Reconnecting the Colorado River to the Sea

SONORAN INSTITUTE

PROGRAMA DELTA *del* RÍO COLORADO

/SonoranInstituteMx

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Sonoran Institute

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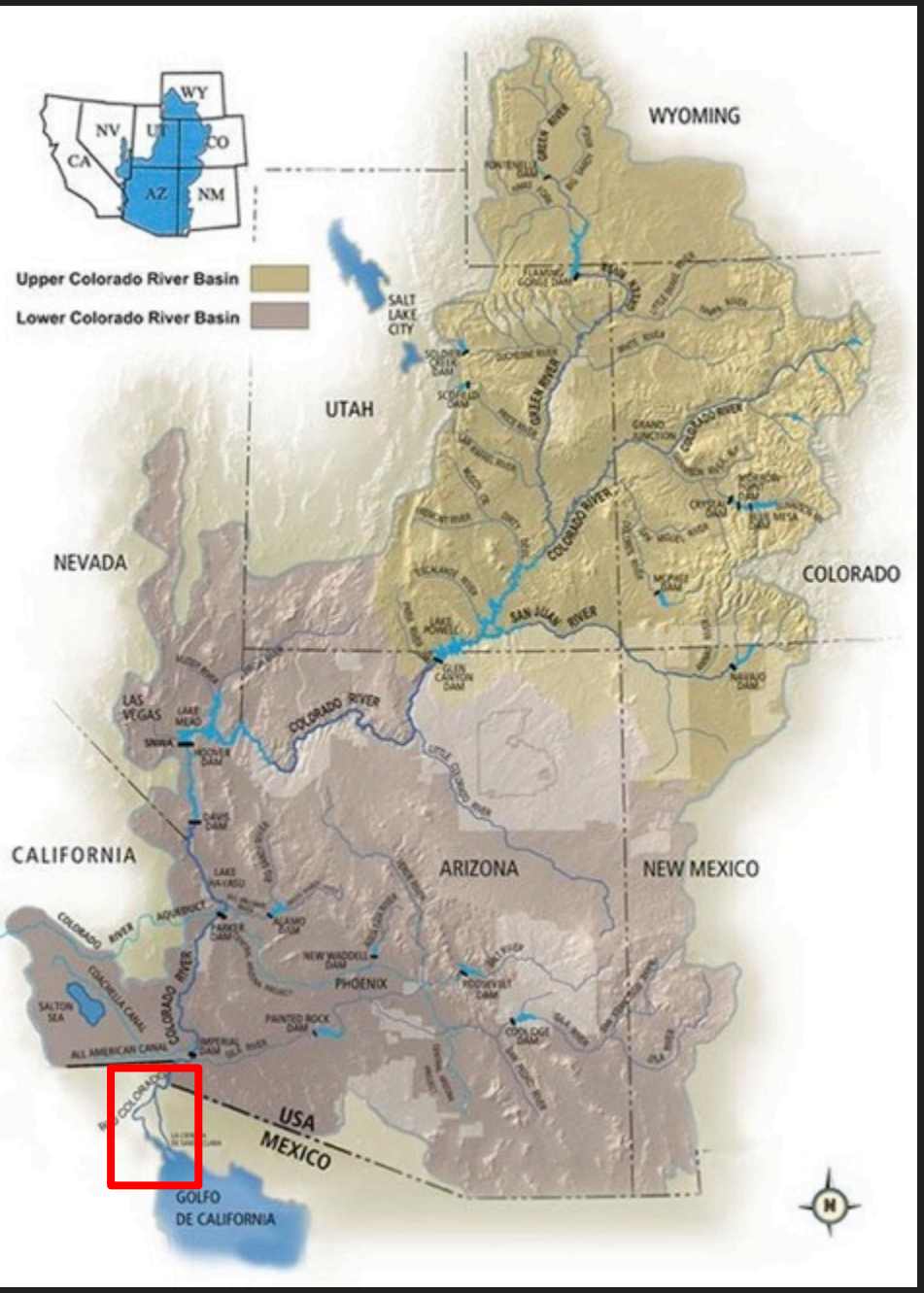
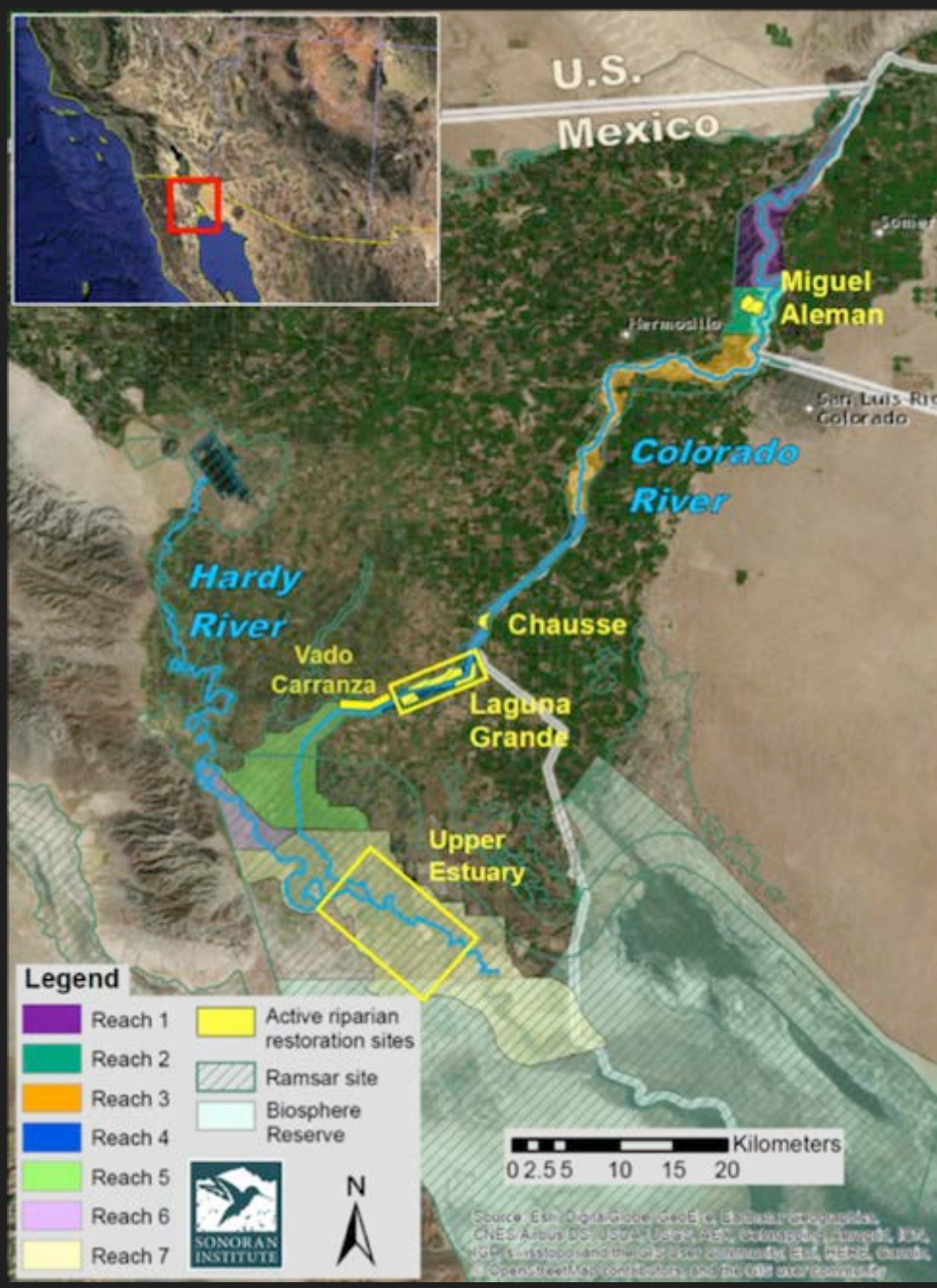
NCER, New Orleans

Photo: Bill Hatcher, Sonoran Institute


WY
NV
UT
CO
CA
AZ
NM
Upper Colorado River Basin
Lower Colorado River Basin
WYOMING
SALT LAKE CITY
UTAH
NEVADA
COLORADO
CALIFORNIA
ARIZONA
NEW MEXICO
LAS VEGAS
PHOENIX
USA
MEXICO
GOLFO DE CALIFORNIA
N


U.S.
Mexico
Miguel Aleman
Hermosillo
San Luis Rio Colorado
Colorado River
Hardy River
Chausse
Vado Carranza
Laguna Grande
Upper Estuary
Legend
Reach 1
Reach 2
Reach 3
Reach 4
Reach 5
Reach 6
Reach 7
Active riparian restoration sites
Ramsar site
Biosphere Reserve
SONORAN INSTITUTE
N
Kilometers
0 2.5 5 10 15 20

The Problem:

Lack of freshwater flows and physical connectivity between river and sea

LOWER COLORADO RIVER IN MEXICO

About 15 miles from its mouth

July 23, 2009 – looking upstream during a very high tide

August 2009 – looking upstream note evidence of the river channel

Mexicali earthquake: April 4, 2010
Post earthquake – looking upstream

Restoration goals

- Restore estuarine (brackish) conditions
- Create spawning and nursing habitat for marine species
- Increase the extension and frequency of flooded areas
- Reduce surface water salinity


U.S.
Mexico
Miguel
Aleman
Hermosillo
San Luis Rio
Colorado
Colorado
River
Hardy
River
Chausse
Vado
Carranza
Laguna
Grande
Upper
Estuary
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Reach 1
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restoration sites
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Reserve
SONORAN
INSTITUTE
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Kilometers
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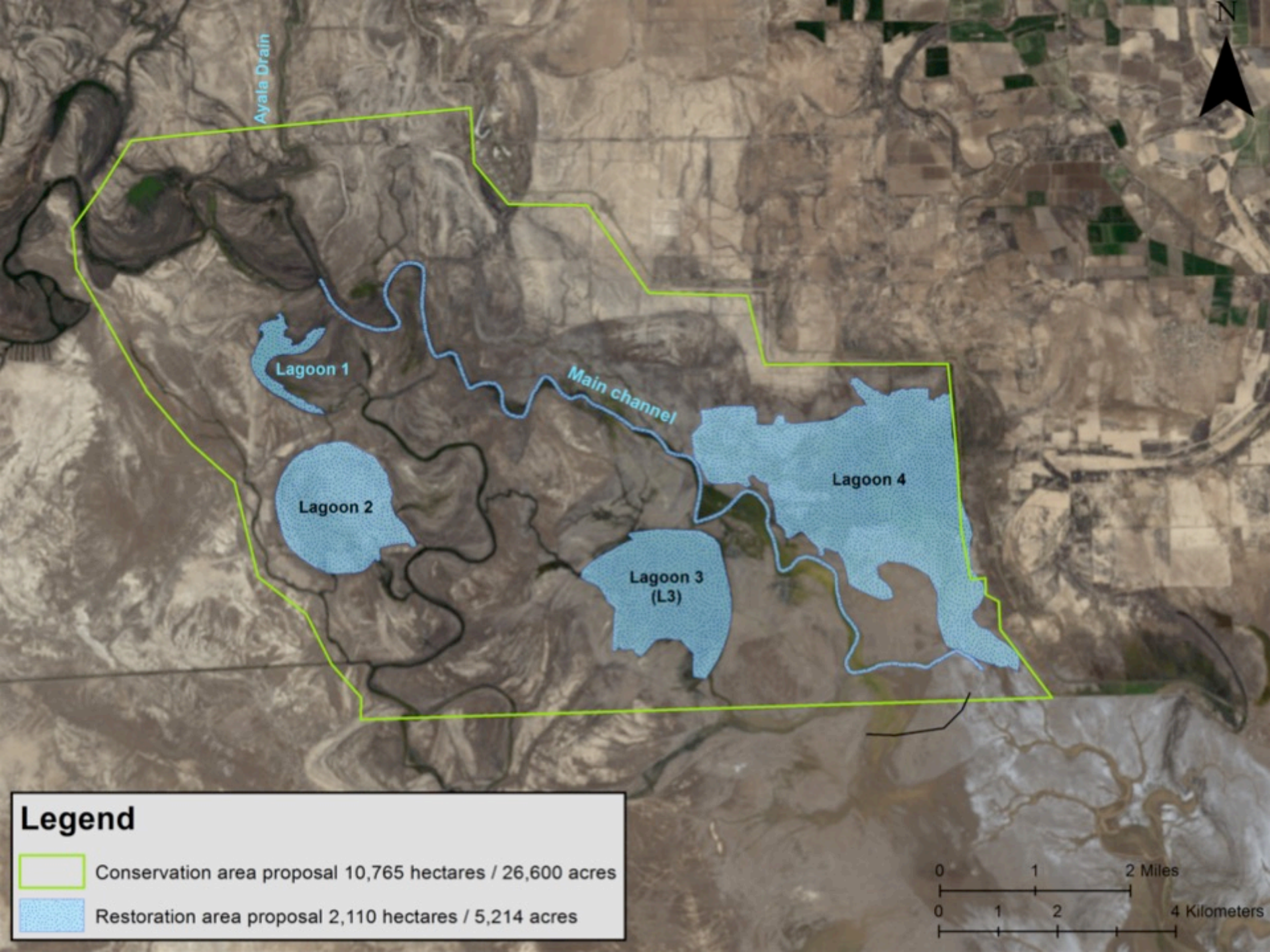

Ayala Drain
Lagoon 1
Main channel
Lagoon 2
Lagoon 3
(L3)
Lagoon 4
N
Legend
Conservation area proposal 10,765 hectares / 26,600 acres
Restoration area proposal 2,110 hectares / 5,214 acres
0
1
2 Miles
0
1
2
4 Kilometers

PARTNERS

RAISE THE RIVER
RECONNECT THE COLORADO

CONAGUA
COMISIÓN NACIONAL DEL AGUA

CIAD

pro natura
noroeste ac

SEMARNAT
SECRETARÍA DE MEDIO AMBIENTE Y RECURSOS NATURALES

ESTADOS UNIDOS MEXICANOS

The Nature Conservancy

CONANP
COMISIÓN NACIONAL DE ÁREAS NATURALES PROTEGIDAS

Restoration Strategies:

- Augment freshwater flows
  - Effluent flows
  - Agricultural return flows
  - Purchase and lease water rights
  - US-Mexico water allocations
- Remove sediments to enhance channel connectivity

RESTORATION ACTIONS

Water Deliveries:

Pilot flow deliveries and monitoring

- Different flow delivery points
- Varying flow rates
- Varying frequency and duration of flows


RESTORATION ACTIONS
Removing sediment barriers

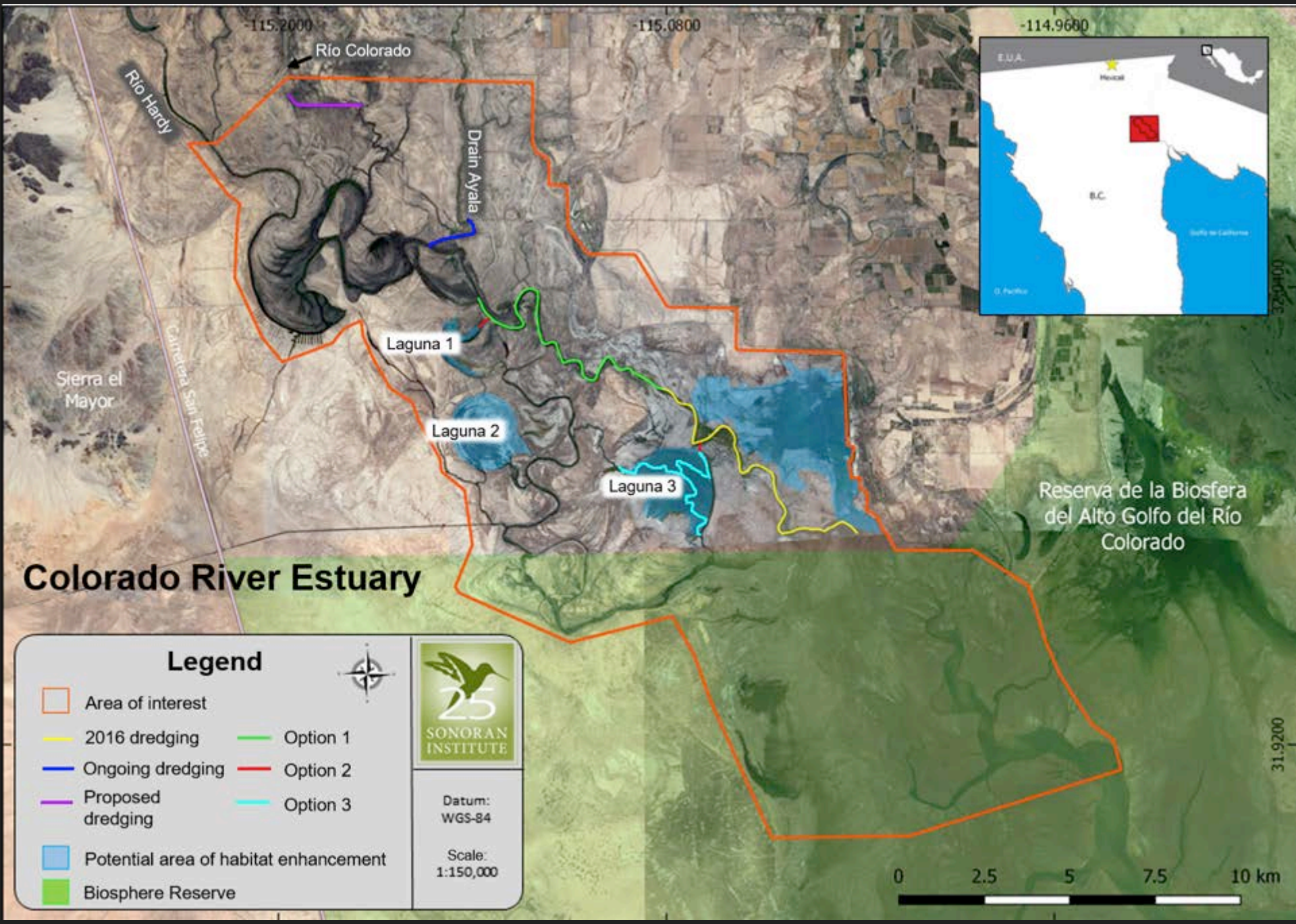
Sediment Removal

Main river-tidal channel:

- 0.6 km sediment removal by hand
- 9.4 km sediment removal with machinery

Input channels:

- 1.8 km of Ayala drain channel input (machinery)

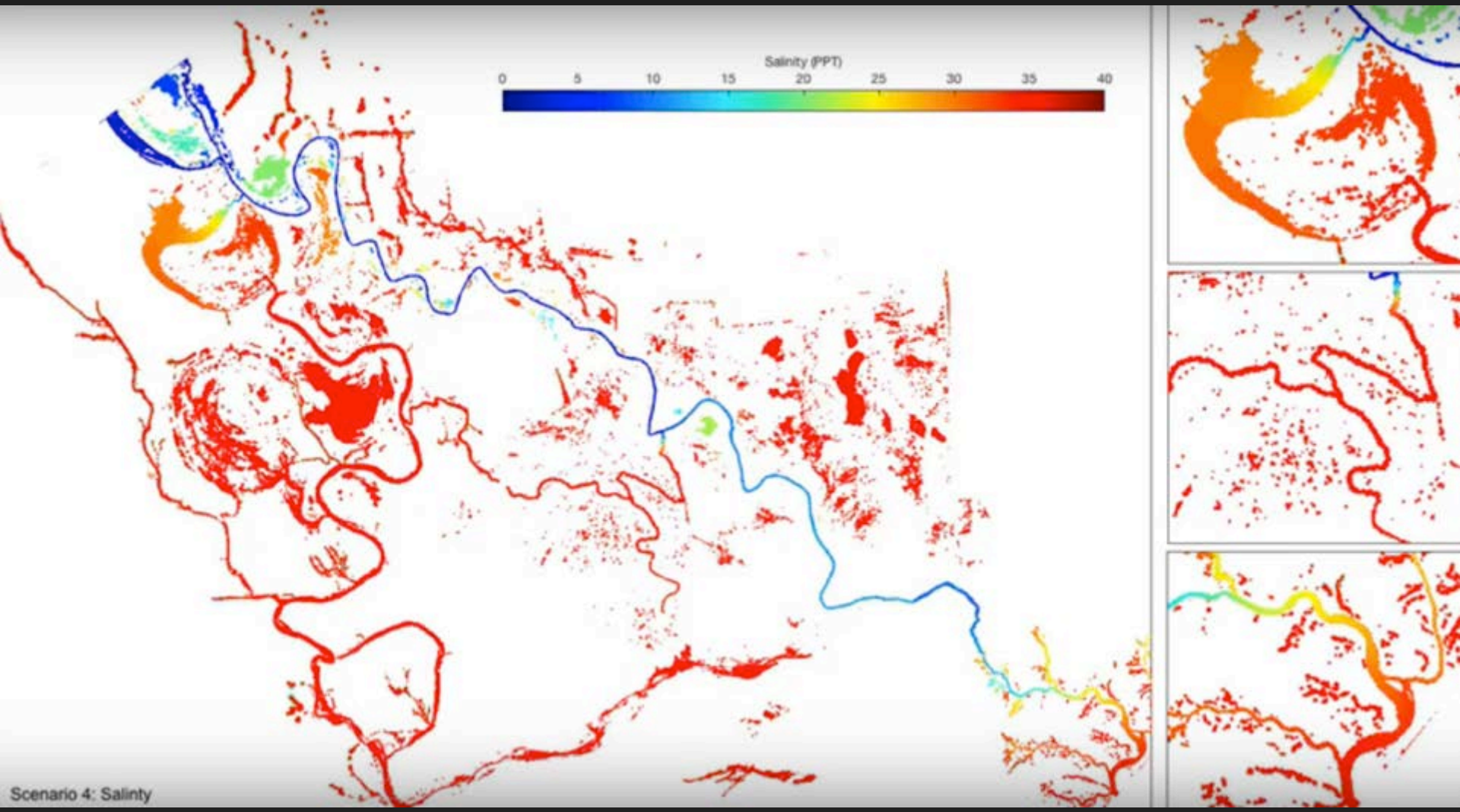

-115.2000
-115.0800
-114.9600
Río Colorado
Río Hardy
Drain Ayala
Laguna 1
Laguna 2
Laguna 3
Sierra el Mayor
Carretera San Felipe
Reserva de la Biosfera del Alto Golfo del Río Colorado
E.U.A.
Nevada
B.C.
Golfo de California
O. Pacífico
Colorado River Estuary
Legend
Area of interest
2016 dredging
Ongoing dredging
Proposed dredging
Option 1
Option 2
Option 3
Potential area of habitat enhancement
Biosphere Reserve
SONORAN INSTITUTE
Datum: WGS-84
Scale: 1:150,000
0
2.5
5
7.5
10 km
31.9200

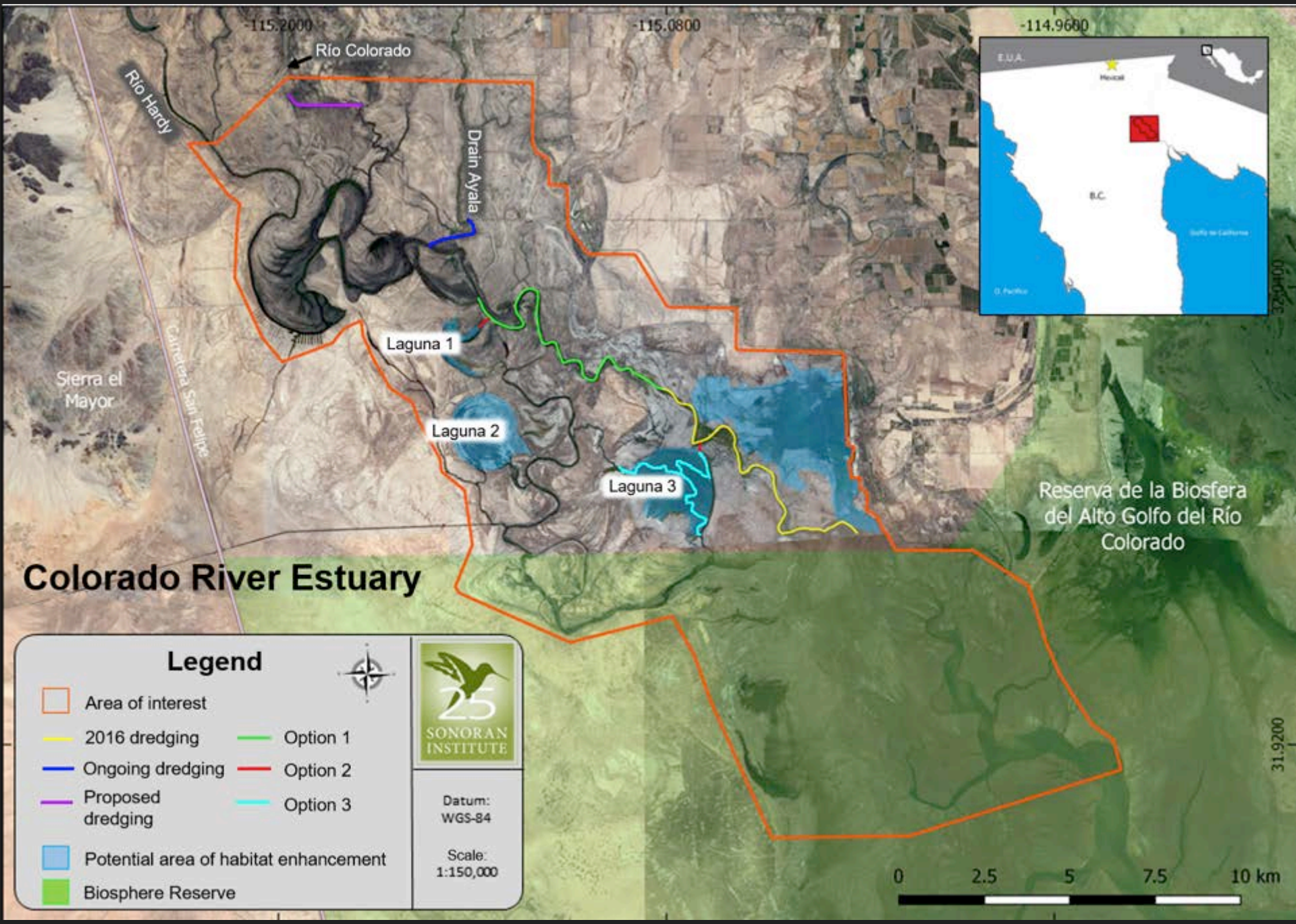
Restoration Impacts

- Decreased surface water salinity
- Freshwater flows from Hardy reach upper estuary and sea
- Implications for flow delivery design

Planned Restoration Activities

Hydrodynamic Modeling

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Restoration Targets 2019-2020

- Surface water connectivity extended by 20 km (12.4 miles)
- 2,110 hectares (5,213 acres) enhanced estuarine habitat
- Targeted flow release of up to 17.2 million m^3 (14,000 acre-feet)

Acknowledgements

Thank You!

Photo by Bill Hatcher

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