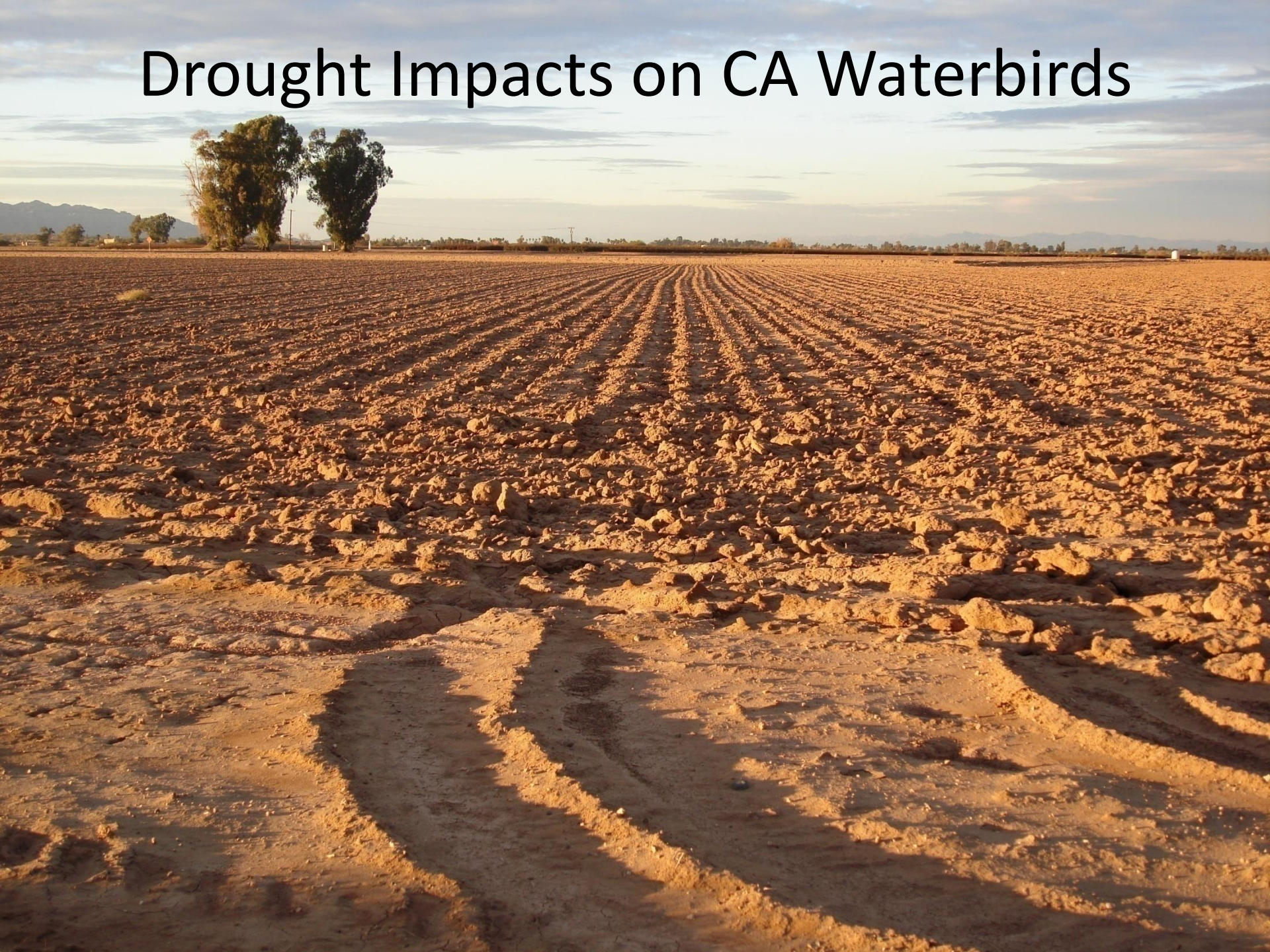
Drought Impacts on CA Waterbirds

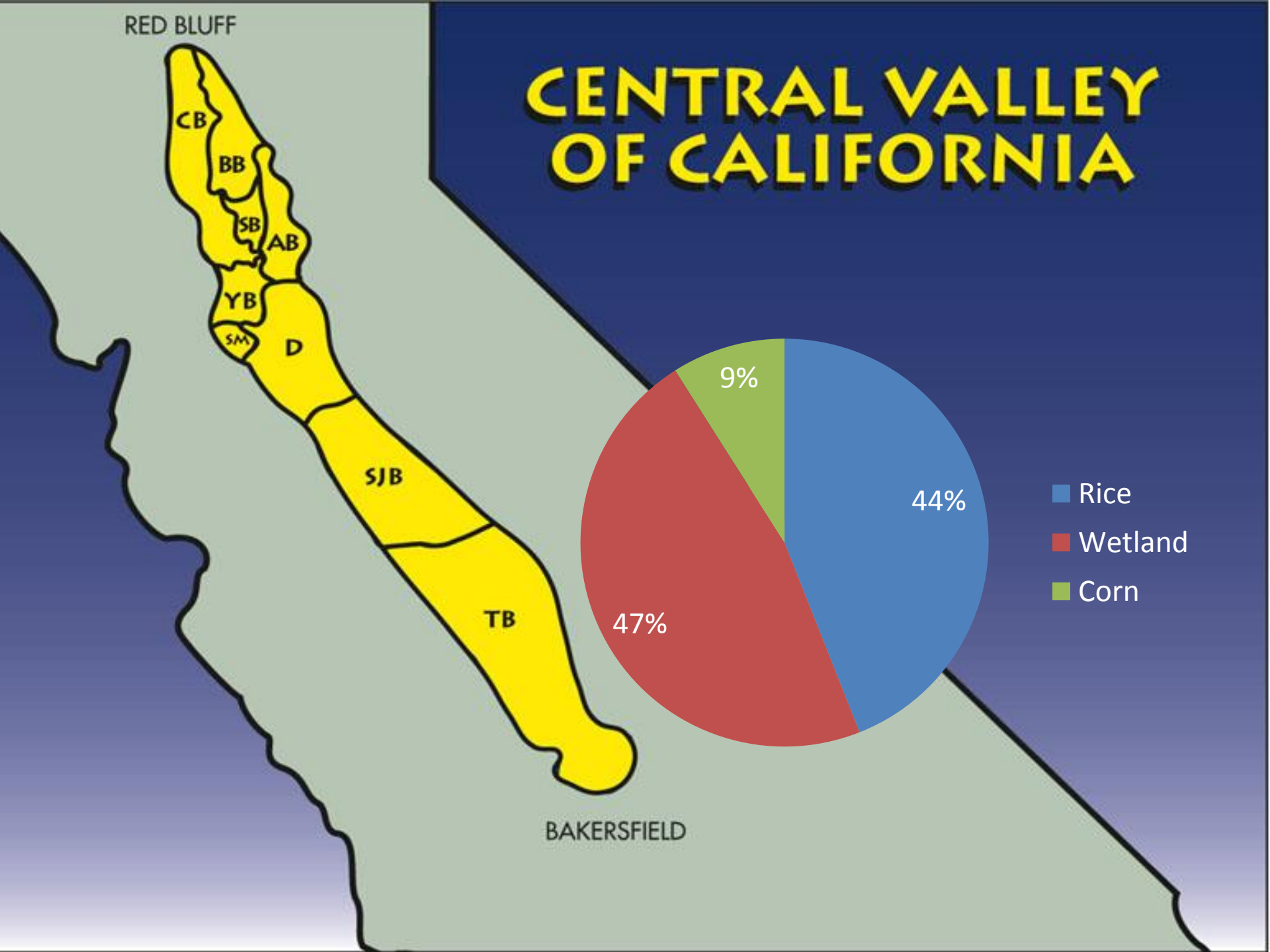


Panel Members

- Mark Petrie: Ducks Unlimited
- Mark Reynolds: The Nature Conservancy
- Ellen Wehr: Grassland Water District
- Jeff Volberg: California Waterfowl Association
- Mike Lynes: Audubon

Background

- Six to eight million wintering waterfowl
- Highest density in the world
- 90% -95% wetland loss
- Waterfowl-friendly agriculture
- Intensively managed wetlands


RED BLUFF
CENTRAL VALLEY OF CALIFORNIA
CB
BB
SB
AB
YB
SM
D
SJB
TB
BAKERSFIELD
9%
44%
47%
Rice
Wetland
Corn

Annual Mileposts

- Spring plantings (rice & corn)
- Summer irrigation of wetlands
- Fall Flooding of wetlands
- Winter-flooding of harvested rice fields

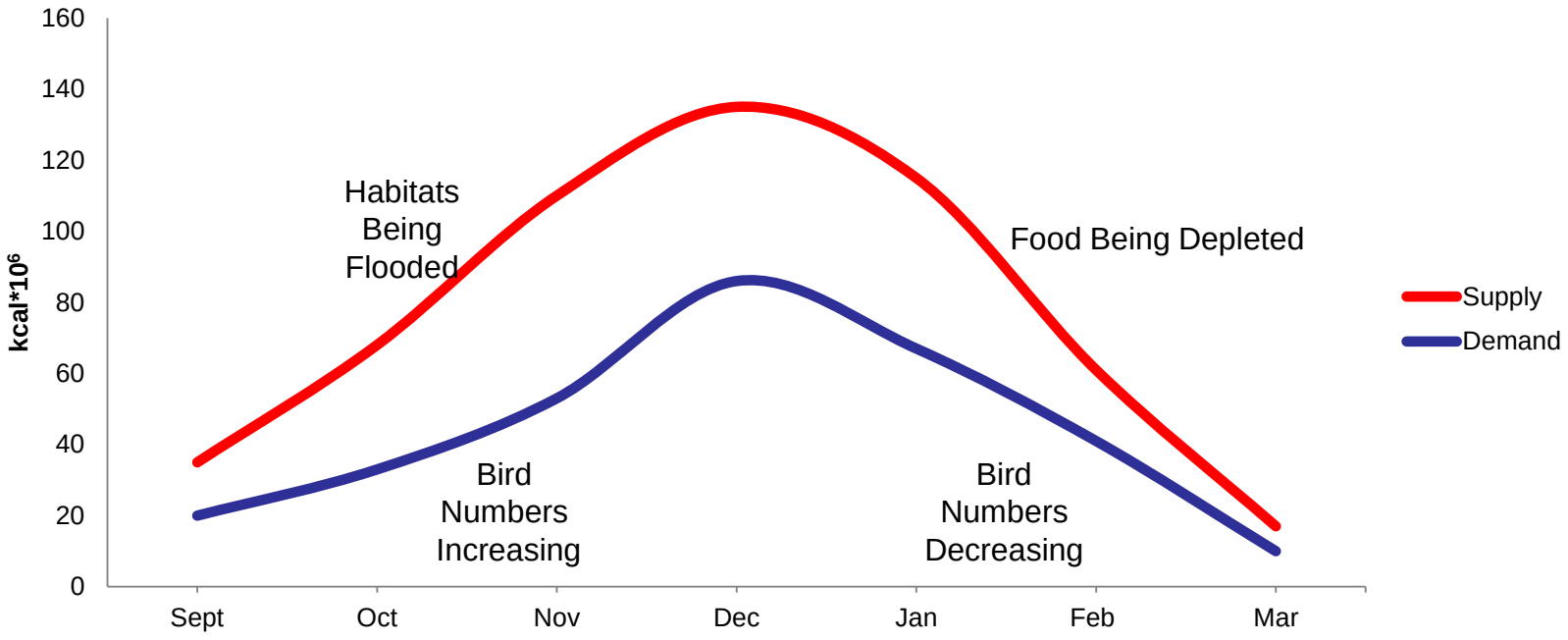
Waterfowl Habitats

Habitat Types	Normal Water Year	2015 Drought
Planted Rice	567,000	406,000
Planted Grain Corn	62,000	35,000
Summer Irrigated Wetlands	60%-70%	10%
Fall flooded wetlands	207,000	155,000
Winter-Flooded Rice	351,000	50,000 – 75,000

Summer Irrigation of Wetlands

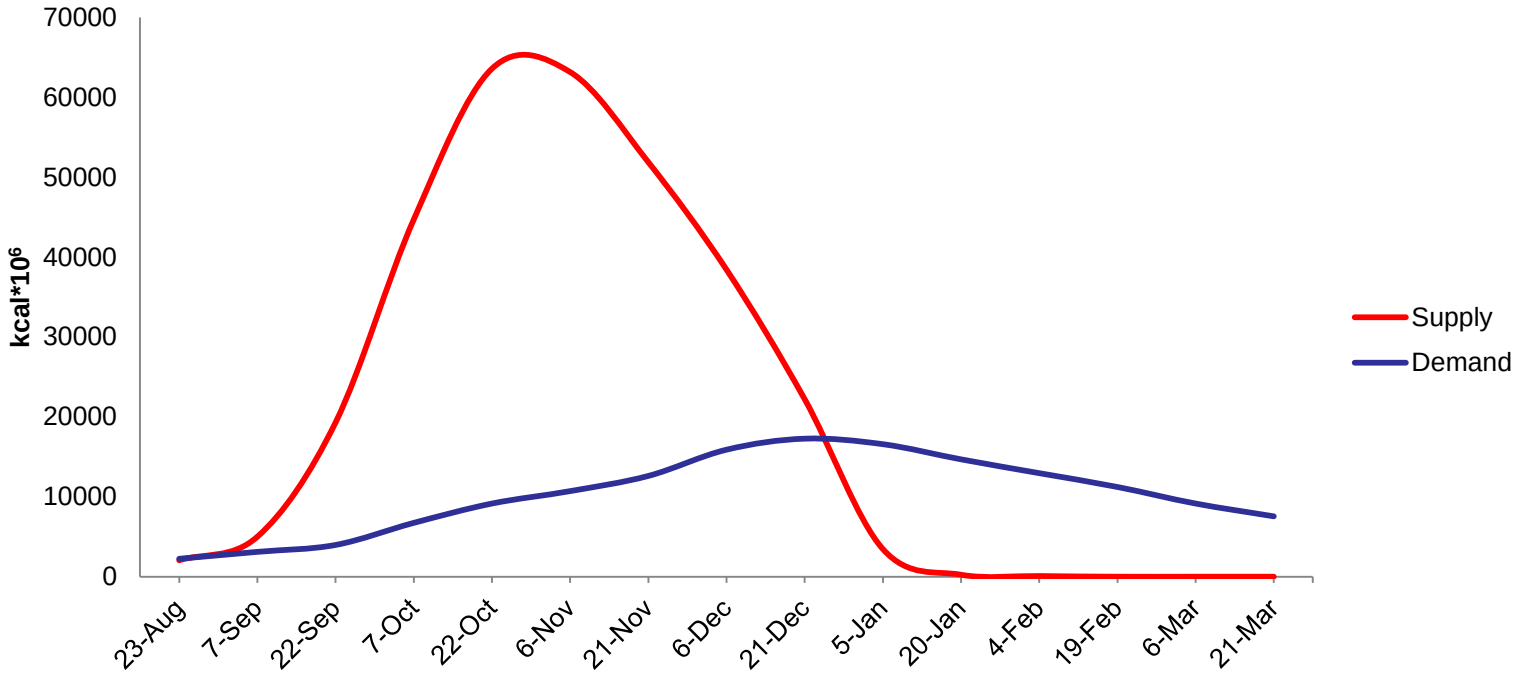
- 70% of managed seasonal wetlands summer irrigated (M. Brown 2008)
- Estimated that only 10% of wetlands will be summer irrigated in 2015.
- Food production in non-irrigated wetlands only 56% of irrigated wetlands (Naylor 2002).
- Overall, a 50% decline in foods provided by managed wetlands

Food Supply vs. Food Demand



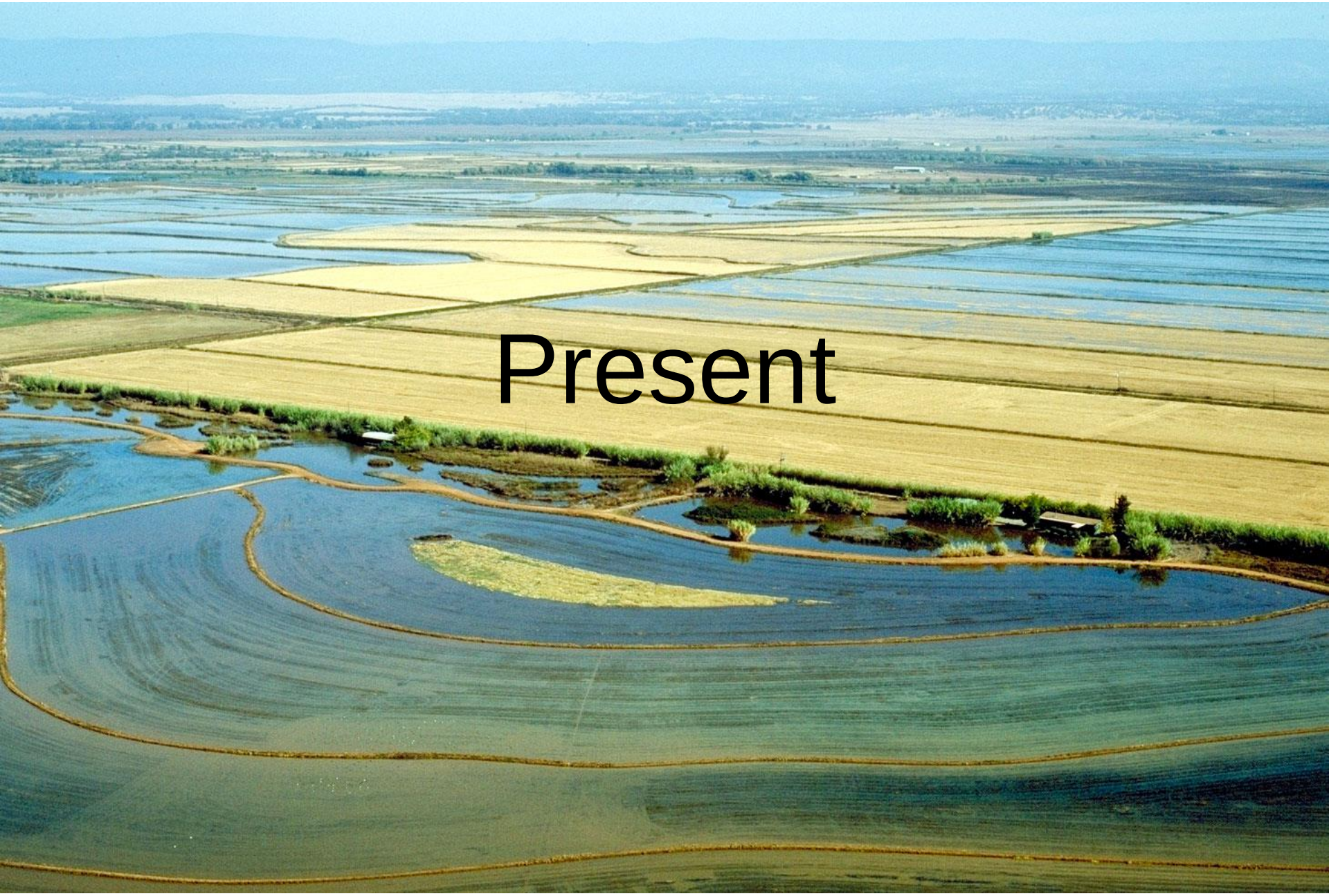
Food Supply vs. Food Demand

2015 Drought



Long-Term Concerns


Past


Present

Future ?

What is the cost of replacing winter-flooded rice with managed wetlands …..

About 2 Billion Dollars

The Nature Conservancy

Protecting nature. Preserving life.®

California Shorebirds and Drought

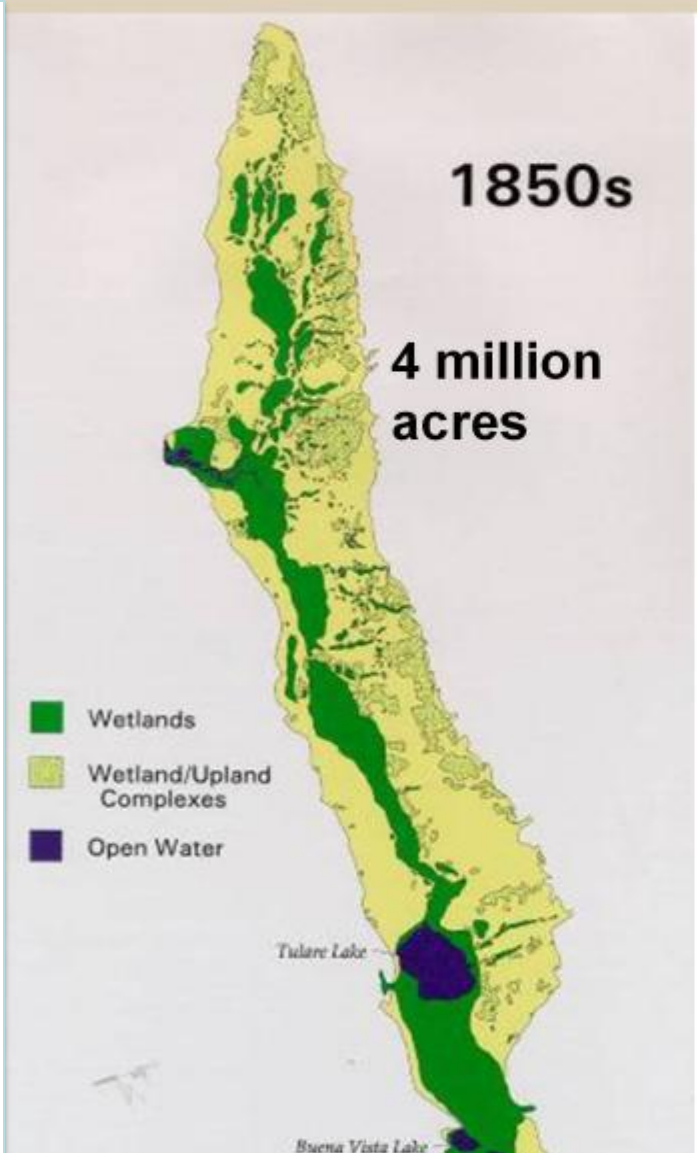
State Water Resources Control Board Workshop on Drought

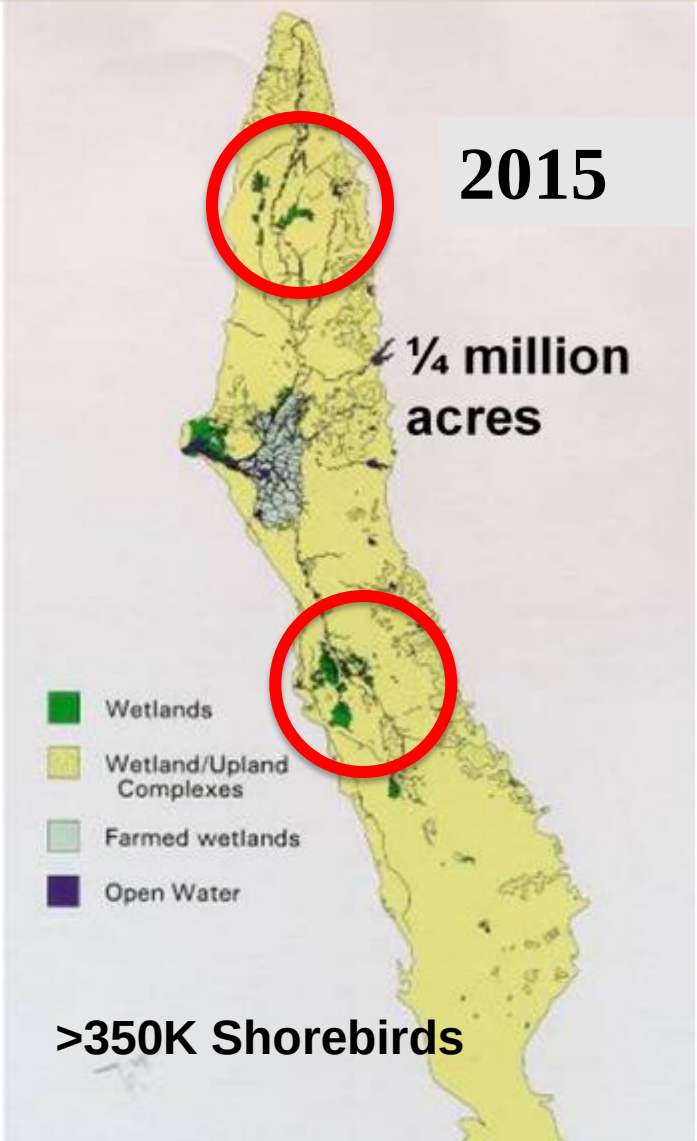
Photos: (top to bottom) © Jack Kelly Clark, Erika Nortemann/TNC, Ramona Swenson/TNC

Central Valley Shorebirds

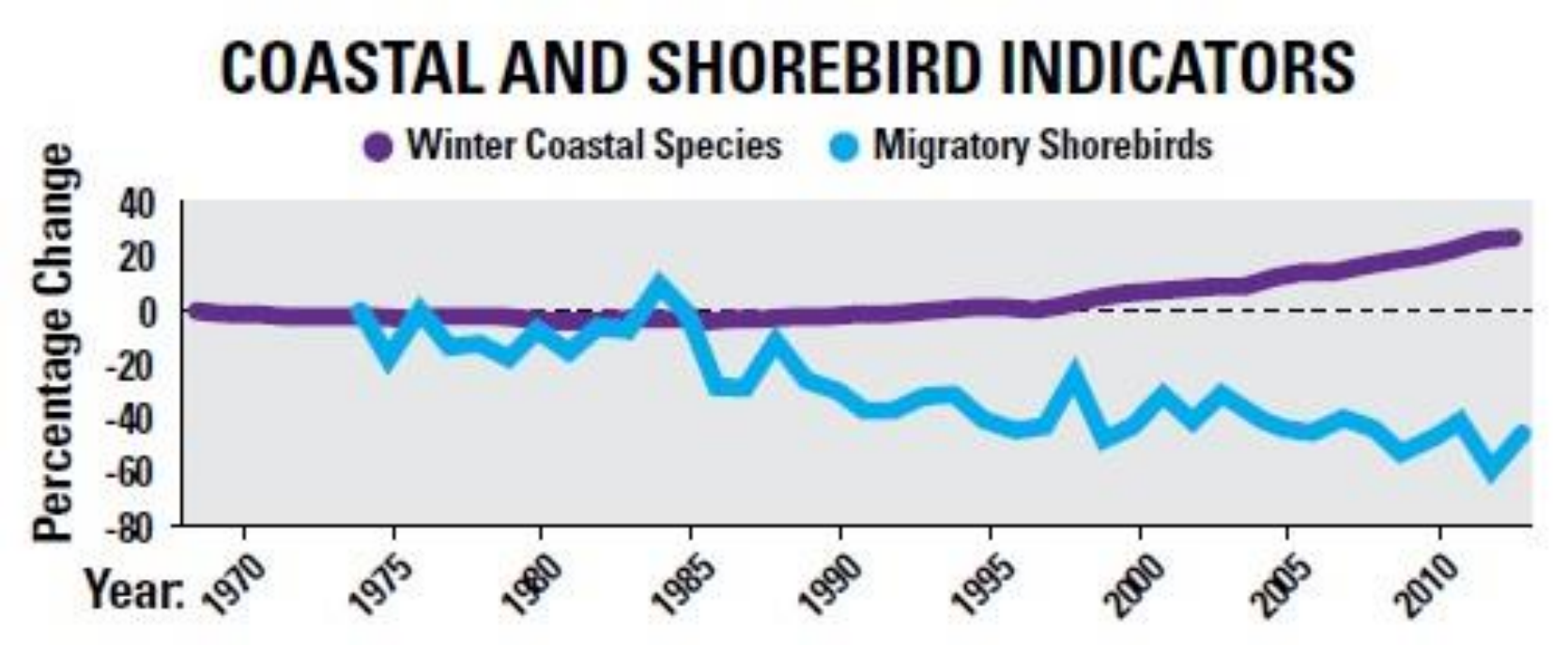
- long distance migrants
- 33 spp, many declining
- > 350K shorebirds, Int'l importance of CV
- Depend on seasonal, shallow water habitats
- Managed wetlands & agriculture
- Drought stress, vulnerability & adaptive management

Wetland Loss in the Central Valley



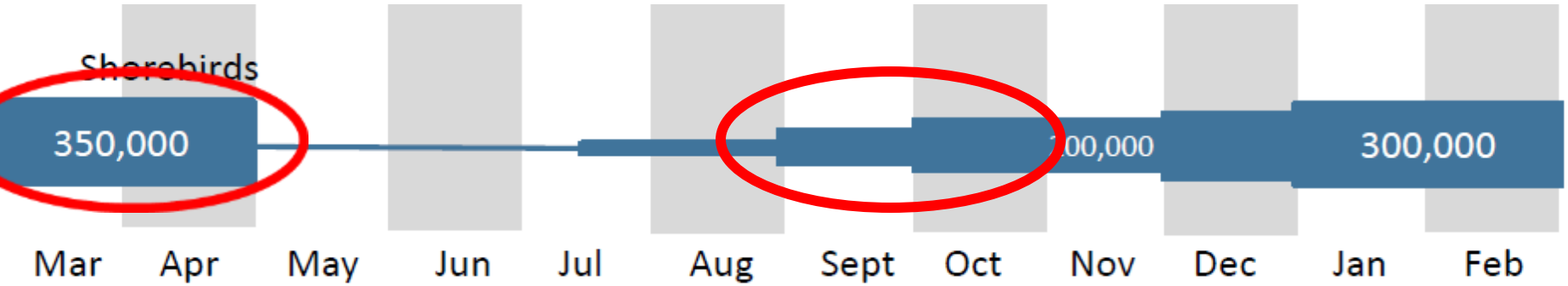


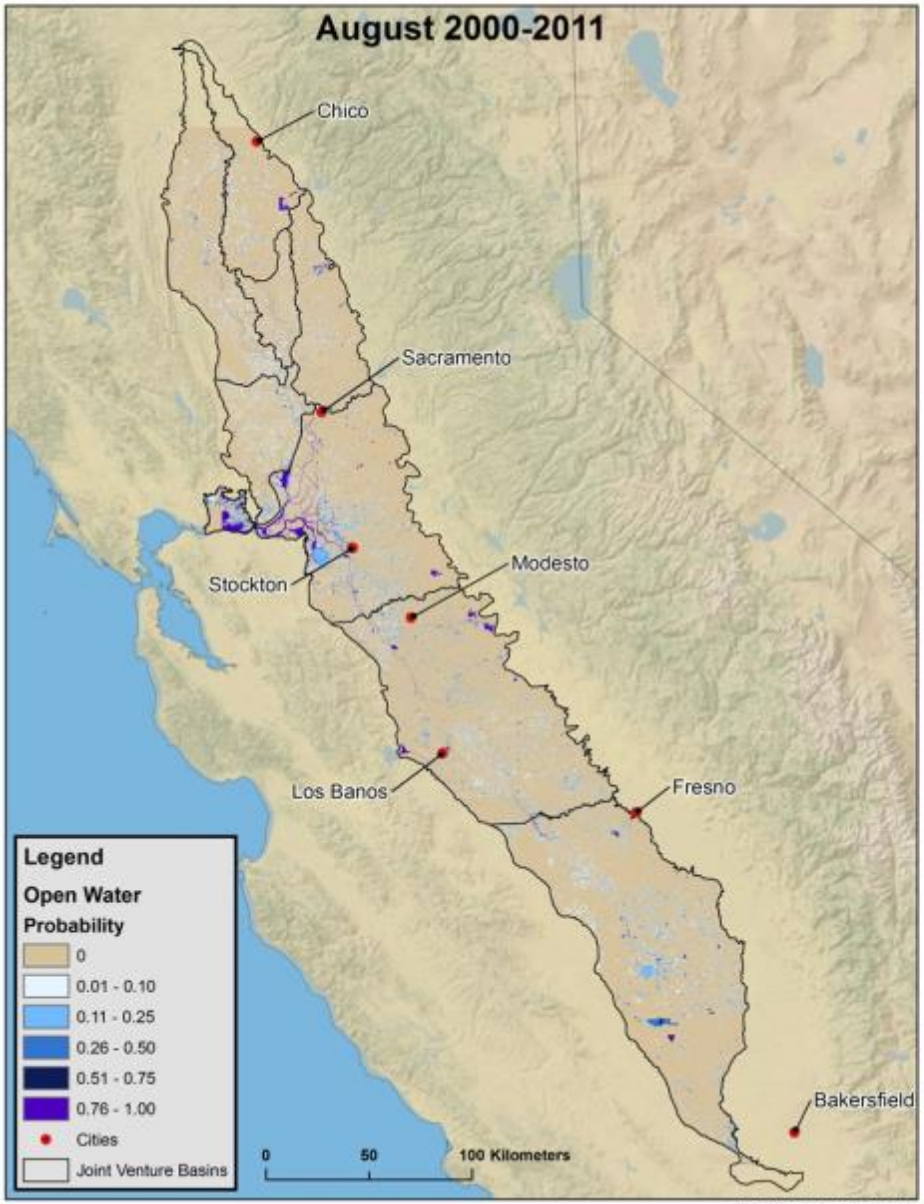
igratory Shorebirds – 50% decline since 1970s

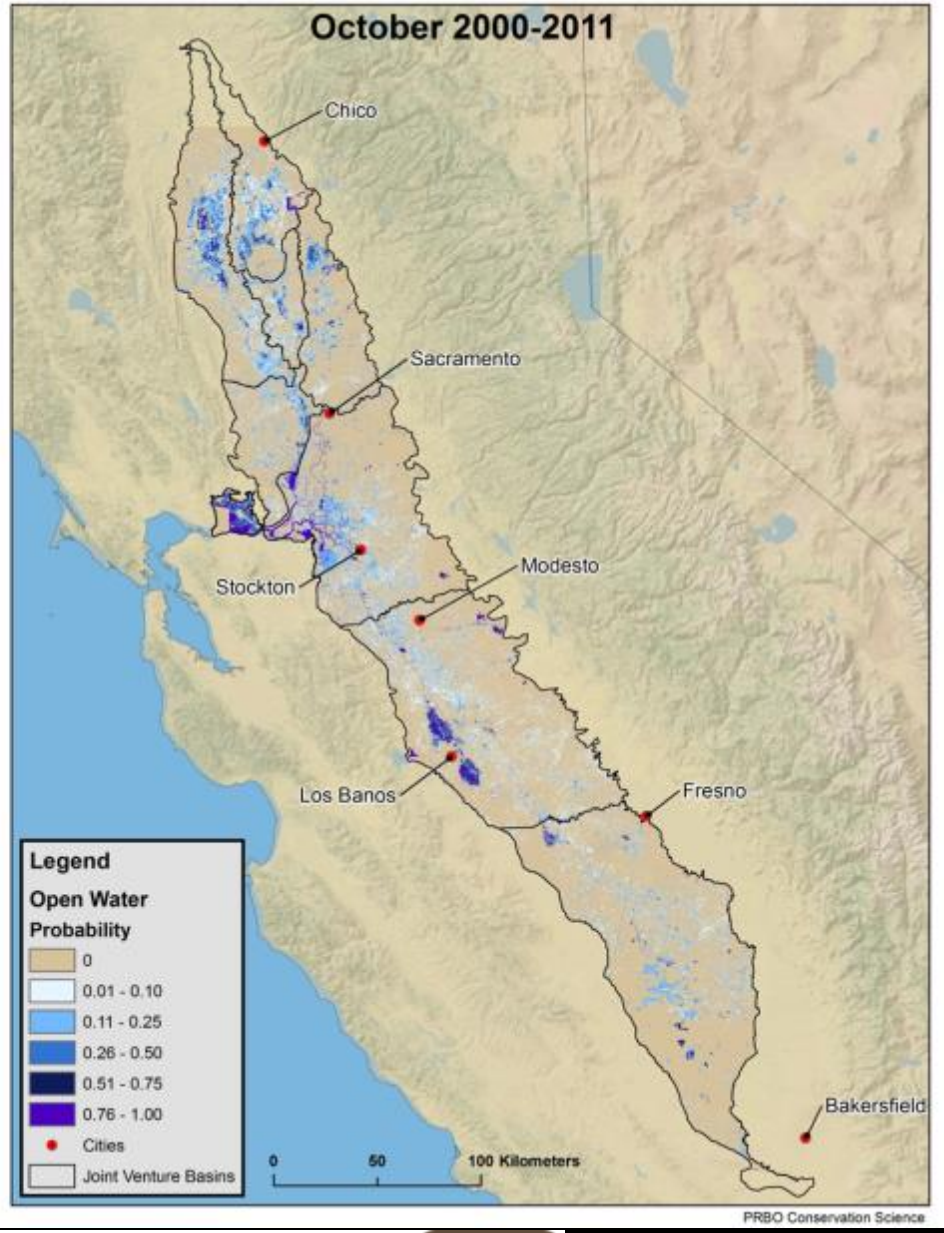


State of the Birds 2014

Importance of Fall & Spring







Point Blue Conservation Science

Audubon California

The Nature Conservancy
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CA LCC

U.S. Fish & Wildlife Service

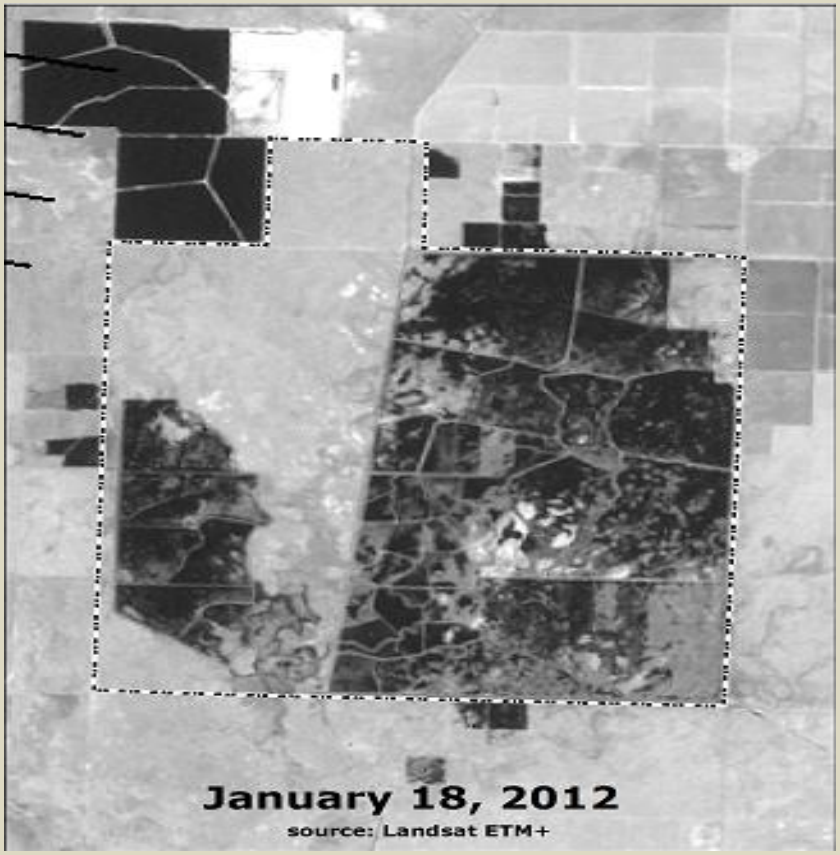
Effects of Drought on Shorebirds

- Vulnerability – declining populations, low productivity, high energetic requirements = stress & mortality
- Seasonal effects – less water in fall and spring when shorebirds need it most
- Long-term effects – decreased survivorship, crashing populations
- Shorebird habitat enhancement programs depend on reliable, cost-effective water

Drought adaptive management

- Adaptively manage opportunities for water delivery – including reuse
- Maintain decomposition and winter flooded rice
- Mitigate effects of water transfers
- Collaborate to balance needs of birds and fish

South of Delta Refuges:
2014 Drought Impacts and 2015 Uncertainty



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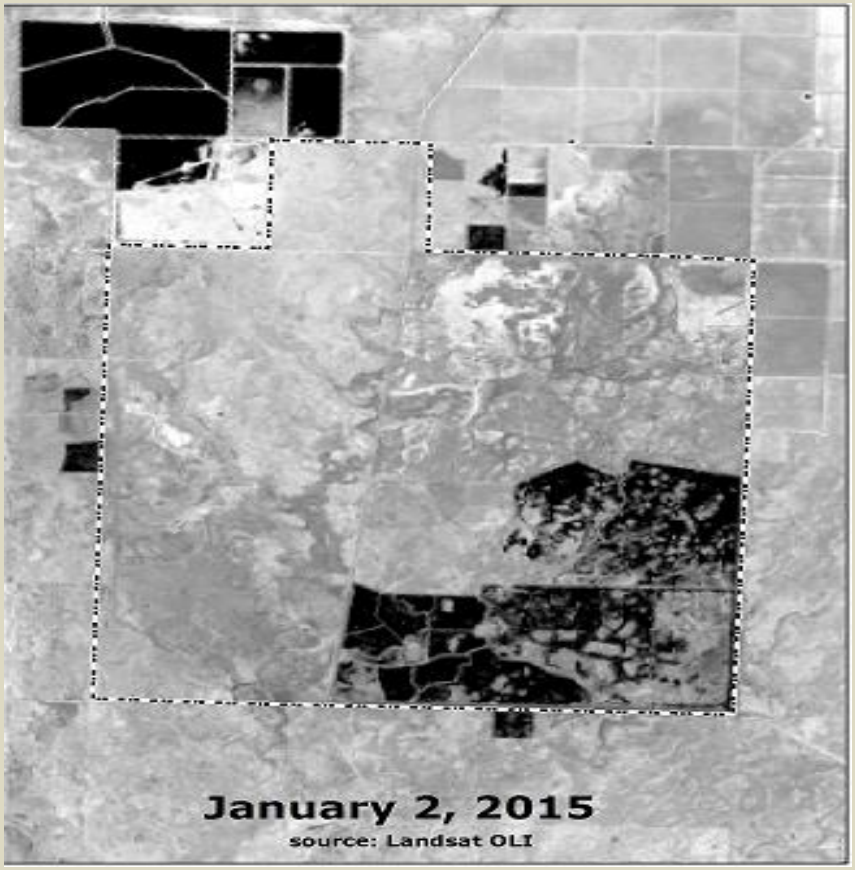


Kern National Wildlife Refuge

2014 Impacts

Reduced Water Supply:

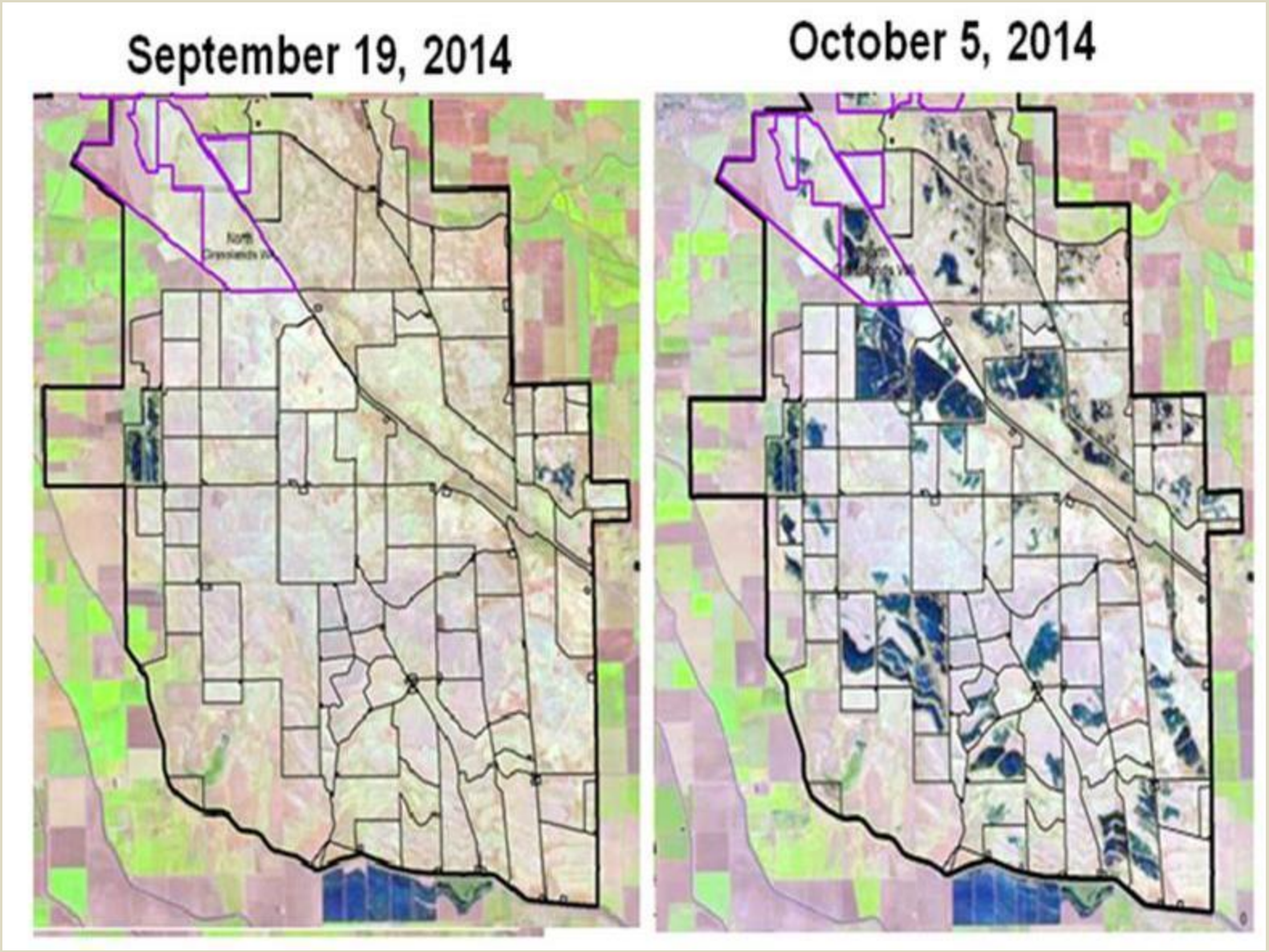
- 47% total CVPIA requirement:
  - 65% Level 2 allocation (only 12 of 15 SOD refuges)
  - 13% Level 4 (groundwater)
- No deliveries until October

Reduced Habitat:

- 70% decrease in spring/summer habitat
- 40% decrease in winter habitat (even with December rains)

Disease, Decline, Loss of Recreation:

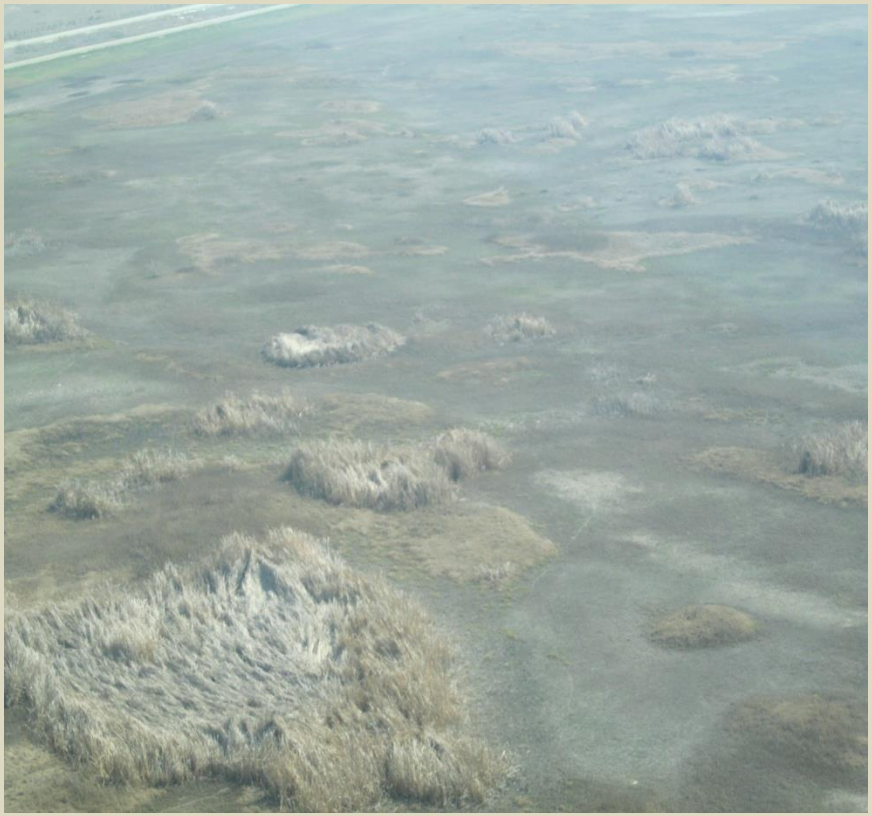
- Sacramento Valley: highest avian cholera since 1990's
- San Joaquin Valley: food depleted, decline in migratory birds
- Local species struggling, hunting delayed, low visitation



South Grassland Resource Conservation District

Kern NWR Unit 6, January 2012

Kern NWR Unit 6, January 2015



2015 Uncertainty

Still No Allocation or Delivery Schedule:

- "It may not be possible to get much water to the refuges until after Sept. 15th."

Lack of Information:

- Refuges remain dry despite need for spring deliveries.
- "We don't have any more allocation information at this time."

Complications of Extending the Transfer Window?

- Sac River Temp. Mgmt. Plan "re-operates transfer volumes to the fall."
- Likelihood of interference with refuge water deliveries

Refuge Water Supply Condition No. 1:

- Reclamation shall promptly consult with CVP refuge contractors regarding forecasted operations and shall provide all requested information concerning forecasting, operational assumptions, and the proposed timing and quantity of refuge water deliveries.

Refuge Water Supply Condition No. 2:

- **Reclamation shall maintain regular consultation with refuge contractors in the fall and winter months to share information regarding current hydrological and biological conditions, and shall work with refuge contractors to adaptively manage the delivery of refuge water supplies as needed.**

Refuge Water Supply Condition No. 3:

- **Water transfers resulting from the 2015 Framework of Actions for the Sacramento River and the Sacramento River Temperature Management Plan shall not impair or interfere with the availability or delivery of water supplies to refuge contractors.**

Thank you!

GRASSLAND WATER DISTRICT

State Water Resources Control Board

Workshop on Drought

Refuges and Rice

- Rice farms serve as surrogate wetlands
  - Rice grains lost at harvest are primary food source for migrating birds
  - Winter floodup for rice decomposition provides vital habitat
- Multiple benefits from rice farming
  - Habitat
  - Food
  - Air quality

Multiple Uses, Multiple Benefits

- Multiple use of water is a key component of water use efficiency
- Rice farming involves both consumptive and non-consumptive uses of water
- Drainage of non-consumptively used water provides a water source for wildlife habitat during the migration season
- Winter flooding of rice fields for decomposition provides multiple environmental benefits

Multiple Use in Drought

- During the drought, multiple uses of water have been constrained by
  - Emphasis on maintaining cold water pool
  - “No-spill” requirements for water districts
  - Curtailment of water rights to drainage canals

Colusa Drain – Canal 2047

- In 2014, California Waterfowl asked Board to lift curtailment of water rights in the Colusa Drain
  - Drainage water is used to flood up to 10,000 acres of habitat for migrating birds and other wetlands-dependent species
- The Board's executive director stated the Board would be willing to lift the curtailment, if the Bureau of Reclamation and the Department of Water Resources would agree

Colusa Drain – Canal 2047

- BOR did not respond until after November rains
- DWR never responded
- Despite no-spill policies, there was a significant amount of water in the Drain in September and October that could have been used for habitat
- Water in the drain is warm and dirty
- Use for wetlands habitat cools and cleans water before it is once again drained into the Sacramento River

Multiple Uses, Multiple Benefits

- Curtailments of water rights to non-consumptively used (drainage) water prevent multiple uses and multiple benefits
- California Waterfowl will renew its request that the curtailment of water rights to the Colusa Drain be lifted
- Thank you

Overview

- Central Valley wetlands are essential for waterfowl, shorebirds, and other birds along the Pacific Flyway.
  - Historically: 20-40 million waterfowl; today down to 6-8 million
  - >350,000 shorebirds annually
  - Less than 10% natural wetland habitat remaining

- Drought is having severe impacts on habitats and birds
  - 30% decline in planted rice
  - 25% reduction in managed wetlands…worse SOD
  - Little to no summer irrigation
  - 80% decline in winter-flooded rice
  - Significant food shortages for waterfowl
  - Loss of 50% of shorebird habitat

Audubon CALIFORNIA

Adapting Management Needed during Drought

- Greater communication on a real-time basis between Reclamation, refuge contractors, and other stakeholders

- Greater flexibility in water management
  - Manage flows available at different times for their best uses.

- Maintaining and enhancing culture of multiple use/multiple benefit in water management.
  - Water can be managed to benefit agriculture and wildlife
  - Where transfers occur, should consider environmental impacts