projects that were to create an "infrastructure backbone" that would have allowed successive projects to be tiered off as the sea receded. However now the State reports that it will build the first phase of projects to meet initial habitat goals and then continue to build the "backbone" as needed to extend across the playa. State officials say this will provide a narrower focus on getting projects on the ground and provide habitat sooner, but additional projects have not been identified. (Bruce Wilcox, pers. comm., Sept. 2018)
[35] *See* LAO (2018)
[36] Proposition 3, Chapter 6, Section 86080(o). *Available at* https://www.oag.ca.gov/system/files/initiatives/pdfs/17-0010%20%28Water%20Bond%29.pdf
[37] DWR (2018)
[38] A Memorandum of Understanding entered into between the State of California and the U.S. Department of Interior in 2016 provides $30 million in federal funding over ten years, which could be used for operations and maintenance. *See*

as Red Hill Bay and the Torres Martinez wetlands have suffered delays due to inadequate funds.[39] Moreover, the State has had difficulty spending the funds because of delays in the projects (due to design difficulties or property rights disagreements) and because the state is burdened with lengthy and complicated processes for bids, contracts, and issuing reimbursements.

RECOMMENDATIONS

Problem	Recommended Solution
The SSMP lacks adequate staff and authority to accomplish the program's goals in a timely manner.	Reform the SSMP to include adequate program staffing and authority with a primary office located in the Salton Sea region. • The program staffing should include a director and fulltime program staff with expertise in implementing habitat and air quality management projects.[40] • The program should also be supported by in-house communications, legal, and administration staff.
Lack of resolution around easements, leases, and potential future liabilities currently presents the most significant source of delay in implementing the SSMP.	Develop a process for rapidly identifying and resolving property and liability disputes. • The SSMP staff should include fulltime legal staff dedicated to resolving legal issues • Stakeholders involved in property rights disagreements should commit to a timetable to resolve differences or agree to third-party mediation to facilitation resolution.
Planning and permitting multiple projects across thousands of acres and with multiple landowners and agencies is extremely complicated and includes multiple potential sources of delay.	• The SSMP should include a more coordinated planning and master permitting process with local, state, and federal agencies to speed up project design, permitting, and construction.
Failure to engage local community members early in the planning process deprives them of meaningful opportunities to provide input, decreases the utility of projects, and undermines support for the SSMP	• Improve and maintain meaningful community engagement by actively soliciting community input early in the project planning process. • Budget and plan for SSMP projects that include recreation and other community benefits in addition to providing habitat and controlling dust.
The State of California's hiring, budgeting, contracting, and reimbursement processes are slow and inflexible, complicating implementation of the SSMP.	• The State and other stakeholders should adopt a long-term governance structure for the SSMP that provides more flexibility for faster implementation of projects than current state processes allow.

https://www.doi.gov/sites/doi.gov/files/press-release/mou-doi-cnra-saltonsea-signed.pdf To date, this federal commitment has not been fulfilled.

[39] Sahagun (2018)

[40] Appendix B provides an example organizational chart to provide a simplistic model for an improved SSMP structure.

Problem	Recommended Solution
The State's failure to initiate long-term planning immediately after the execution of the QSA in 2003 has significantly contributed to the lack of progress and ongoing delays that hinders the SSMP in 2018. A failure to engage in long-term planning now – even as the state is focused on Phase I –will contribute to future delays and conflicts. [41]	• Convene or reform the existing Long-range Planning Committee with a work plan and timeline to develop a long-range plan. • Consult individuals that participated in the Owens Lake Master Plan to apply lessons learned to the Salton Sea process.
The SSMP lacks a budget for ongoing monitoring, operations, maintenance, and adaptive management.	• Budget for operations, maintenance, monitoring, and adaptive management.[42] • The State and other stakeholders need to identify ongoing, long-term funding sources to build and maintain dust control and habitat projects at the Salton Sea.

CONCLUSION

While the State has made considerable progress in organizing and planning for management of the Salton Sea, it continues to struggle to implement a highly functioning Salton Sea Management Program that meets the challenge –and the legal mandate—of protecting public health and wildlife as the sea shrinks. Habitat projects continue to be delayed due to technical and legal challenges that would be more quickly resolved if the SSMP were adequately staffed, better organized, and appropriately authorized to implement projects efficiently.

Practical solutions at the Salton Sea are realistically achievable if the SSMP is adequately structured and prioritized by the State and other stakeholders. California has the funding, expertise, and political will to address the crisis, but it needs an improved SSMP and clear leadership – shared by the State and local communities—to act quickly and avoid the damage being inflicted on public health, birds and other wildlife, and local economies by inaction at the Salton Sea.

[41] Owens Lake provides a cautionary tale and a possible model for successful long-term planning. *See* Los Angeles Dept. of Water & Power. 2013. *Owens Lake Master Plan: transitioning to waterless and water-wise solutions*, *available at* https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=OPLADWP050832&RevisionSelectionMethod=LatestReleased

[42] Long-term ecological monitoring programs have been established at other lakes, such as Mono Lake and Owens Lake, which could serve as a guidance for how to monitor site conditions and know when certain conditions trigger management modifications.

APPENDIX A. LIST OF HABITAT PROJECTS AT THE SALTON SEA, STATUS, LESSONS LEARNED

Project Name	Description	Lead Agency	Status	Budget	Complicating Factors	Lessons Learned
Red Hill Bay[43]	520 shallow wetland	US Fish & Wildlife Service (USFWS)	Expected completion in 2019.	Unknown. Funding from Prop 84, Prop 1	• Resolution of lease. • Increased costs. • Difficulty in securing full funding	1. Initiate lease discussions early. 2. Involve local engineers early to anticipate challenges on playa.
Species Conservation Habitat – New River East	640 acres shallow wetland	Department of Water Resources (DWR)	• Initiated in 2008 • 100% designed • Permitted • Delayed by lease issues. Unknown completion date	• Est. $28 million. • Up to $35 million available • Funded by Props 50 and 84	• Resolution of leases. • Design challenges. • Potential to impact neighbor farms	1. Anticipate and resolve lease issues early. 2. Design for simplicity.
New River West	Up to 3400 acres	DWR	• Preliminary design • No completion date	• Unknown • $50 million available	• US Army Corps of Engineers has concerns regarding permitting "below" high water mark.	1. Improve inter-agency coordination 2. Consider master planning/permitting 3. Develop process to quickly resolve different legal interpretations
Alcott/Hell's Kitchen	55-60 acres shallow wetland	California Natural Resources Agency (CNRA) /DWR	• Preliminary design • Permitting initiated	• Unknown • $10 million from Prop 1 for initial work	• Desert pupfish. • Potential delay for adjacent geothermal development. • Requires additional design and financing.	4. Partnerships with geothermal companies may help projects. 5. Natural processes on site already creating habitat.
Torres Martinez Wetlands[44]	Up to 61 acres of shallow ponds	Torres Martinez Band of Desert Cahuilla Indians	• Phase I complete. • Phase II expected to be out to bid by 2019.	• Unknown, undergoing revision. [45] • Props 84 and 1 funding.	• Pond leakage requires lining. • Requires additional funding.	Include adaptive management in planning and budgeting.

[43] Red Hill Bay does not count toward the acreage goals set by the SWRCB November 2017 order.
[44] https://water.ca.gov/Programs/Integrated-Regional-Water-Management/Salton-Sea-Unit/Torres-Martinez-Wetlands
[45] Alberto Ramirez, pers. comm. (Sept. 26, 2018)

Project Name	Description	Lead Agency	Status	Budget	Complicating Factors	Lessons Learned
North Lake[46]	600-4200 acre deep water for habitat and recreation	Riverside County, CNRA	• Early development. • Expected 4 years planning. • Construction may start earlier using Design-Build.	• Est. $400 million. [47] • Partial funding from Prop 1. Exploring innovative funding sources.	• Technically challenging. • Financing requires. innovate solutions. • Concern of competition for funding for other projects.	Communities around the Salton Sea need to see projects that benefit their residents.
IID Managed Marsh[48]	959-acres of wetland and riparian habitat[49].	QSA JPA, led by IID[50]	• Phase I and II complete. • Phase III to start construction Jan 2019.	• Unknown.	• Adjacent farmers initially concerned.	1. IID improved design with each phase. 2. Prioritize "good neighbor" outreach and efforts. 3. Project used less water than initially planned.
Desert Shores Project[51]	28 acres shallow pond (Phase I)[52]	EcoMedia Compass, AGESS, Inc.	• Ongoing	• Unknown		

[46] For a recent presentation on the concept, *see* http://resources.ca.gov/wp-content/uploads/2018/06/10-YR-Plan-Mtg-N-Lake-June-2018_Final_ver2.pptx
[47] https://www.desertsun.com/story/news/environment/energy-water-summit/2018/01/11/riverside-county-has-plan-revitalize-salton-sea-and-pay/1015221001/
[48] The IID Managed Marsh is not officially part of the SSMP and does not count toward the 10-year goals. However, it provides important habitat in the area and lessons learned that may be applied to similar projects that are part of the SSMP. Documentation available at: https://www.iid.com/water/library/qsa-water-transfer/mitigation-implementation/managed-marsh-qsa-related-documents (Sept. 2018)
[49] Imperial Irrigation District. *Managed Marsh Complex Water Transfer Mitigation*, at 1 (available at https://www.iid.com/home/showdocument?id=14209 (Sept. 2018)
[50] https://www.iid.com/water/library/qsa-water-transfer/mitigation-implementation/managed-marsh-qsa-related-documents
[51] For an overview video, *see* https://www.youtube.com/watch?v=57EElv1AiRY
[52] http://www.agessinc.com/projects.html

Project Name	Description	Lead Agency	Status	Budget	Complicating Factors	Lessons Learned
Saline Habitat Ponds[53]	50-hectare (~100 acre) shallow ponds.[54]	Bureau of Reclamation and United States Geological Survey	• Operational 2006-2010. • Decommissioned because CDFW refused to maintain operations. • Ponds drained and dried.	• Est. $3 million capital costs. • $500,000 annual operations.	• Ponds colonized by more than 1 million desert pupfish despite efforts to exclude them. • Pumping Salton Sea water was problematic and expensive, increasing maintenance costs due to salt and barnacles.	1. Pumps not operational often, but ponds managed well with Alamo River water. 2. USGS published monitoring report, assessing ecotoxicity risk.[55]
Salton Sea Water Pilot Habitat Project[56]	Pilot to reclaim hyper-saline water from the Salton Sea for habitat. [57]	IID in partnership with Sephton Engineer, Inc.	• Cancelled. [58]	• Unknown • Awarded $692,819 from Financial Ass. Program • $100,000 BOR grant cancelled	• Project costs were not covered by initial funding. • Included promising, but untested technology. • Concern that accepting federal grant would not have covered costs associated with the grant itself (i.e, NEPA review).	1. Ensure state or federal grants are adequate to cover costs associated with project. 2. If possible, make pilot projects smaller to expedite full funding and testing of new techniques.

[53] Miles, A.K., Ricca, M.A., Meckstroth, A., and Spring, S.E., 2009, Salton Sea Ecosystem Monitoring Project: U.S. Geological Survey Open-File Report 2009-1276, 150 p, at 1-3, available at https://pubs.usgs.gov/of/2009/1276/pdf/ofr20091276.pdf
[54] *See* https://water.ca.gov/Programs/Integrated-Regional-Water-Management/Salton-Sea-Unit/Water-Habitat-Pilot-Project
[55] *Id*.
[56] http://www.sephtonwatertech.com/DocumentsPDF/SaltonSeawaterMarineHabitatPilot_ProjectDescription_2014_Oct_ver03.pdf
[57] http://www.sephtonwatertech.com/DocumentsPDF/SaltonSeawaterMarineHabitatPilot_ProjectDescription_2014_Oct_ver03.pdf
[58] http://www.sephtonwatertech.com/projects.html

APPENDIX B. EXAMPLE ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES FOR A SALTON SEA MANAGEMENT PROGRAM