CHOKED OUT: BATTLING INVASIVE GIANT CANE (*ARUNDO DONAX*) ALONG THE RIO GRANDE/BRAVO BORDERLANDS

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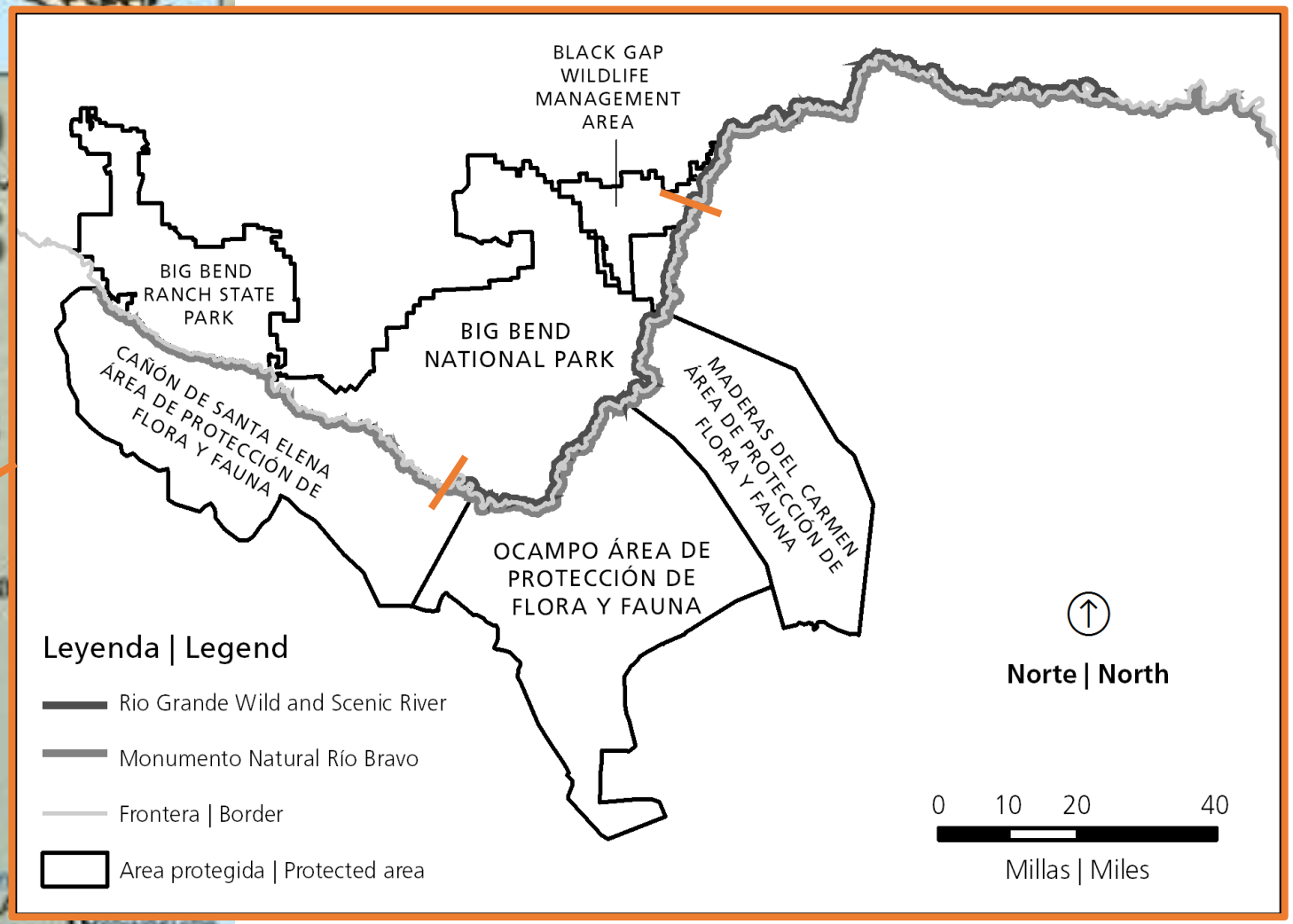
Geography

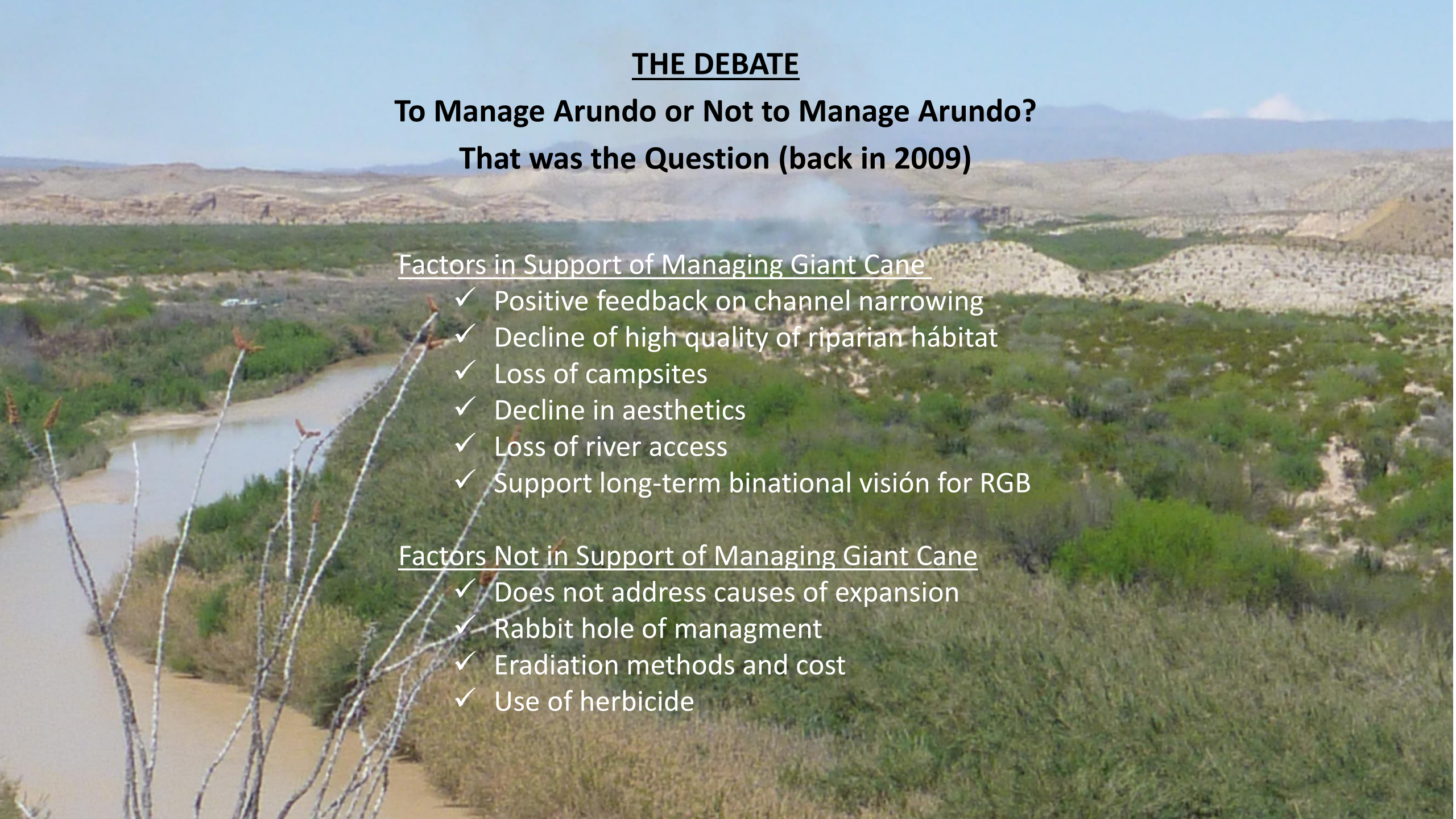

COLORADO
Española
Santa Fe
Albuquerque
NEW MEXICO
UNITED STATES
Las Cruces
El Paso
Carlsbad
Odessa
Ciudad Juárez
Pecos
TEXAS
Río Grande
Pecos
CHIHUAHUA
Amistad Res.
Del Rio
Eagle Pass
Piedras Negras
Chihuahua
Conchos
COAHUILA
Laredo
Nuevo Laredo
Monclova
Torreón
Monterrey
Reynosa
Matamoros
DURANGO


BLACK GAP WILDLIFE MANAGEMENT AREA
BIG BEND RANCH STATE PARK
BIG BEND NATIONAL PARK
CAÑÓN DE SANTA ELENA ÁREA DE PROTECCIÓN DE FLORA Y FAUNA
MADERAS DEL CARMEN ÁREA DE PROTECCIÓN DE FLORA Y FAUNA
OCAMPO ÁREA DE PROTECCIÓN DE FLORA Y FAUNA
Leyenda | Legend
Rio Grande Wild and Scenic River
Monumento Natural Río Bravo
Frontera | Border
Area protegida | Protected area
Norte | North
0 10 20 40
Millas | Miles

The Binational Team

The Binational Team

- Comision Nacional de Areas Naturales Protegidas (CONANP)
- Big Bend National Park
- Community Leaders
- Texas Parks and Wildlife Department/WMA
- Universities: Universidad de Antonio Narro, Sul Ross State University, Utah State University, Chihuahua University
- Businesses and Foundations: Fundacion para la Nautraleza (Carlos Slim), The Coca-Cola Company, Dorris Duke Foundation, Friends of BIBE
- Other Agencies: IBWC/CILA, CONAGUA, USGS, NOAA
- Private Organizations: RGSSS, CEMEX, WWF, Fuego Verde, Rio Grande Joint Venture



THE DEBATE

To Manage Arundo or Not to Manage Arundo?

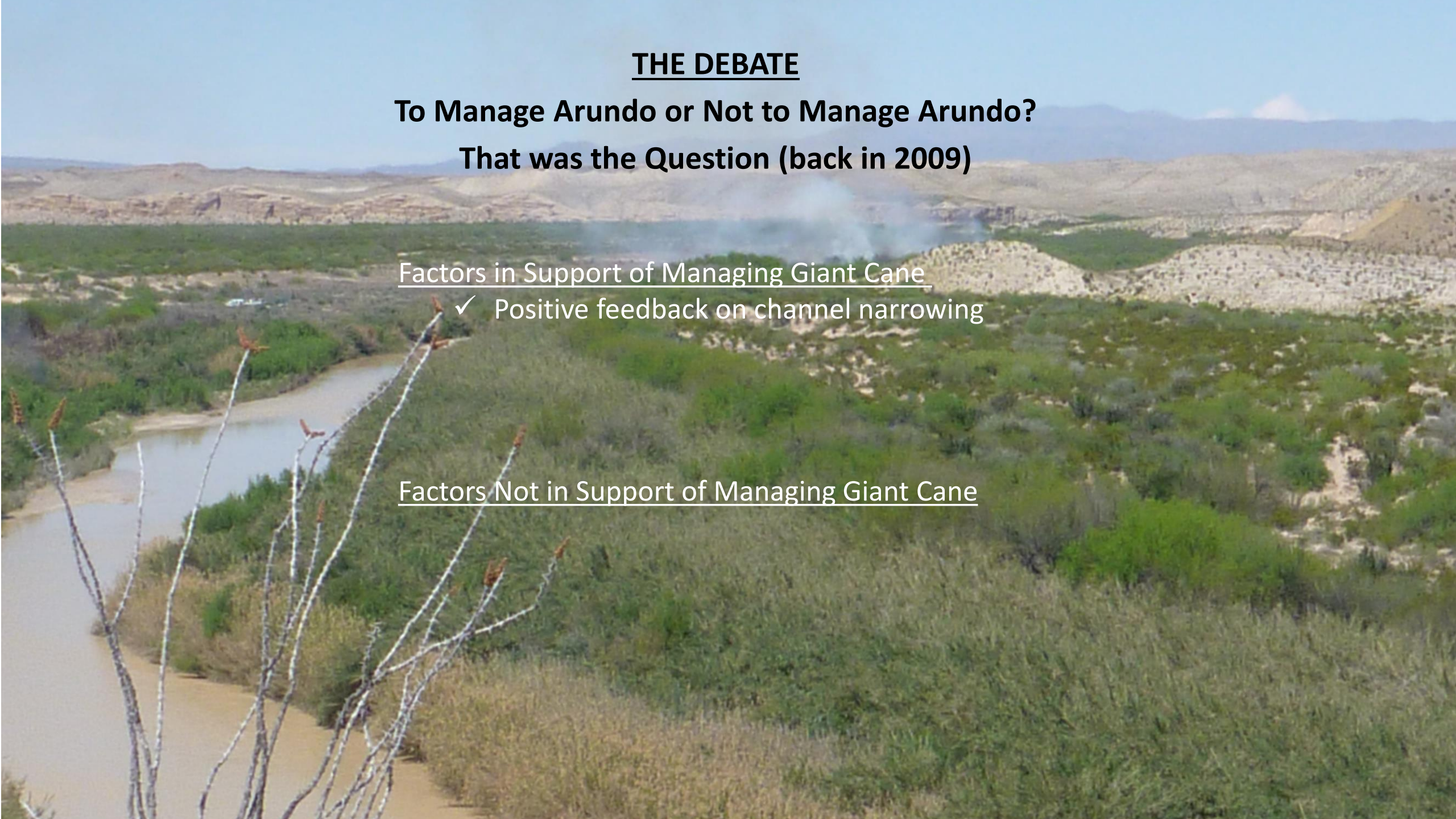
That was the Question (back in 2009)

Factors in Support of Managing Giant Cane

- ✓ Positive feedback on channel narrowing
- ✓ Decline of high quality of riparian hábitat
- ✓ Loss of campsites
- ✓ Decline in aesthetics
- ✓ Loss of river access
- ✓ Support long-term binational visión for RGB

Factors Not in Support of Managing Giant Cane

- ✓ Does not address causes of expansion
- ✓ Rabbit hole of managment
- ✓ Eradiation methods and cost
- ✓ Use of herbicide



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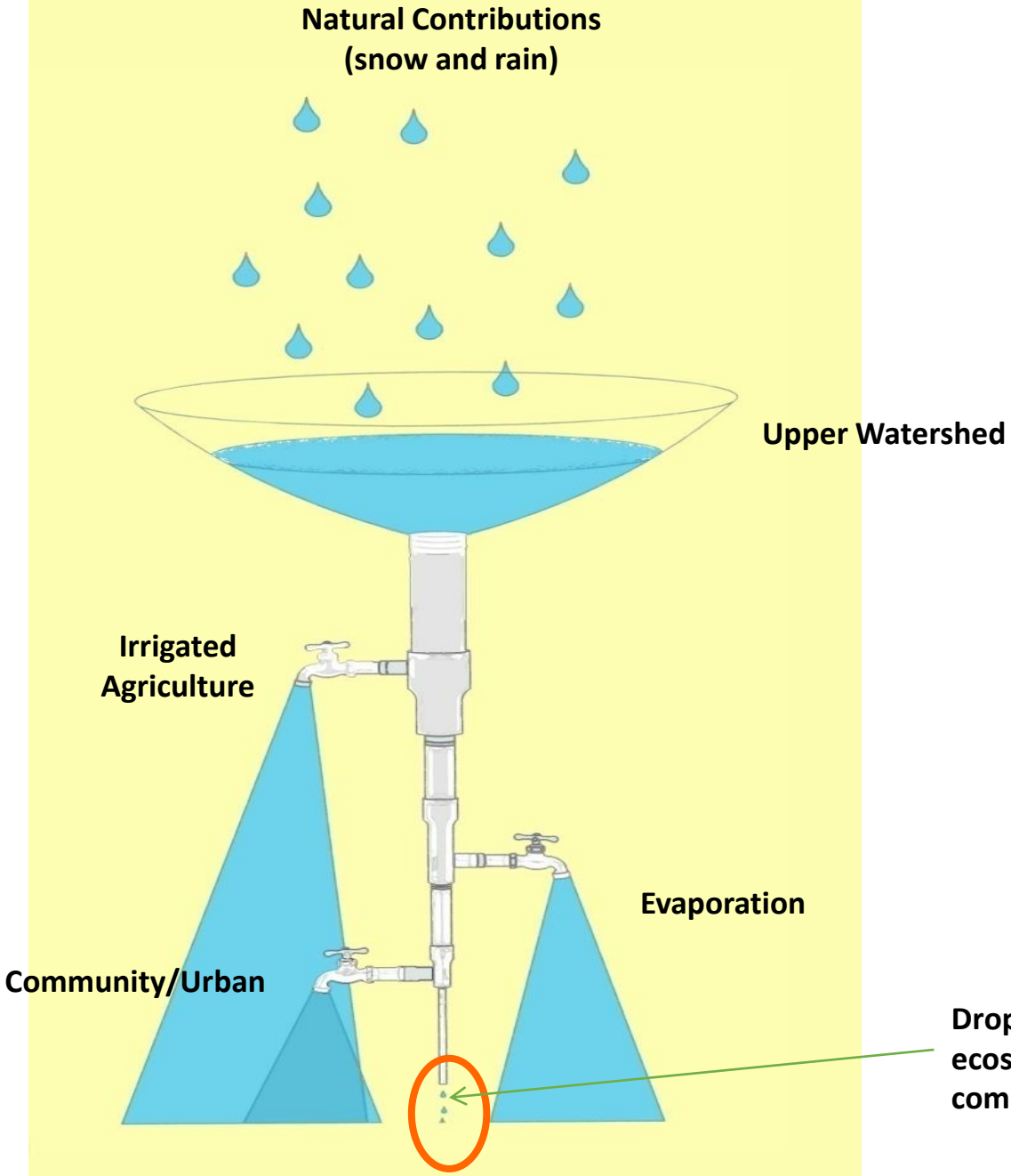
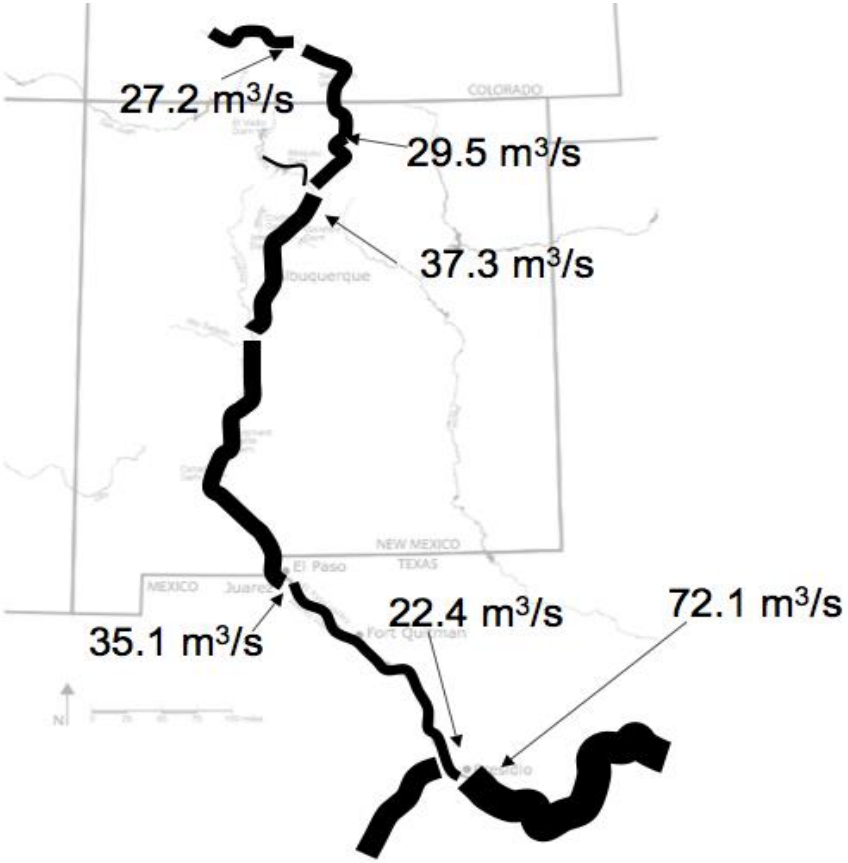
Factors Not in Support of Managing Giant Cane

The hydrology of the Rio Grande/Rio Bravo is fundamentally altered

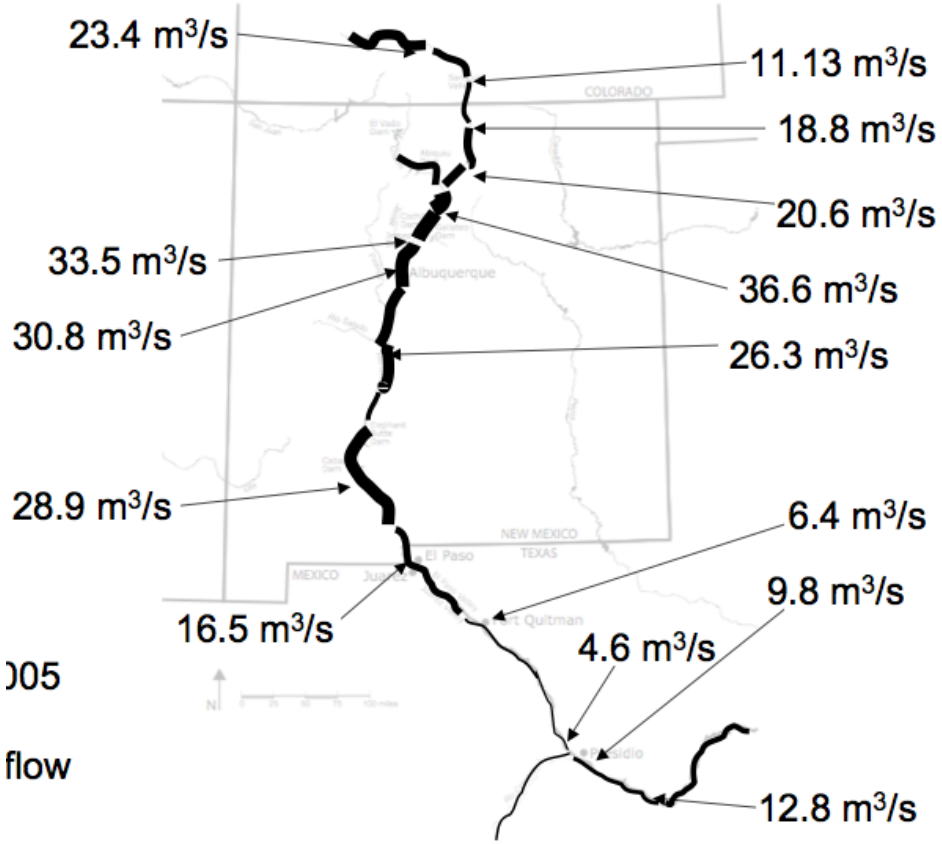


The Rio Grande/Bravo System is Highly Modified

Downstream segments have greatly reduced stream flow with abundant sediment supply



Pre-1915

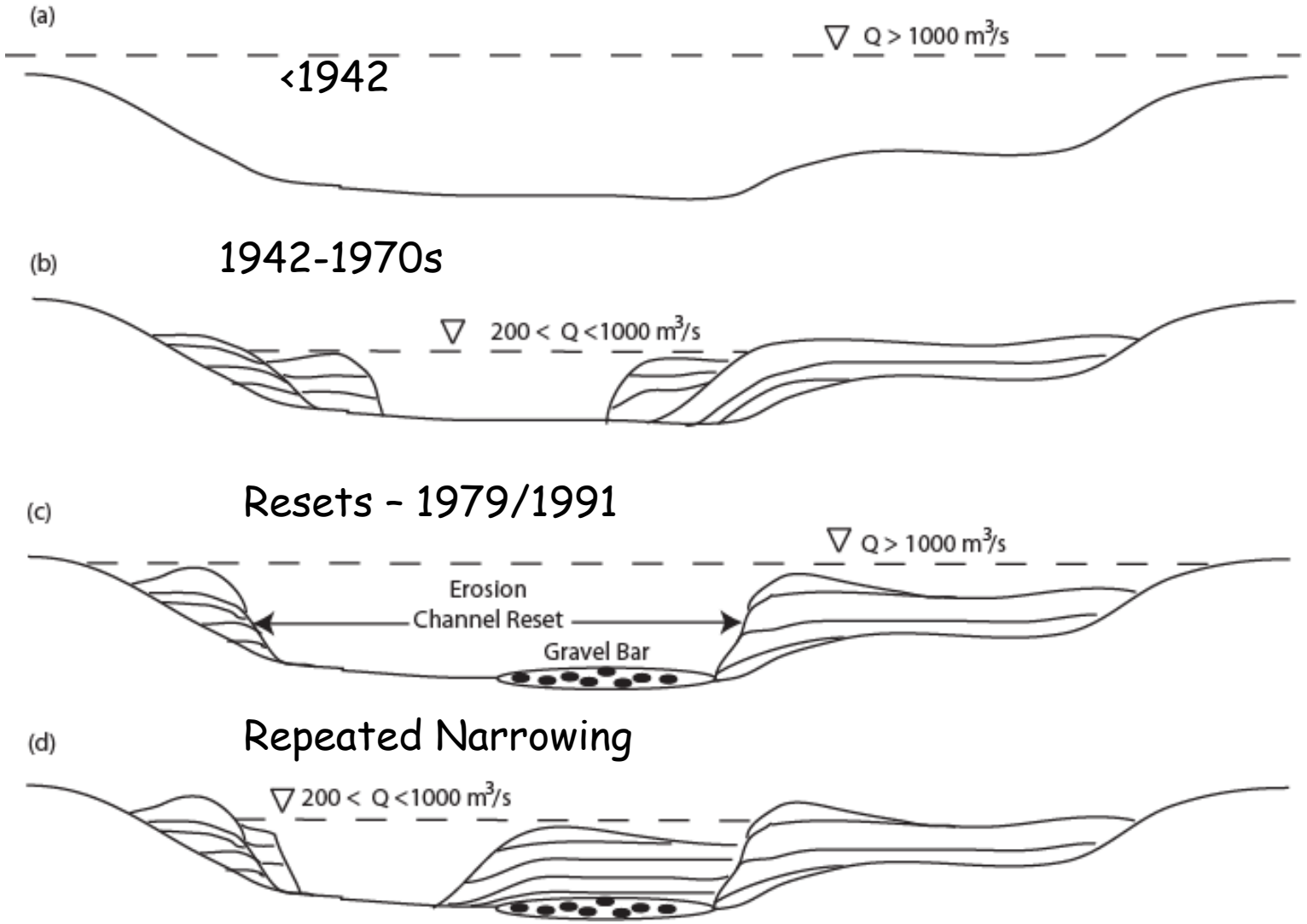


1995-2005

Dean and Schmidt, 2009

RIVERS ARE RIVERS OF WATER AND SEDIMENT

General Geomorphic Model of Channel Change along Rio Grande/Bravo



Wide and shallow channel with large channel capacity

Channel aggradation produces narrow and deep channel

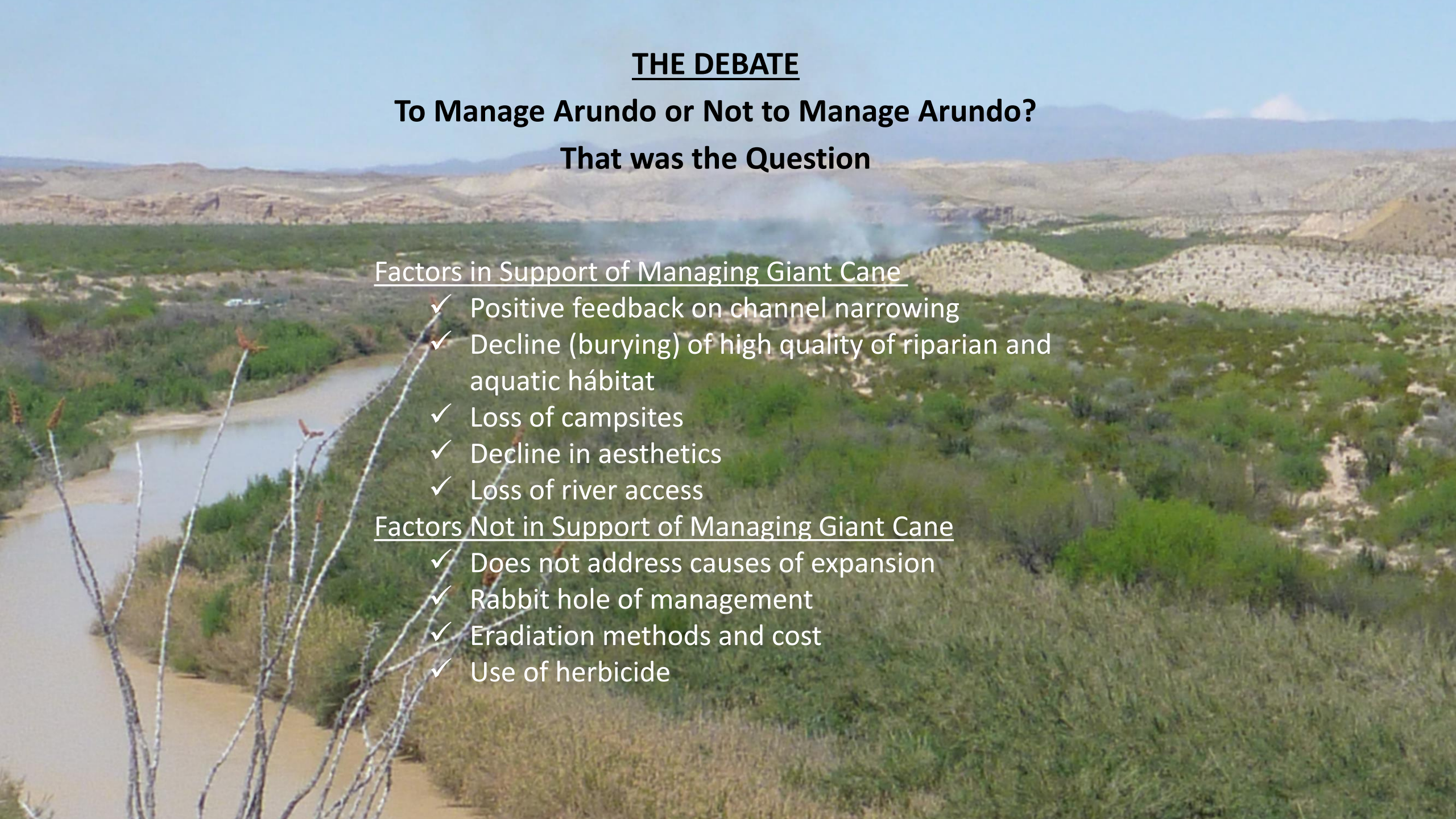
River in Big Bend still experiences flood events that reestablishes wider channel conditions

Establishment of exotic nonnative plants on channel bars promotes further channel narrowing

From David Dean, Utah State University (2010)

Rio Grande/Bravo at Tornillo Creek confluence, Approximately 1936 (Big Bend NP, archive)

Rio Grande/Bravo at Tornillo Creek confluence, 2006 (Big Bend NP, archive)



THE DEBATE

To Manage Arundo or Not to Manage Arundo?

That was the Question

Factors in Support of Managing Giant Cane

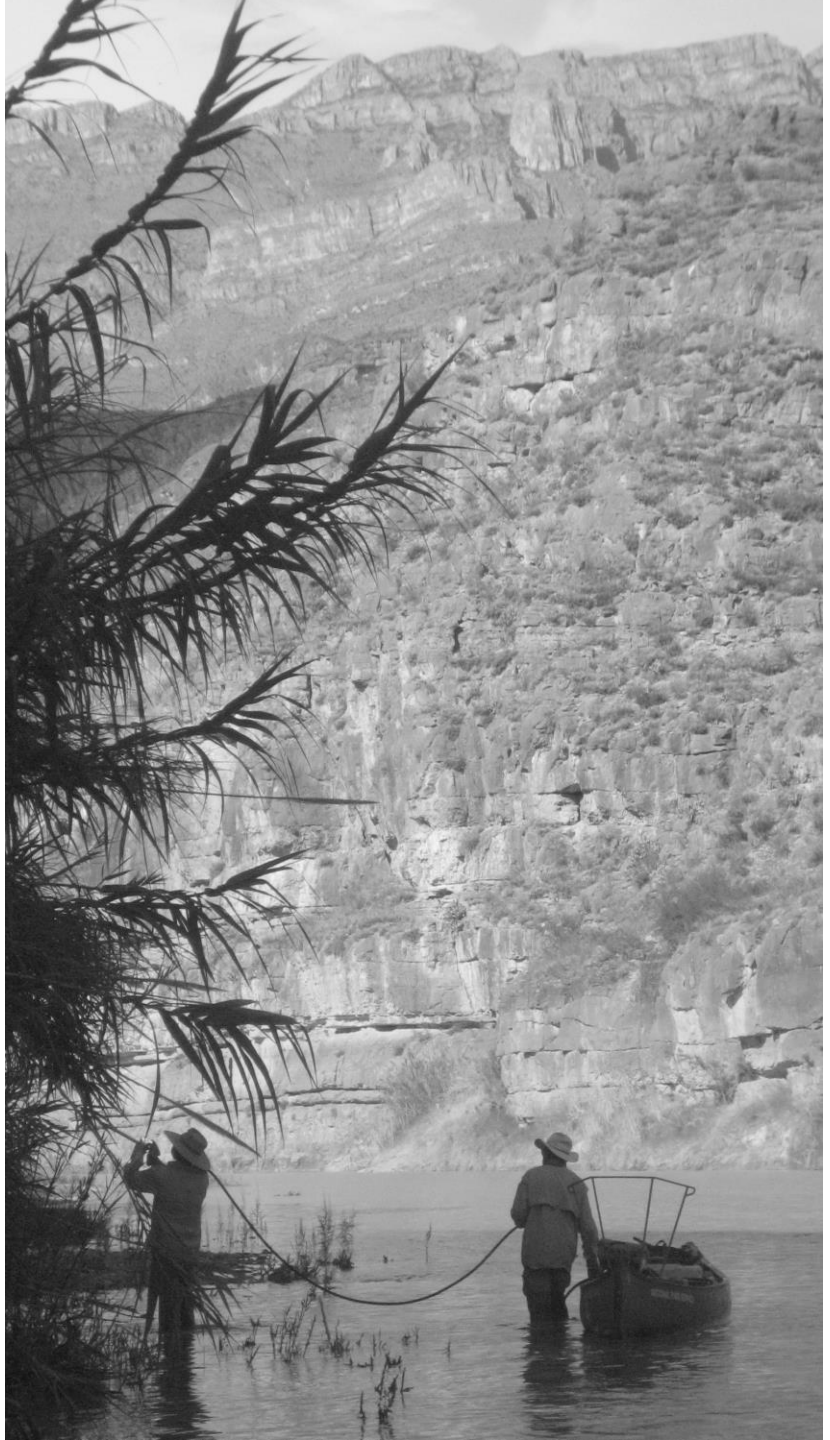
- ✓ Positive feedback on channel narrowing
- ✓ Decline (burying) of high quality of riparian and aquatic hábitat
- ✓ Loss of campsites
- ✓ Decline in aesthetics
- ✓ Loss of river access

Factors Not in Support of Managing Giant Cane

- ✓ Does not address causes of expansion
- ✓ Rabbit hole of management
- ✓ Eradiation methods and cost
- ✓ Use of herbicide


THE DECISION (2010)
Move forward with giant cane management at pilot scale and expand from there


GIANT CANE MANGAGEMENT:
1) PRESCRIBE BURN
2) TREAT RESPROUTS W HERBICIDE
3) RE-TREAT
NATIONAL PARK SERVICE




MONITORING

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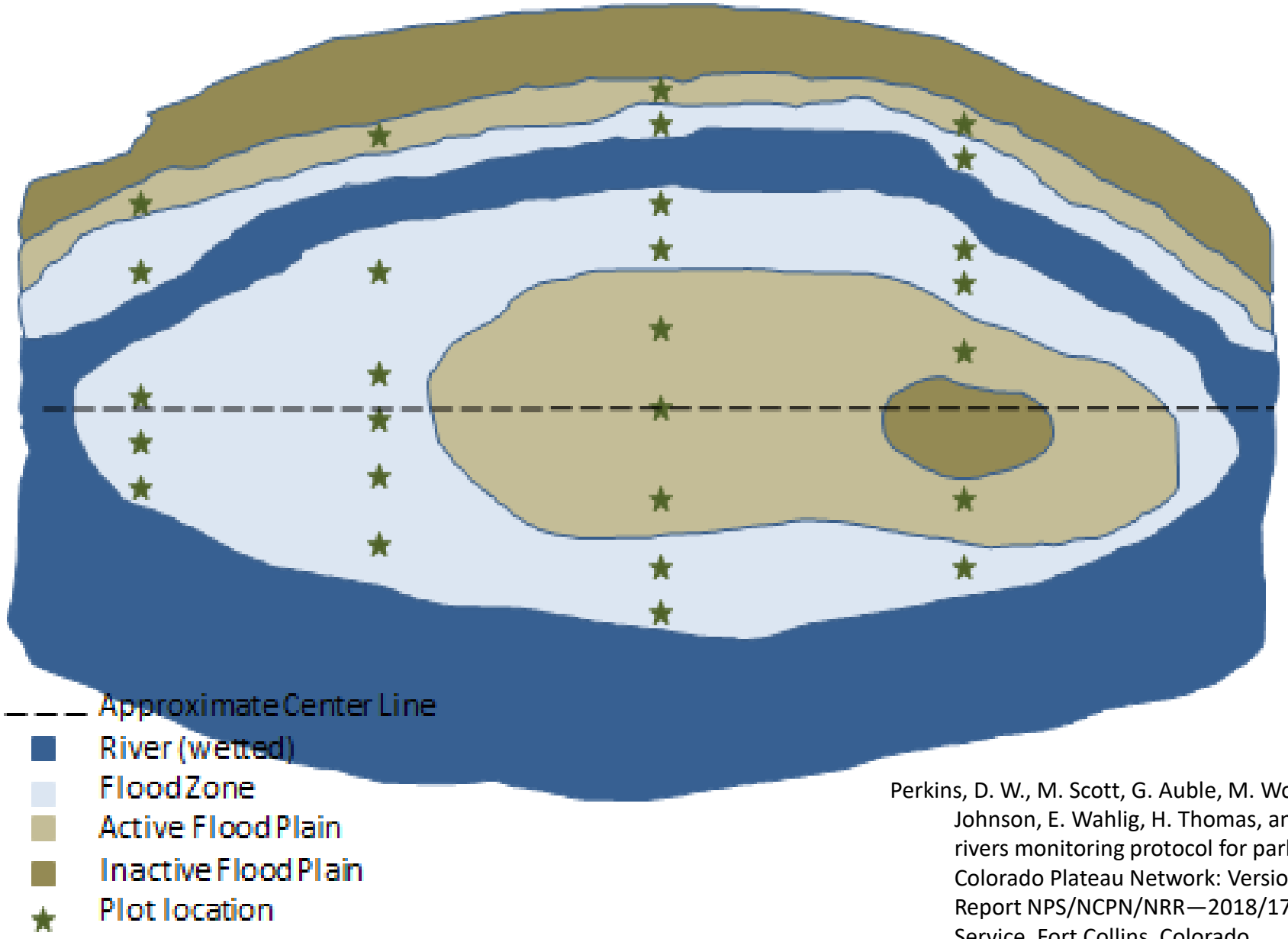
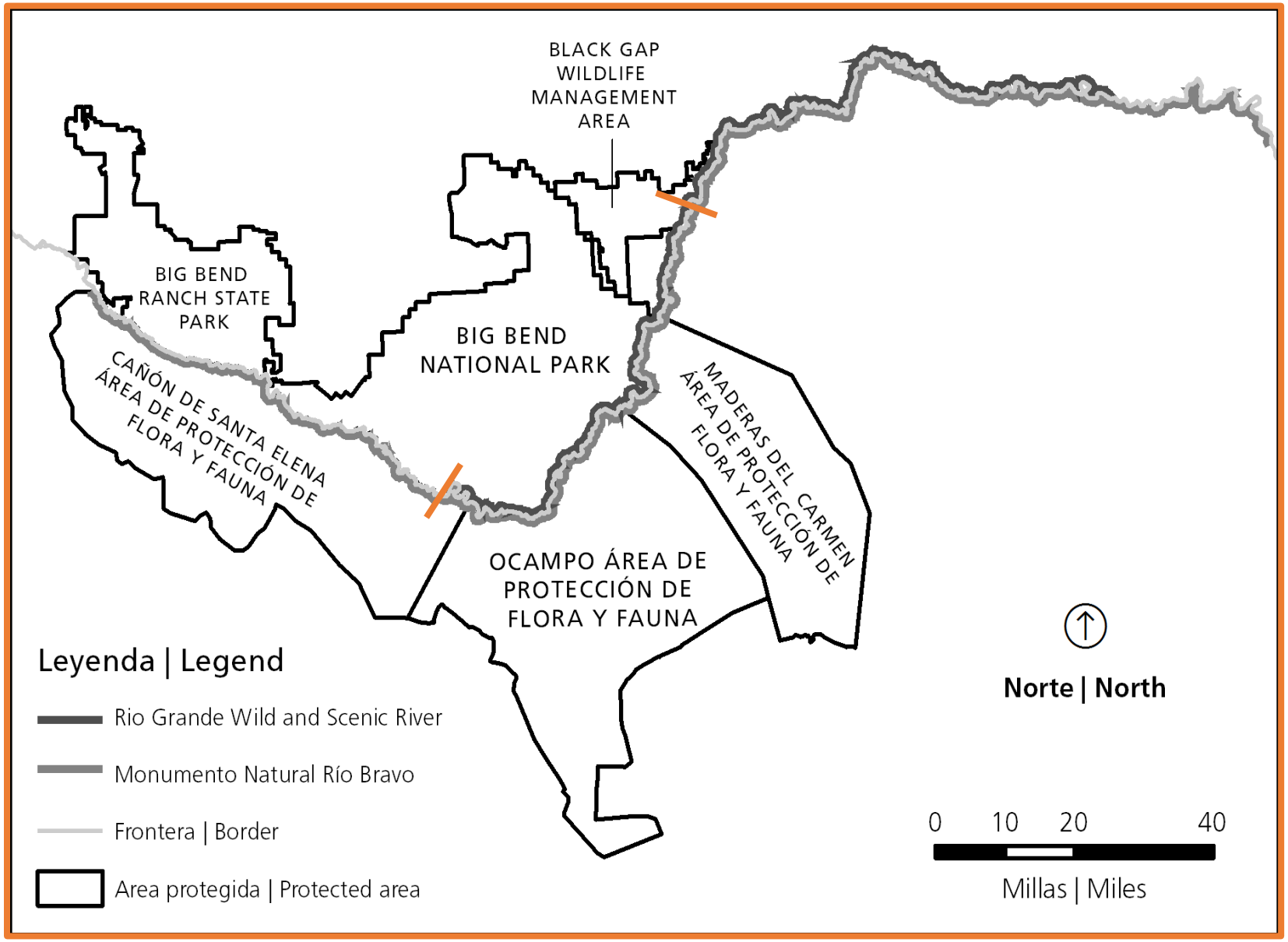


Perkins, D. W., M. Scott, G. Auble, M. Wondzell, C. Holmquist-Johnson, E. Wahlig, H. Thomas, and A. Wight. 2018. Big rivers monitoring protocol for park units in the Northern Colorado Plateau Network: Version 1.01. Natural Resource Report NPS/NCPN/NRR—2018/1707. National Park Service, Fort Collins, Colorado.

RESULTS: 100 Km OVERALL LENGTH OF RIVER TREATED




TREAMENT METHODS ARE EFFECTIVE IN KILLING CANE

COSTS

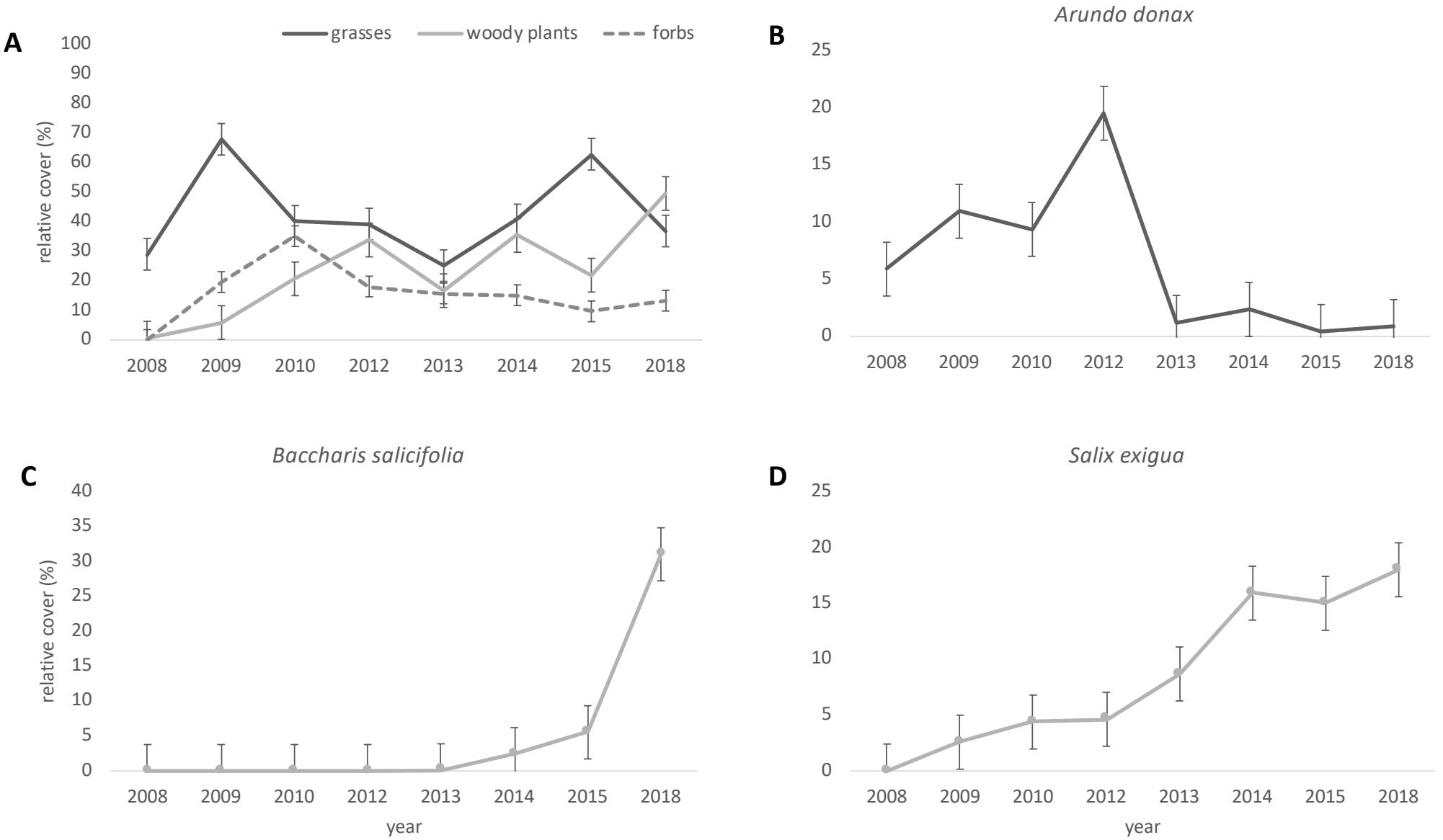
Average Cost: $6,175 and $12,350 per ha (includes prescribe burn and first treatment)

Secondary Treatment: ~ 1/5 cost of primary treatment ($1,235 to $2,470 per ha)

By helicopter: $3,500/ha

Maintenance Costs: ~ $2,000/ha (routine follow-up every 3 to 5 years)

RESULTS: RESPONSE OF RIPARIAN VEGETATION COMMUNITY



CHANNEL MORPHOLOGY (anecdotal)

LOOKING FORWARD

SOME POSITIVE RESULTS

LOOKING FORWARD

SOME POSITIVE RESULTS

- ✓ Desirable riparian vegetation and channel morphology response
- ✓ Management methods prove effective in eradicating cane
- ✓ Eradication methods not prohibitively expensive
- ✓ Maintenance costs are not prohibitive
- ✓ Strong support from local riverside communities and boaters
- ✓ Positive results could be foundation for additional work

SOME IMPORTANT UNKNOWNS AND CAVEATS

WHAT HAPPENS AFTER THE NEXT RESET FLOOD EVENT?

Rio Conchos at Rio Grande/Bravo, Ojinaga, México (September 2008)

Release of the Arundo wasp (*Tetramesa romana*)

Strong Regeneration of Coyote Willow (*Salix exigua*)

THANK YOU

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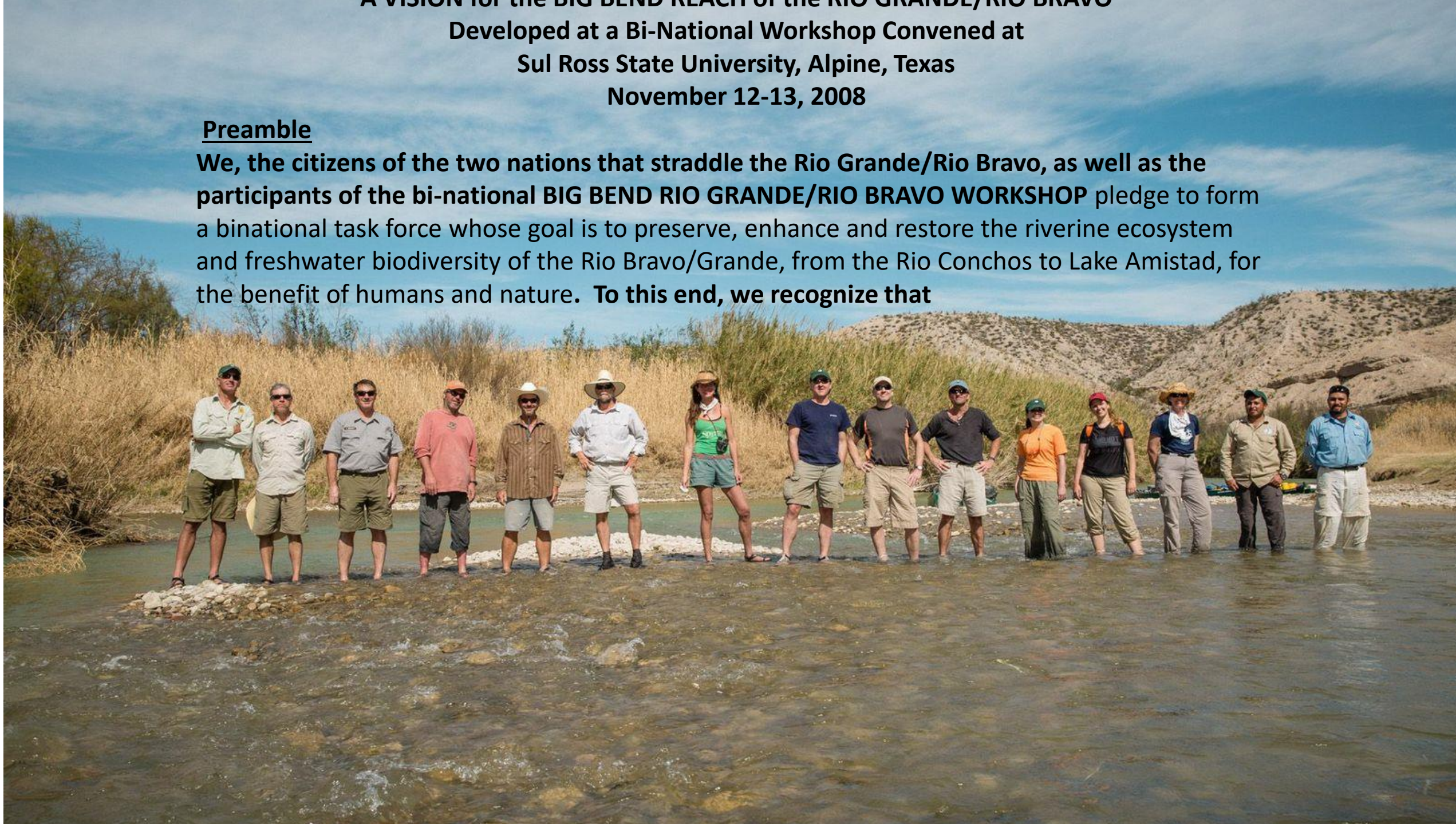
A VISION for the BIG BEND REACH of the RIO GRANDE/RIO BRAVO
Developed at a Bi-National Workshop Convened at
Sul Ross State University, Alpine, Texas
November 12-13, 2008



Preamble

We, the citizens of the two nations that straddle the Rio Grande/Rio Bravo, as well as the participants of the bi-national BIG BEND RIO GRANDE/RIO BRAVO WORKSHOP pledge to form a binational task force whose goal is to preserve, enhance and restore the riverine ecosystem and freshwater biodiversity of the Rio Bravo/Grande, from the Rio Conchos to Lake Amistad, for the benefit of humans and nature**. To this end, we recognize that**

Rio Bravo/Rio Grande Vision

- A river cross-section form that is relatively wide and shallow;
- A diverse patchy and discontinuous riparian plant community where no specific non-native species is dominant;
- An aquatic habitat that will sustain and enhance the distribution and extent of native river biota, including native fish assemblages - including the silvery minnow - aquatic macro-invertebrates and other key components that are indicative of the system`s health and function;