



Transboundary Madrean Watersheds Landscape Conservation Design

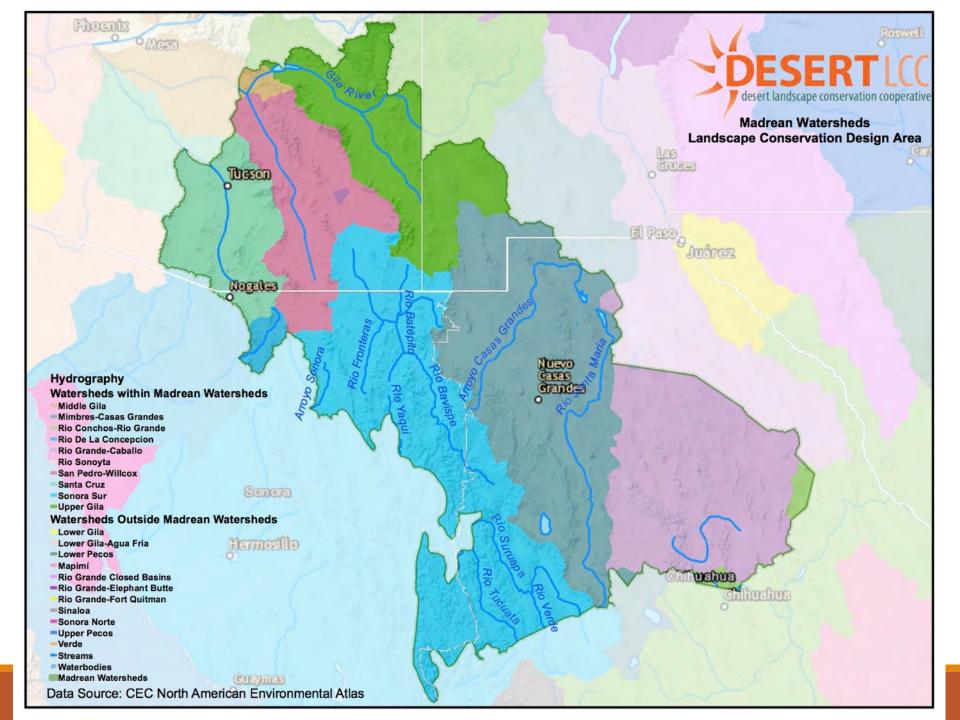
Management Challenges and Actions

June 17, 2019
Matt Grabau and Amanda Webb

Transboundary Madrean Watersheds Vision

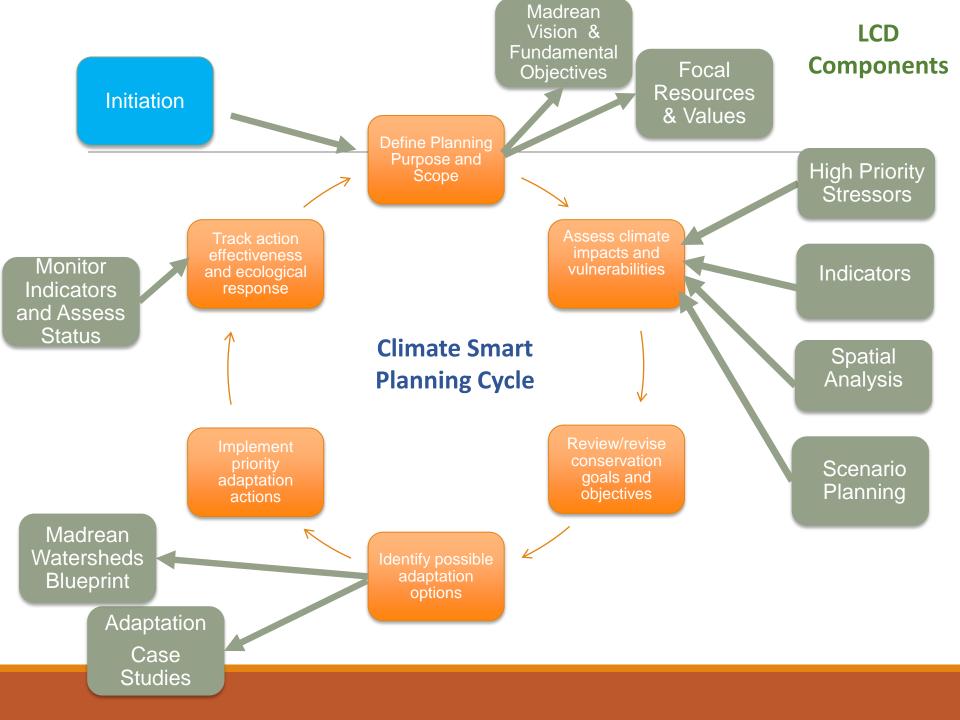
The Madrean Watersheds initiative is a large landscape, international effort to maintain and enhance the interconnected system of mountains, grasslands, deserts, and waters that supports species diversity, promotes healthy watersheds, and maintains the overall ecosystem integrity that enriches the lives of human communities.

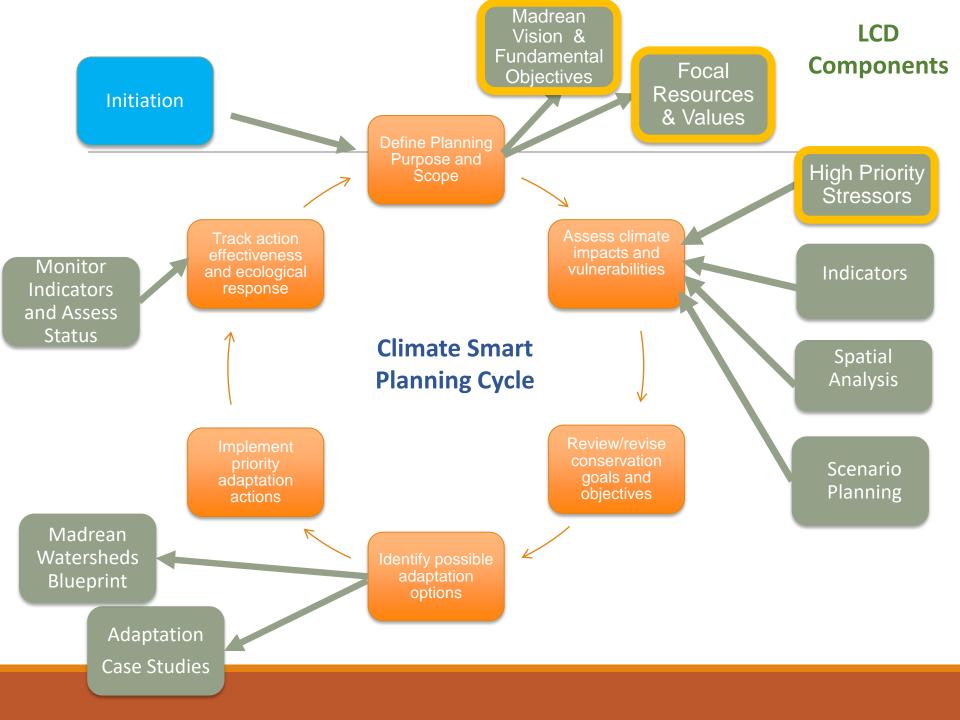




Landscape Conservation (Planning and) Design

- Conservation Planning
 - •The "What" and "How Much"
- Conservation Design
 - •The "Where" and "How"
- Develop Collaborative Partnership
 - •Facilitate long-term implementation and adaptive management





Biodiversity - Transboundary Madrean watersheds are a haven for the unique diversity of native and endemic species.

- Maintain water and riparian systems
- Maintain and enhance native species and habitat
- Maintain populations of priority species



Connectivity - Enhanced linkages connect the diverse life zones of Sky Island ecosystems, from valley bottoms to mountain tops, from southern Sonora to the Gila River in Arizona, enabling persistence of migratory wildlife and allowing for the possible future shift of species and ecosystems in a changing climate.

- Maintain/increase linkages for wildlife
- Maintain connected network of water sources for wildlife
- Increase/restore connectivity of habitat

Socio-Ecological Services - Healthy watersheds and functioning ecosystems deliver highly valued services to human communities and essential benefits to wildlife.

- Optimize watershed benefits for humans, ecosystems, wildlife
- Value ecological services
- Maintain soil function/reduce erosion
- Increase human connection to place
- Support working landscapes for ecological benefit
- Prioritize ecosystem integrity/sustainability

Expert Input Gathered at Workshops

- •What stressors and pressures are having the highest impact on this ecosystem?
- •What management objectives do you have for this ecosystem?
- •How are these high impact stressors and pressures affecting what you are trying to achieve?

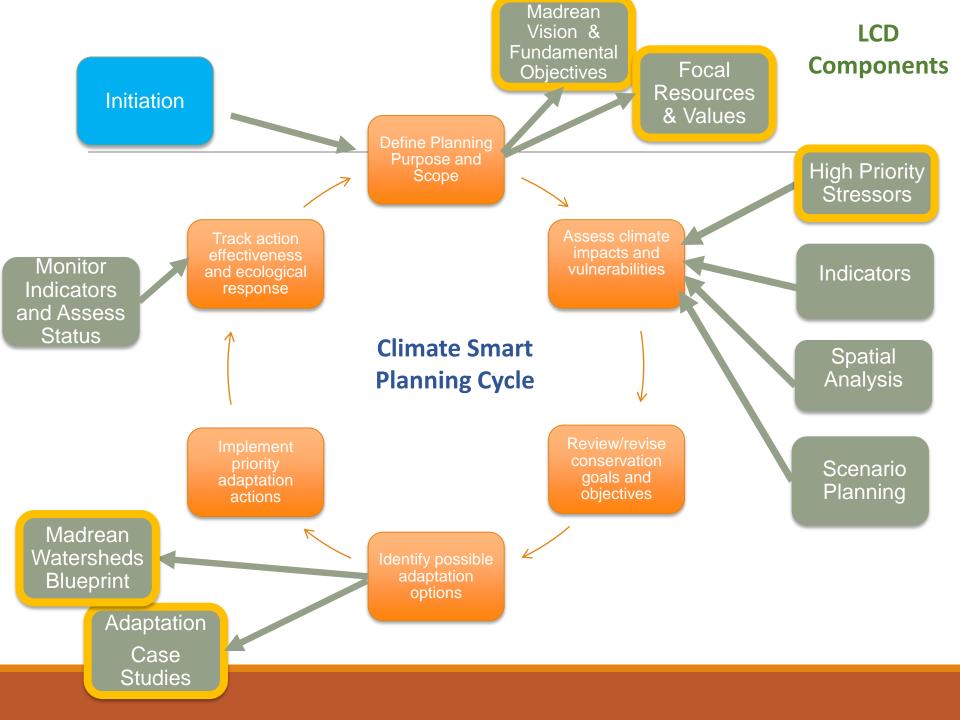


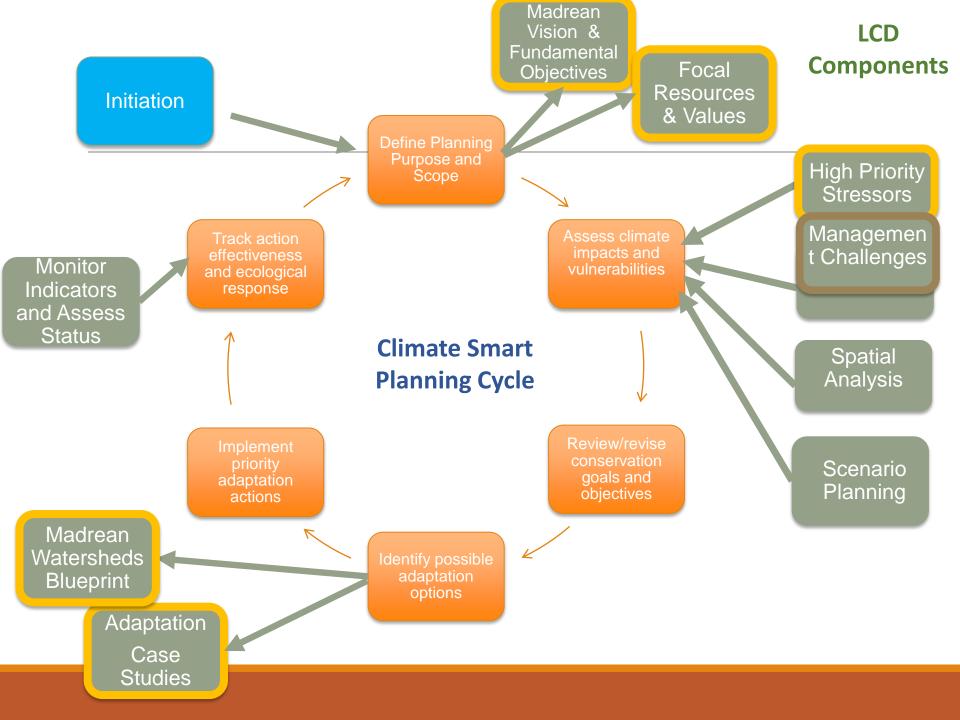
Expert Input Gathered at Workshops

- •What adaptation strategies and actions are you already implementing to reduce vulnerability of these resources? What new adaptation strategies and actions could you or your partners implement?
- •Values: Why do people care about these resources? How are people using these resources?
- •What kind of information would you need to inform management to address this stressor?

Key points from partners

- Develop a framework to prioritize management actions and monitor landscape-scale conditions
 - •Focus on *implementation* rather than simply producing more planning documents
- Strengthen and/or develop ongoing forums and partnerships for coordination and collaboration
- Work for shared leadership and the development of shared funding









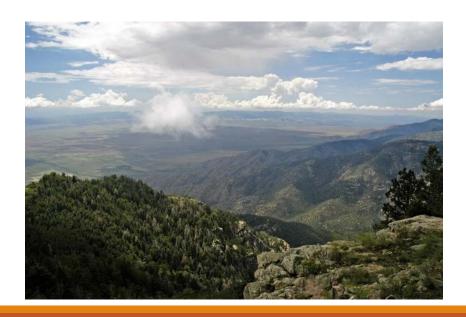
Transboundary Madrean Watersheds Landscape Conservation Design

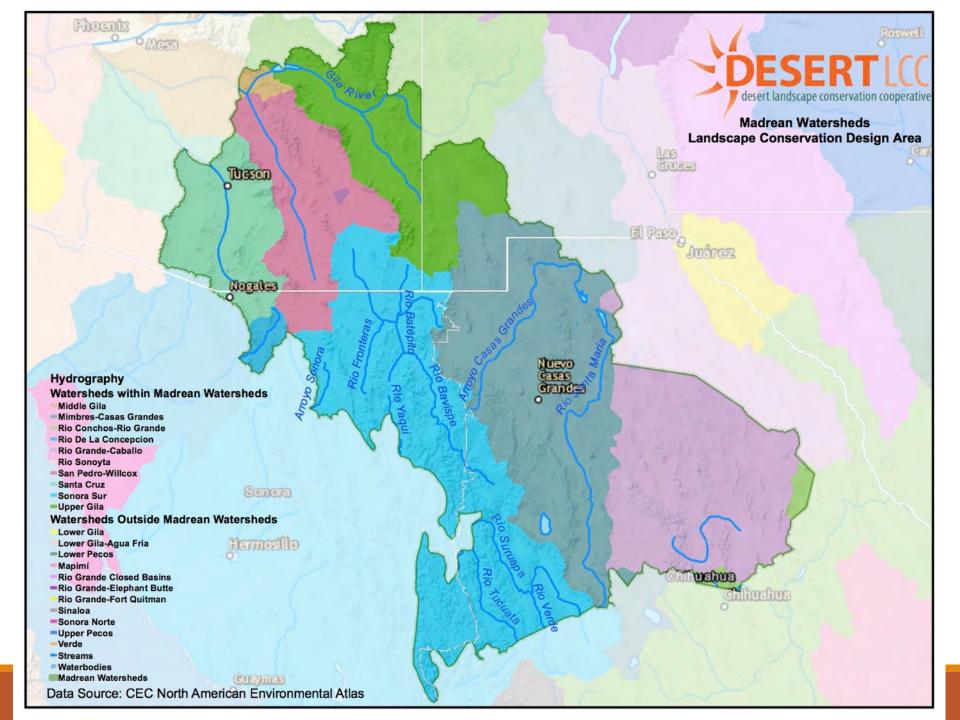
Management Challenges and Actions

June 17, 2019
Matt Grabau and Amanda Webb

Transboundary Madrean Watersheds Vision

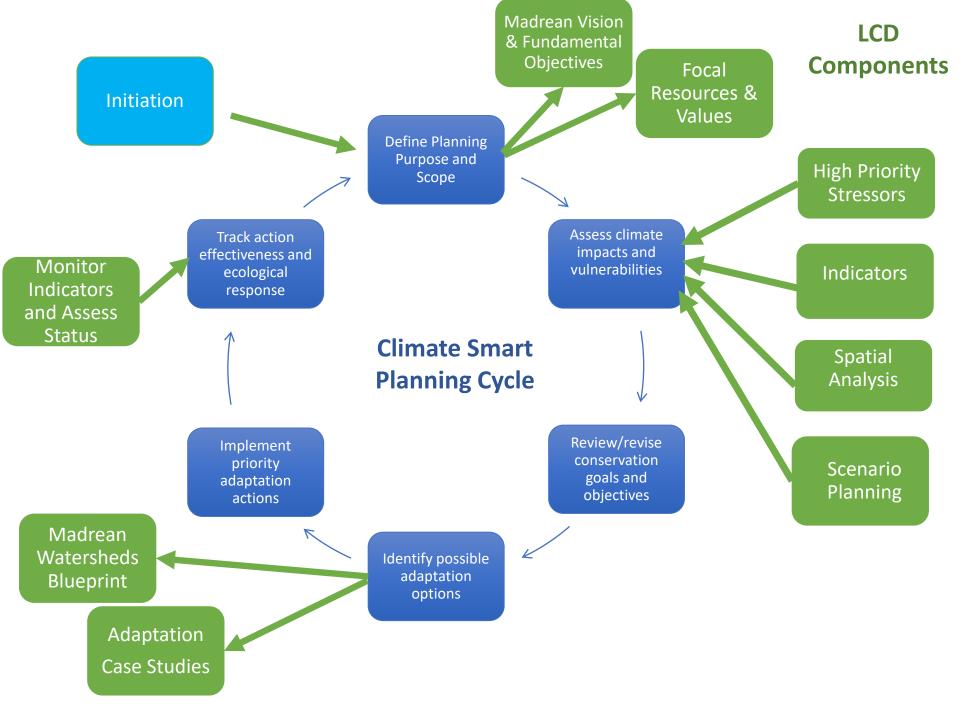
The Madrean Watersheds initiative is a large landscape, international effort to maintain and enhance the interconnected system of mountains, grasslands, deserts, and waters that supports species diversity, promotes healthy watersheds, and maintains the overall ecosystem integrity that enriches the lives of human communities.

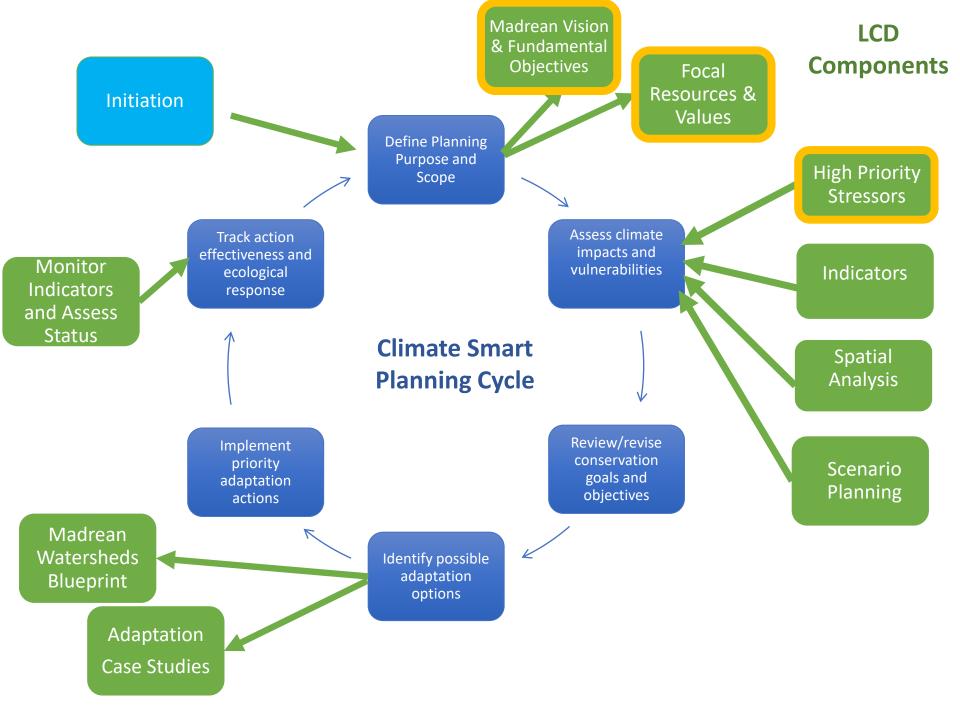




Landscape Conservation (Planning and) Design

- Conservation Planning
 - •The "What" and "How Much"
- Conservation Design
 - •The "Where" and "How"
- Develop Collaborative Partnership
 - Facilitate long-term implementation and adaptive management





Biodiversity - Transboundary Madrean watersheds are a haven for the unique diversity of native and endemic species.

- Maintain water and riparian systems
- Maintain and enhance native species and habitat
- Maintain populations of priority species



Connectivity - Enhanced linkages connect the diverse life zones of Sky Island ecosystems, from valley bottoms to mountain tops, from southern Sonora to the Gila River in Arizona, enabling persistence of migratory wildlife and allowing for the possible future shift of species and ecosystems in a changing climate.

- Maintain/increase linkages for wildlife
- Maintain connected network of water sources for wildlife
- Increase/restore connectivity of habitat

Socio-Ecological Services - Healthy watersheds and functioning ecosystems deliver highly valued services to human communities and essential benefits to wildlife.

- Optimize watershed benefits for humans, ecosystems, wildlife
- Value ecological services
- Maintain soil function/reduce erosion
- Increase human connection to place
- Support working landscapes for ecological benefit
- Prioritize ecosystem integrity/sustainability

Expert Input Gathered at Workshops

- •What stressors and pressures are having the highest impact on this ecosystem?
- •What management objectives do you have for this ecosystem?
- •How are these high impact stressors and pressures affecting what you are trying to achieve?

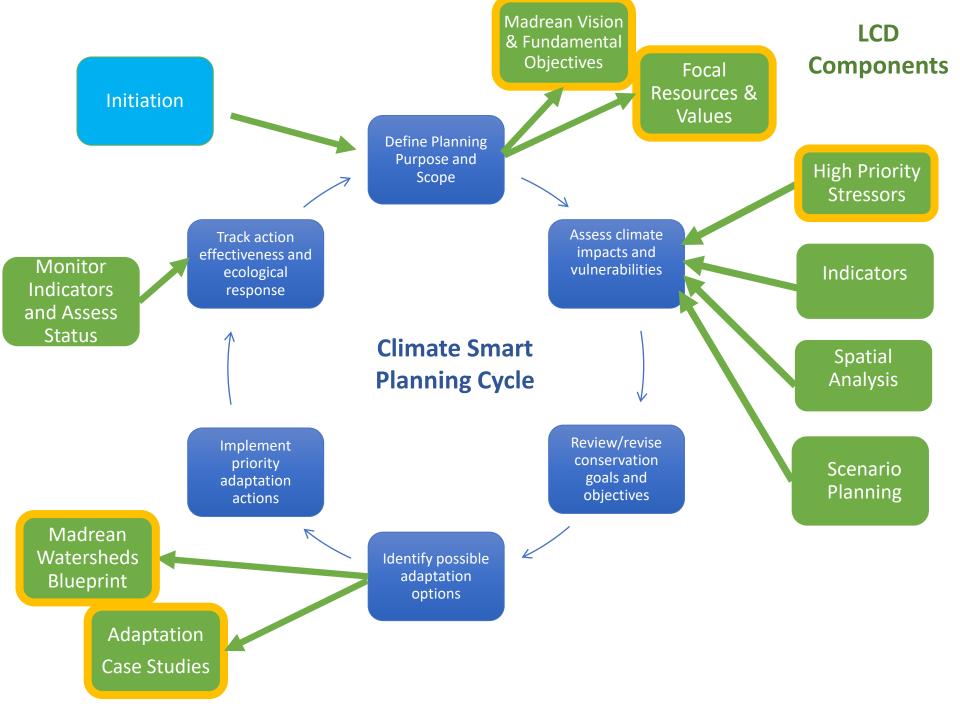


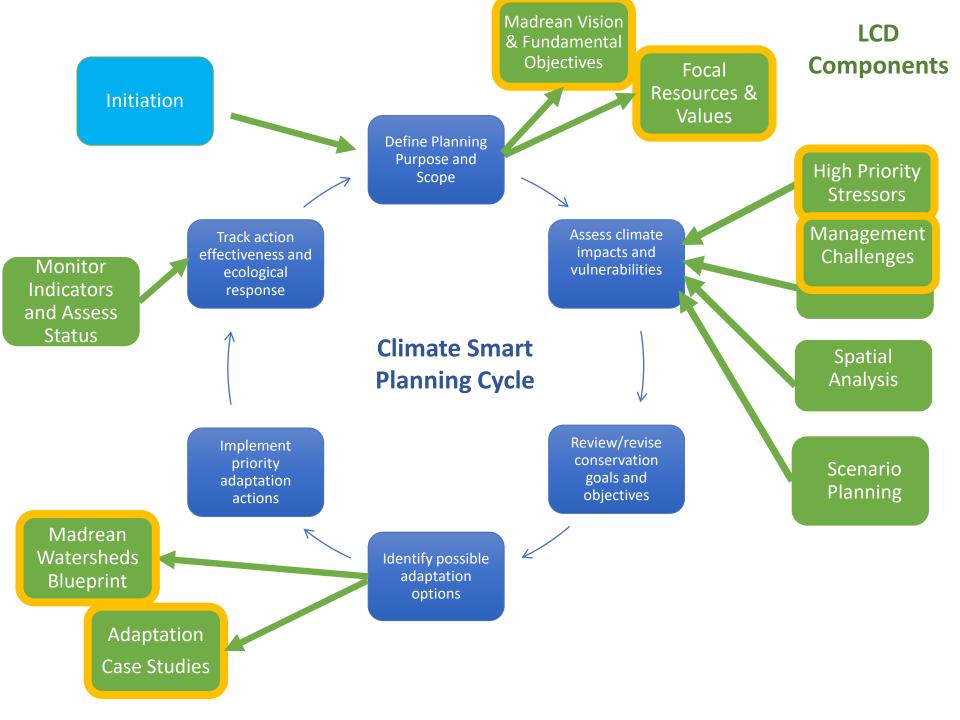
Expert Input Gathered at Workshops

- •What adaptation strategies and actions are you already implementing to reduce vulnerability of these resources? What new adaptation strategies and actions could you or your partners implement?
- •Values: Why do people care about these resources? How are people using these resources?
- •What kind of information would you need to inform management to address this stressor?

Key points from partners

- Develop a framework to prioritize management actions and monitor landscape-scale conditions
 - •Focus on *implementation* rather than simply producing more planning documents
- Strengthen and/or develop ongoing forums and partnerships for coordination and collaboration
- Work for shared leadership and the development of shared funding





Current Product

- A catalog of adaptation actions linked to relevant case studies from CCAST (Collaborative Conservation Adaptation Strategy Toolbox)
- Based on partner input from the last 4 years
- Spreadsheet / Google sheet format

J	(0																																		
	64		• 11	1	44	0	M	-5	1	U.	V	W	78	Y	z	AA.	48 4	c 1	D AE	10	A0:	Apri	Al.	A.	AK .	AL A	M 7	N A	Q AF	80	88	AS	At	AU	AV	AW
1	_		Type	of Acti	ion	LC	D Go	blld	1	_		_		Ma	nagem	ent Ch	allenges		-		-	-	Appro	ches to	Mana	gement	Challe	oges (Categor	n .	-	-	Ecos	ystem A	Applica	bility
2.	Jan.		- Andrews	Respect Stranger	Sport of the state	Pool of Con	Comper of the	September 1	Albany Company	Menor Connes	Appendix of the same of the sa	Grand and a series	Special Property of the Party o	The same of the sa	September 1	Series Parent	The state of the s	The state of the s	San	To a land of the l	Some of the state	Sales of the Control of the Sales of the Sal	A CONTRACTOR OF THE PARTY OF TH	12	- Common	Samuel Control	Common of the Control	1	No. of Section 1989	Gran Control	Parce Constant		John John Marie Land	· / /	o Jones	1
1	3	Acquire accurate geolocations for springs.	0	,	0	1	1	1	,	0	1	4	,	4	1	1	1	,	,	,	1	0	0	,	0	0	0) (0 0	1	0	0	1	0	0	0
2	119	Acquire spatially explicit data on distribution of species and habitats.	0	1	0	1	1	0			200		~										0	1	0	0	0	, (0	1	0	0	0	1	1	0
9	18	Acquire water rights for the environment and wildlife. Establish ownership	-1	0	0	1	1	1	1	1	1	1	:1	1	1	1	0 (0	1	1	0	1	0	0	1	0	1		1	0	0	0	1		1	0
	400	Acquire water rights for the environment and widdle. Establish ownership.	4	ė	0	4	0	θ															e	0	e	0	+		+ 4	÷	0	0	4	0	0	0
2	597	Adjudicate surface water rights in the Gila River watershed.	1	0	0	1	1	1															0	0	0	0	0		0	0	0	0	0	1	0	0
8	344	Advocate for water harvesting techniques inserted into Resource Management Plan reviews.	1	0	0	0	1	-1															0	0	0	1: 0	10 8		1	1	0	0	0	4	0	0
i,	311	After Conservation Bluepring 1.0, move forward together on a landscape scale and connect to watershed collaboratives in the area. Hold a meeting with watershed leaders, the Madrean Core Team and others.	1	0	8	0	0	1	0	0	0	0	0	0	0	0	0	0	0 0	0	1	0	0	0	1	0	0	,	0 0	1	0	0	0	0	0	0
10	100	Align similar efforts to reduce redundancy	5	0	0	0	0	11	1	1	10	1	1	1	1	1	1	,	1 1	1	1	-1-	0	0	1	1	0	,	0 0	1	0	0	0	1	0	0
11	288	Analyze trends in conditions at springs.	0	31	0	1	1	1															.1	0	0	0	0	,	0	0	0	0	1	0	0	0
12	138	Apply pre-emergent herbicide along roads in shrublands.	1	0	0	1	9	1	4	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0		1	0	0	0	0	0	0	1
13	178	Apply the cross-jurisdictional biological planning process for adaptive management of rangelands used at Las Cienegas NCA to other watersheds where appropriate.	.9	0	0	0	0	1	1	1	1	1	1	1	1	1	1	,	, ,	1	1	1	1	0	1	1	0	0	0	1	1	0	0	0	0	0
14	36	Apply the results of groundwater models to water resource management to maintain spring ecosystem function	1	0	0	1	1	1	0	1	1	1	9	1	0	1	0	0	1 0	0	0	0	4	0	1	0	18	, (0 0	0	0	0	1	0	0	0
13	527	Are there any ongoing projects that preserve environmental flows and take into account climate change?	0	1	0	1	1	0															1	0	0	0	0		0	0	0	0	0	1	1	0

Where Did The Actions Come From?

- Climate Smart Landscape Conservation Planning and Design Workshop Summary
 - August 2015
- Madrean Watersheds Conservation Design Workshop
 - September 2016
- Madrean Watersheds LCD Indicators Workshop
 - November 2017
- Madrean Conference LCD Session
 - May 2018
- Coordinating Team Meeting Notes
 - Ongoing

Adaptation Actions are Categorized By:

Type of Action **LCD** Goals Management Challenges Approach to Management Challenges **Ecosystem of Interest** Source Photo: Valer Clark, Cuenca los Ojos

Categories: Type of Action and LCD Goals

Type of Action

Management strategy ~ 200

Monitoring need ~ 25

Research need ~ 200

Total ~ 425

LCD Goals

Biodiversity

Connectivity

Socio-ecology/economics



Photo: Caleb Weaver, Borderlands Earth Care Youth Institute

Category: Management Challenges

Altered fire regimes

Altered streamflow

Altered springflow

Decreasing water availability

Groundwater pumping

Temperature extremes

Invasive species

Habitat loss and fragmentation

Grazing pressures

Erosion and altered geomorphology

Worsening water quality

Uncoupling of phenological relationships

Changes in community composition

Coordination, collaboration, and communication

Impacts on culture, wellbeing, and livelihoods



Photo: Dan Quintana, BLM



Category: Approaches to Management Challenges

Analysis

Data

Collaboration

Communication

Conservation

Policy

Protection

Restoration



Photo: Carianne Campbell, Sky Island Alliance

Category: Ecosystem of Interest

General or cross-cutting

Farms

Ranches

Springs

Streams

Riparian

Desertscrub

Grassland

Madrean woodlands

Montane forests



Category: Source

LCPD_Workshop_Summary.docx (August 4-6, 2015) Madrean 2016 Notes - Day 2 - Strategies.docx High Priority Management Questions - Madrean Workshop 2016 Participants (1).xlsx Madrean Conference - LCD Connectivity Session (5.17.18) Madrean Conference - Connectivity Session Notes MadCon-LCD Moving forward afternoon discussion (5.17.18) Madrean LCD Scenario Planning Meeting (3.2.18) DLCCMadreanWatersheds-2016WorkshopReportFINAL.pdf Madrean CT Agendas and Notes.docx Madrean LCD Indicators Workshop- Nov 2017 - Draft Notes September 2016 Workshop Action Items Summary Madrean 2016 Notes - Day 1 - Goals and Fundamental Objectives.docx Madrean 2016 Notes - Day 1 - Additional Focal Resources .docx

In Addition to Categorization:

- Actions are linked to case studies that show how others have carried out similar actions
 - Within and outside Madrean LCD geography
- Source document is provided
 - Title, name of file, link
- Actions for which potential partners were identified in the source document are flagged

Examples: Management Strategies/Actions

- Conduct workshops on water harvesting for recharge in upper watersheds.
- Create a framework to implement large, landscape-scale fires.
- Create or restore bird habitat in urban areas.
- Match willing landowners in strategic locations for recharge and slowing run-off with mitigation funds as they become available.

Acknowledgement of Case Study Authors

Ashlee Simpson, NAU (formerly UA)

Deanna Morrell, BOR

Matt Grabau, FWS

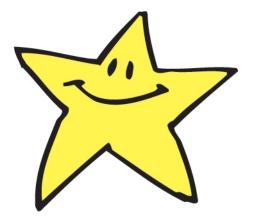
Amanda Webb, SIA (formerly UA)

Andrea Lopez, UNM

Briana Becerra, UNM

Rae Robinson, XWN

Philip Boyd, Sul Ross University



Tour of the Catalog

https://docs.google.com/spreadsheets/d/1mc31 H2ThyQ0UEtKM1LPHtXm0yx-MswHY9kNOomlPaec/edit?usp=sharing

Options for Further Development

No change

- Perhaps this is sufficient for your use or you think you won't use it much
- PDF Tables
- Filter views in Google Drive
- Use an app to create an interactive viewer

Options for Further Development

- No change
- PDF Tables
 - Not automatically updated or interactive
 - Greatly reduces the amount of content which may improve readability
 - Straight forward
- Filter views in Google sheets
- Use an app to create an interactive viewer

A Series of PDF Tables Focused on Topics

.			/	/	/ .		/	/	/	/	/	/	/	/	/	/ / /	/	/—
Challenges Only		,	/ ,	/ ,	/ilide/	/		lien,	/ /	/ so /	Source	/ ,	/ /	/ ,	000			
Adaptation Actions Riparian Areas Specific	Thos.	Atte.	Dec. Springs	Ground Water	W. C. P. P. C. P. P. C. P. C. P.	Sening Walnus Habita	In Section 1988	Phe Specie	A Harman	Eros, Commun.	Sale de la constante de la con	Coord Passure	Cutt. Micetic	After Health, 1	Tem. Reg.	Case Study W	Few/Cas	se Studies
Protect riparian ecosystems and floodplains.	AS		DW			HL			AC	ER	GP					Moiave Desert Native Plant Program	Helping Pollinators Adapt to Climate Change	Gila River Watershed Partnership: Restoration to Mitigate Tamarisk Beetle Impacts
Keep off-road vehicles out of riparian areas.					WQ		IS			ER						Gila River, Watershed Partnership: Restoration to Mitigate Tamarisk Beetle Impacts	Mojave Desert Native Plant Program	Oolores River Restoration Partnership: A Public- Private Collaborative for Riparian Restoration
Work with irrigation districts (United States) and ditch associations (Mexico) to optimize water availability for the environment.	AS		DW	GP		HL						СС				Gila River Watershed Partnership: Restoration to Mitigate Tamarisk Beetle Impacts	Mojave Desert Native Plant Program	Dolores River Restoration Partnership: A Public- Private Collaborative for Riparian Restoration
Keep cattle out of riparian areas.			х		x	x	x		x	x	x					Gila River, Watershed, Partnership: Restoration to Mitigate Tamarisk Beetle Impacts	Moiave Desert Native Plant Program	Dolores River Restoration Partnership: A Public- Private Collaborative for Riparian Restoration
Protect important bird areas and habitat for key species.		x						х						x	х	Mojave Desert Native Plant Program	Dolores River Restoration Partnership: A Public Private Collaborative for Riparian Restoration	Gila River Watershed Parthership: Restoration to Mitigate Tamarisk Beetle Impacts
Maintain natural flows that support native species.																		
Protect riparian ecosystems and floodplains.																		

Options for Further Development

- No change
- PDF Tables
- Filter views in Google sheets
 - Automatically updates when edits made to sheet
 - Can be use to share more information than PDF tables but less than the full Google sheet
 - Not interactive but the underlying Google sheet is (example)
- Use an app to create an interactive viewer

Options for Further Development

- No change
- PDF Tables
- Filter views in Google sheets
- Use an app to create an interactive viewer
 - Could be updated automatically
 - Filter specific information out from a larger body of information
 - Example using Awesome Table:
 - https://awesome-table.com/-Lh2FoE8T3rCXehlx0nJ/view

Back to Matt

Work with partners to determine how LCD products can be most effectively presented/utilized

Inform how conservation actions should be prioritized



Determine how we best work together to achieve the Transboundary Madrean Conservation vision

 Where to next without the Desert Landscape Conservation Collaborative?



Place-based work in specific watersheds helps ensure the LCD is grounded in issues and priorities on the ground.

- a) The Lower San Pedro watershed (AZ)
- b) Tucson Basin / Santa Cruz River Watershed (AZ)



Putting the LCD into Action

Implementation and Monitoring

- Identify opportunities for partners to implement management strategies across the landscape
- Use the established spatial analysis and indicator framework to monitor conditions over time
- Revisit the state of the Madrean/indicator status at regional events like the Madrean Conference

SAVE THE DATE: Upcoming Event

Workshop: Tuesday June 25, 8:30 – 5:00 PM, Tucson

- Share new data and tools for and gather feedback on them
- Share tools and build capacity to make decisions together as a collaborative
- Explore what we as a collaborative group can do together to advance landscape conservation in the Madrean Watersheds
- Determine how we are going to make needed decisions as a collaborative group over time

Thank you!.....Questions?

Matt Grabau
US Fish and Wildlife Service
matthew_grabau@fws.gov

Amanda Webb Sky Island Alliance adwebb@email.arizona.edu





Work with partners to determine how LCD products can be most effectively presented/utilized

Inform how conservation actions should be prioritized



Determine how we best work together to achieve the Transboundary Madrean Conservation vision

 Where to next without the Desert Landscape Conservation Cooperative?



Place-based work in specific watersheds helps ensure the LCD is grounded in issues and priorities on the ground.

- a) The Lower San Pedro watershed (AZ)
- b) Tucson Basin / Santa Cruz River Watershed (AZ)



From Planning to Action

Implementation and Monitoring

- Identify opportunities for partners to implement management strategies across the landscape
- Use the established spatial analysis and indicator framework to monitor conditions over time
- Revisit the state of the Madrean/indicator status at regional events like the Madrean Conference

SAVE THE DATE: Upcoming Event

Workshop: Tuesday June 25, 8:30 – 5:00 PM, Tucson

- Share new data and tools for and gather feedback on them
- Share tools and build capacity to make decisions together as a collaborative
- Explore what we as a collaborative group can do together to advance landscape conservation in the Madrean Watersheds
- Determine how we are going to make needed decisions as a collaborative group over time

Thank you!.....Questions?

Matt Grabau
US Fish and Wildlife Service
matthew_grabau@fws.gov

Amanda Webb Sky Island Alliance adwebb@email.arizona.edu



