



April 13, 2015

Little Hoover Commission  
925 I Street, Suite 805  
Sacramento, CA 95814

Dear Commission Members,

Thank you for the opportunity to testify on behalf of the Department of Fish and Wildlife regarding the Salton Sea. As per my conversations with your staff, the following testimony highlights the biological conditions relevant to understanding the challenges of restoring the Salton Sea, and provides an overview of the projects and activities that the Department currently funds or participates in.

The best place to start to understand the Salton Sea is with a list of the characteristics that distinguish this water body from most others. These characteristics drive the lake's problems:

- It is extremely shallow for its size. Shrunken to the size of a football field, it would only be one inch deep. This means the lake's water temperature will equilibrate rapidly with whatever the ambient temperature is.
- Water does not flow through to carry anything out of the lake. Water flows in, evaporates, and leaves behind whatever was dissolved or suspended in the water.
- It is overloaded with nutrients, mostly accumulated over time from agricultural drain waters. It has also accumulated relatively high levels of selenium, a result of the soils that the upper Colorado River drains
- The structure of the community of aquatic life is limited as far as species go- just a handful of fish and large invertebrate species, all of them introduced except for one small native fish.
- The population dynamics of the aquatic species can best be described as boom and bust, exhibiting both phenomenal growth and precipitous declines.
- What currently survives in the lake are species adapted to handle water that is fifty percent more salty than ocean water.

People like to reminisce about how, in its heyday, the Salton Sea was the playground for Hollywood stars, attracting larger numbers of visitors annually than Yosemite, with waters perfect for boating and waterskiing, swimming and fishing. They yearn for those good old days at the Salton Sea, and want to see them return. Today's reality is that we can never restore the lake to its glory days. Once the Quantification Settlement Agreements were signed, restoration of the Salton Sea was no longer a technically feasible goal. There is just not enough water available to overcome the losses from evaporation that will continue to occur. What will be

possible is a mosaic of land use that must include wildlife habitat, brine sinks, and air quality control areas.

### **Salinity changes over time**

One way to understand the history of the lake is by following its chemistry over time. When first filled at the beginning of the 20<sup>th</sup> Century, it was with Colorado River water, containing the Colorado River organisms that came in when the basin filled. As the lake became saltier, the (then) Department of Fish and Game stocked it with a variety of fish species from the Gulf of California in Mexico. The three fish species that took hold created a wildly popular sport fishery. Added to this mix in the 1970s were the tilapia which unexpectedly invaded the lake from irrigation drains. As the salinity became greater than ocean water levels in the early 2000s, we lost the marine fish species. Today, the lake still teams with tilapia, a boon to both anglers and fish-eating birds. Yet, the fishery is on borrowed time, as the salinity is climbing still higher, ultimately towards lethal levels.

### **The Salton Sea's value to California's birds**

Since California has lost over 95% of the wetlands present when Spanish explorers arrived, the remaining ones now provide life-saving oases to migrating birds. The "accidental" Salton Sea now takes the place of some of those lost wetlands, providing an irreplaceable resource on the Pacific Flyway. Over 400 species of birds reside at, or migrate through, the Salton Sea ecosystem. The return of data on birds banded at the Salton Sea has shown that these birds range from Alaska to Mexico, but also across the continental divide to the prairie pothole region, and the Gulf Coast.

### **So what exactly is ailing the Salton Sea?**

The Golden Years at the Salton Sea started to tarnish during the 1970s. An unconnected series of publicity black eyes created the perception that the Sea was polluted and unsafe to swim in or fish from.

- Large-scale fish die-offs, sometimes in the millions, were unexplained, and assumed to be the product of some form of pollution, possible inputs of contaminants for the New River.
- The New River had been dubbed the most polluted river in the state, as it flowed from Mexico, sporadically carrying raw sewage when outdated treatment plants in Mexico were overwhelmed during storm events.
- A health advisory was issued by the Office of Environmental Hazard Health Assessment during the same period that advised a very conservative level of Salton Sea fish consumption, due to their selenium content.
- Bird die-offs in the tens of thousands occurred during the 1990s, driven by outbreaks of botulism poisoning and avian cholera.

All these events combined to create a public perception that the Salton Sea was dangerously polluted- a place to be avoided.

### **The reality behind the fear**

The Department of Fish and Game developed a Salton Sea Program in 2001 to address and if possible, mitigate, the wildlife impacts the Salton Sea was presenting. We began quarterly fish surveys and joined our Federal partners in the US Fish and Wildlife Service to survey for bird disease and remove sick birds and carcasses. The cycle of large bird die-offs were effectively broken by this effort.

As our fish sampling efforts allowed us to characterize trends in the fisheries, scientists unraveled the mystery of the large-scale die-offs. It turns out that the troublesome fish kills are not driven by pollution or poisoning, but that fish are merely suffocating when the oxygen-depleted lower layers of water are brought to the surface by high winds. The upwelling of these lower layers brings up the dissolved ammonia and hydrogen sulfide gasses that are byproducts of decomposition of organic residues at the lake bottom. These gasses produce the infamous odors detectable many miles distant from the Salton Sea.

In the early 2000s, we documented the disappearance of the marine sport fish species from the lake, likely because it became too saline for these species to reproduce.

The New River pollution problem has been partially addressed in recent years, due to the construction of a new water treatment facility in Mexico. There continues to be a low level of concern about inputs of pesticide residues into the lake, but the human pathogens present in the river do not persist in its hypersaline waters.

Research undertaken on selenium risk to humans from Salton Sea fish has created advisories for levels of fish consumption that are much more liberal than OEHHA originally published. Concern has been much reduced as our understanding of selenium effects on humans has advanced over the last several decades.

### **The impending ecological disaster**

During the 100-plus years the Salton Sea has been around, the increasing salt and nutrient levels have always placed it on a trajectory for disaster. It has always been clear that, without intervention, at some tipping point we would lose the fisheries. With recent QSA-driven reduced water inputs, that tipping point is now racing towards us. The lake won't be "dead" but will undergo huge changes to its aquatic biological community. These changes will eventually almost eliminate the value of the lake to wildlife. For fish eating birds, there will be almost no value, other than for a brief rest during migration, lacking in food or fresh water. The potential for human health risks is also real and troubling. As the lake shrinks, the exposed lakebed is expected to allow the wind-borne transport of dust that will create health issues for residents of the Coachella and Imperial Valleys. Imperial Valley already experiences impaired air quality and resultant human health issues, including high levels of asthma in children.

### **The beginnings of a solution**

Without past levels of water inputs, whole sea restoration is no longer the appropriate goal. And without large amounts of dedicated funding, much of the lost ecological values will be lost forever. The Department has as part of its mission a stand-alone goal to protect and conserve the fish and wildlife dependent upon the Salton Sea. The first effort underway is the

creation of 640 acres of habitat that will support a fishery for the fish-eating birds, named the Species Conservation Habitat project. The shallow ponds will be filled with New River water blended with Salton Sea water, to create salinity somewhere around ocean salinity (a salinity of 20 to 40 parts per thousand, versus around 35 parts per thousand for seawater). We have finished its design and environmental documentation and permitting, and are in the early stages of selecting contractors for construction. We expect construction to begin this fall. Our partners in this endeavor are the Department of Water Resources, the Imperial Irrigation District, and the Wildlife Conservation Board.

In addition, we have dedicated some Salton Sea funding to a Financial Assistance Program (FAP), granting money for other habitat creation and technology development efforts:

- The Red Hill Bay project is being executed by the US Fish and Wildlife Service's Sonny Bono Salton Sea Wildlife Refuge. With IID and the Wildlife Conservation Board as additional funding partners, they will recover around 600 acres of newly-dried lake bed by the Alamo River. This shallow saline habitat is targeted at the suite of invertebrate-eating shorebirds that use the Salton Sea.
- The Torres Martinez Desert Cahuilla Indians are using FAP funds to restore and improve the infrastructure of existing freshwater wetlands on tribal lands. They have partnered with the Salton Sea Authority for this project.
- Sephton Water Technology is a private firm, which has partnered with IID in a pilot project partially funded by FAP. The project will explore the application of a proprietary thermal desalination technology for its potential to generate electricity and provide water for habitat creation.

Last, but not least, the Department has channeled \$2 million to the Salton Sea Authority to fund a restoration feasibility study. We hope that these early steps and initial projects are just the beginning of a much larger investment in the Salton Sea that can begin with Proposition 1 funding.

Sincerely,

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