

State of the Cienega Watershed 2015
February 17, 2015 * 12-5 PM
Tucson Interagency Fire Center (2646 E. Commerce Center Place)

NOTES

Overall goal

Achieve agreement on a common set of cross-jurisdictional indicators and a process to monitor and evaluate the health of the Cienega Watershed and Sonoita Plain over the long term.

Meeting Purpose

1. Review current efforts to identify desired conditions at the watershed scale (BLM, USFS, Pima County)
2. Share how other watersheds are approaching common issues and discuss how these might inform the Cienega watershed approach
3. Identify and seek agreement on a common set of criteria for selecting indicators of watershed health
4. Identify and agree on a initial set of indicators by topic area

Participants

Sharon Biedenbender, CNF
Mead Mier, PAG
Annamarie Schaecher, CWP
Phil Heilman, ARS
Doug Duncan, USFWS
Shela McFarlin, CWP
Ben Lomeli, BLM
Karen Simms, BLM
Mary Darling, Cochise County
Dennis Caldwell, FROG Project
Louise Misztal, SIA
Emilio Carrillo, NRCS
Brian Powell, Pima County
Charlotte Cook, CWP
Annie McGreevy
Mike Carson
Jennifer Martin, Sierra Club
Peter Warren, TNC
Gita Bodner, TNC

Facilitation and Notes:

Tahnee Robertson, SDR
Colleen Whitaker, SDR
Larry Fisher, UA
Juliette Fernandez, USFWS/SDR

Presentations/Lightning Talks

Living River Report - tracking health of the Santa Cruz River (Claire Zugmeyer, SIA)

- Tracking river health along two stretches that are dependent on effluent

- Began process in 2005 with Upper Santa Cruz, and now expanded into Lower Santa Cruz
- 10 indicators for Upper, and 16 for Lower
- Worked with community and experts to identify key indicators
- Next report out in June (available online, or contact Claire for hardcopy)

San Pedro Sustainability Report (*Bruce Gungle, USGS*)

- Sierra Vista Sub-watershed
- Process was initiated by the Defense Authorization Act of 2003 that effectively changed how ESA applied to Ft. Huachuca, and directed USGS to provide an annual accounting of how the Upper San Pedro Partnership was progressing toward the goal of achieving sustainability.
- Indicators are generally focused on water quantity. The indicators used are driven by available data.
- Water budget is a problematic indicator for annual assessment. There is a lot of uncertainty, and it is a single number that can mask spatial variability. But people tend to like it because it is easily understandable.
- Should consider how best to display information so that it is accessible to the general public.

ADWR Water Atlas Vulnerability Assessment (*Kelly Mott Lacroix, WRRRC*)

- Arizona Water Atlas done in mid-2000's.
- Used existing data to try and assess vulnerability.
- Developed a system to assess vulnerability of any given groundwater basin to water shortage. Criteria and metrics were internally and externally vetted with watershed groups, municipalities, etc.
- The work was not completed, and the metrics were never applied. There is a white paper that summarizes the process and the metrics.

BLM AIMS approach – Assessment, Inventory and Monitoring (*Amy Markstein*)

- Integrates local level monitoring up to district, state and national level - A landscape approach
- Approach is outlined in a technical guide and handbook
- Standard, quantitative indicators and measurements for terrestrial and aquatic. These are core indicators, and others are added as needed to assess local goals and objectives
 - Terrestrial core indicators: bare ground, vegetation composition, plans of management concern, nonnative invasive species, height, canopy gaps.
 - Aquatic core indicators are still being developed

USFS Watershed Condition Framework (*Michele Girard*)

- In 2011 UFS developed a systematic standardized way to look at watershed condition across the country. To support coordination and to prioritize watersheds for restoration
- Framework:
 - A - Classify Watershed Condition
 - B – Prioritize watersheds for restoration
 - C – Develop watershed action plans
 - D – Implement integrated projects
 - E - Track accomplishments
 - F - Monitor and verify
- Indicators are weighted, with aquatic biological weighted the most (note: this is where it doesn't work as well at local level, particularly for SW systems).
- There is an end rating - functioning properly, functioning at risk, impaired function. (Note: this is

not as useful as understanding *why* it is ranked as it is; what are the underlying factors?)

- There aren't as many quantitative measurements as other programs, such as the BLM's.
- Prescott has taken this and added some indicators (particularly around social aspects)
- Sky Islands Restoration Cooperative (USGS, FS, BLM, SIA, Borderlands Restoration Initiative)
 - Small informal group, trying to work together to prioritize watersheds for restoration and identify partnerships
 - [Annual report](#)

Collaborative Forest Landscape Restoration projects – common indicators (*Larry Fisher*)

- Grew out of work in NM. Designed to restore forests in poor health, and to grow local economies.
- In 2010 USFS selected 10 projects. In 2011 they selected an additional 10. \$40 million annual allocation. Projects are a minimum of 50,000 acres.
- The act called for multi-party monitoring. The National Forest Foundation convened a workshop to develop common indicators and monitoring and evaluation protocols.
- Was intended to be “simple and affordable;” allow local areas to use their own locally relevant indicators, but provide a way to scale-up, and draw conclusions at national level.
- Indicator categories: Ecological, fire costs, jobs/economics, leveraged funds, collaboration

Group conclusions/discussions:

- Seems like it needs to get more site specific. Agencies may have a national perspective, or focus on more eastern landscapes.
- Consider using ecosystem services as a way of including social aspect
- If the goal is to have a public document, we need to consider how these will be received/understood
- Don't forget subsurface – groundwater
- Interesting that all these efforts tried to make the best use of existing data. We do often have more data “sitting around” than we actually do something with. Given limited resources, its good to start with what we already have.
- How do we communicate this visually? Could consider using a “Star Chart” approach (this looks at what you want to minimize and maximize in a system)
- The goal is to communicate the state of health, and to educate and encourage action. So we do want something that is visually engaging and creative

What we've done so far

Review threats - from State of the Cienega Watershed 2010 (*Shela, Trevor*)

- Held 4 different workshops
- Heritage: The number one threat was “connectiveness” – a lack of connection between young people and their heritage. As a result YES! was developed and funded

Review threats - Madrean Archipelago Rapid Ecoregional Assessment (*Karen Simms*)

- Identified “change agents” – Climate Change, development, invasive species, wildland fire impacts (specifically catastrophic fires)
- They are also looking at “Conservation Elements” – species/communities, plants and animals.
- This is all developed in a GIS framework.
- More info on www.blm.gov (programs → landscape → ecoregional assessment)

LCNCA Data and Gaps Analysis November 2013 workshop results (*Tahnee Robertson*)

- Looked at 10 years of data collection, and worked to identify trends and gaps.
- See [matrix](#) that looks at trends and data by resource area. This is what is already being done

Pima County Watershed Assessment (*Brian Powell*)

- PC owns and manages Cienega Creek Preserve – at the “tail end” of the watershed
- Just started the assessment. It is focused on whole watershed, not just Pima County land
- Will develop series of reports pulling together existing data (climate, land cover, vegetation change, etc.)
- Will include threats identification
- Want to identify what Pima County can effect and where they should put their energy

Scenario planning resource prioritization results (*Amy Markstein*)

- Developed three different climate scenarios (drier and dustier SW; a longer rainy season; shorter rainy season with extreme events)
- Groups worked to develop management priority scenarios
 - Groups: Montane, riparian, upland, heritage
- Next step will be to look at current management and how it is affected under all three different scenarios.
- The last step will be to develop indicators to help figure out which future we are heading towards

Note: YES! Project is developing a pilot training for scientists who want to work with youth

Discussion: Why is this effort important?

- To be able to manage across the landscape, across jurisdictions
- Good baseline information in light of all threats
- Stretch our budgets by collaborating
- Be able to communicate with public, make people feel connected and encourage them to take action to protect the watershed
- Figure out how individual programs can contribute to the work here
- Transferability - Would like to see this expanded to other areas in the state
- Environmental advocacy
- Context - Determine how what happens on a smaller area fits into the larger picture
- Data available - LIDAR acquisition has been expanded to cover much of the southeast portion of state, including the NCA.
- Early warning – synthesize and see trends earlier than we might otherwise
- Inform other efforts
- Comprehensive look – nobody knows everything. Involving more people gives you a variety of perspectives.
- Difficult that agencies keep collecting different data. Need to find a way to coordinate and streamline
- Management of data – centralized place to find data
- Sustainability is a balancing act – do we need to define what impacts we are willing to tolerate?
- Thresholds/tipping points - Indicators should help us know when we have passed a threshold. (Proclamation of NCA, as well as Cienega Preserve management plan helps to frame this).
- How does the LCNCA Plan Evaluation fit into this?

Discussion: What is the goal/objective?

- Overall health of the watershed, and to be able to communicate to people who are not scientists, and involve them.
- You have to look at the objectives for the watershed and the indicators must match this. All the agencies and programs have different objectives.
- A general objective: monitor change over time
- Improve our understanding of source of change and what management should be applied
- Just measuring change is difficult because there are many different types of change. And do we want to parse out local-scale human change, vs. larger change like climate change
- 8-9 indicators to measure major systems (biophysical and social/cultural)

Indicator Selection Criteria

Plenary group brainstorm

- Can measure thresholds/tipping points
- Cheap/cost effective
- Simple and reliable to collect
- Transferable – not just for one jurisdiction or cross-shed
- Repeatable, comparable, consistent
- Cross-jurisdictionality
- Targeted – Management relevance
- Trendability
- Quantifiable
- Uniquely measures impact of climate change
- Uniquely measures impact of human use
- Ecosystem integrity
- Standardized methodology
- Usefulness – short and long term
- Ability to analyze
- Can help address threats and vulnerability

Indicator development in small groups

Heritage, Socio-economic and Community

Goals

- Sustain cultural systems
- Sustain “values”
 - Collaboration and partnerships
 - Transfer to succeeding generations
- Expand traditional values to include restoration (i.e. eco-tourism, restoration economy, etc.)
- Maintain traditional lifestyles in a sustainable way (including tribal)
- Engagement and stewardships
- Protect physical sites
- Maintain natural places for visitors
- Effective communication system
- Manage for change

Additional Criteria specific to this topic

- Legal requirements
- Ties back to values

Candidate Indicators

- Site condition: damage assessment from nature and humans (*being done now, but not everywhere*)
- Resource conditions to support traditional uses and visitation
- Number of engagement programs/people (including youth). Not just awareness building or outreach programs
- Restoration and resource jobs created (*unsure if this is being done*)
- Percentage of residents aware of issues (*don't think this is being done*)
- Behavior change metric (*don't think this is being done*)
- Methods in place to communicate change and get public feedback
- Recreation baseline and trends
- Number and effectiveness of partnerships/collaborations (*don't know if this is being done*)
- Diversity and representativeness of people involved in partnerships/collaborations (*doing now – SIA, CWP, Borderlands*)
- Sustained involvement
- Metric on youth “voice” and inclusion – internships, school programs, etc. (*doing now – CWP, BLM, USFS*)
- Collecting and disseminating shared history in multiple forms (*doing now – CWP, ERF*)
- Educational resources for local area – training, curriculum, mentors, etc. (*many are doing now, CWP pulling together*)

Next steps

- Develop metrics to measure these things
- Target folks who measure now or have ideas
- Look at IGT indicators projects

Landscape

Watershed health goals

- Connectivity, ecosystem function and integrity
- Stability – soils, vegetation, wildlife, habitats
- Resiliency and equilibrium
- Adaptation to climate change
- Air quality

Proposed indicators and sources of data

- Road density (ADOT, ARNOLD)
- Seeps and springs (Sky Island Alliance inventory)
- Distance of perennial flow/wet-dry (BLM/PAG)
- Depth to water (BLM wells data)
- Climate change/variability data (precipitation, temperature (BLM, VER)
- Vegetation communities (BLM?)
- Invasive species (BLM?)

- Game monitoring info (AZGF)
- Land use and tenure (ownership, density, use, restrictions)
- Land cover and development (NLCD, 5 years)

Other potential indicators (though more difficult, expensive, less accessible)

- Land form monitoring - erosion, sediment transport
- Air quality (DEQ?)
- Recreation use (BLM?)

Riparian/Aquatic/Water

Missing criteria added by group

- Ability to communicate information to leaders and public
- Ability to involve people living in the watershed

Overall Goals (+ indicates this meets criteria)

Indicators

Water Indicators:

- +rainfall (rain log)
- +flow- base flow trends, runoff peaks
- +groundwater levels- depth to water trend streamflow miles and
- +distribution (temporal and spatial)
- +recharge- runoff infiltration
- +wells - number wells, density, pumping in shallow groundwater, trends (throughout watershed)
- precipitation- departure from average (per season, long term)
- +water quality- DO at LCNCA, metals related to industry close to the
- +source, water temperature, springs assessments (ongoing at Davidson at Empire Gulch) and discharge

Physical Processes indicators:

- Wetlands and floodplain function,
- Controlling erosion,
- Maintaining natural geomorphology,
- Maintaining a dynamic equilibrium
- Head cut monitoring (ADEQ, PAG and BLM) through incision cross section or LIDAR
- Flood return interval

Species indicators

- +Fish and frog presence distribution (fish and wildlife, PAG, BLM mandated)
- BLM does belt transects for this,
- Species composition, cover- (phenology network) include xeri-riparian Use LIDAR
- Bird surveys (Audubon)
- Migratory species tracking (sky island)

Data/analysis gaps

- Vertical gradient framework
- Isotopes for source waters (just started with PAG, AU, PC)

- Geology
- Space between

Other groups working on these related topics

- Connectivity 'economics' recreation
- Community awareness
- Community involvement

Moving forward

- Create broader technical teams - contact list, ask attendees if will join CWP advisory list per interest area Identify locations of resources- directory is part done, map
- Create clearinghouse, house it -disbursed model

Next Steps

- Continue wet/dry mapping (Brian, Gita),
- Help Jeanmarie with input on her hydro-geo assessment tool
- Think about using interns through U of A masters GIS program
- Organize list into priorities, judge against criteria, who will listen and what does public know, what can create response
- Create recommendations for response plan
- ID Thresholds
- Define goals
- Deal with data gaps
- Write funding proposal
- Update doc of current monitoring

Uplands/Montane

Goal - Maintain and improve upland ecological functions through soil site stability, hydrologic function and biotic integrity.

Missing criteria - No criteria, aside from what was collected by the room as a whole, was thought necessary

Indicators of focus

- Bare ground -- Core measurements needed = High Priority
- Perennial herbaceous basal cover and composition -- Core measurements needed= High Priority
- Dominance of non-native vegetation -- Core measurements needed = High Priority
- Shrub and woody plant cover, density and composition in grasslands relative to site potential -- Core measurements needed = High Priority
- Rainfall amount and timing -- Core measurements needed = High Priority
- Mass mortality events (e.g. oak die-offs) -- Core measurements needed = High Priority

Additional Indicators of lower priority:

- Fire return interval -- Not enough information= low priority for this group at this time
- Erosional features -- Needed but not at current time = low priority for this group
- Vegetation community change over time -- Already underway by other group or agency= medium priority in relation to this group

- Phenological changes (e.g. spring green-up time) -- Already underway by other group or agency= medium priority in relation to this group

Additional indicators recommended from group at large:

- Wildlife and Roads

Next steps

- Work with partners to determine what can be synthesized cross-jurisdictionally
- Compile baseline synthesis in repeatable template
- Evaluate data
- Write a funding proposal

Potential partners to contact

- Pima County- Brian Powel has a large amount of information already synthesized
- Forest Service- Will require going to different Forest Service districts for information
- RAWs online- Many agencies have rain data available
- Rosemont may have information available
- NRCS should be contacted for their information

Next Steps for SOW

- Notes (SDR)
- SOW planning team meeting, plus others interested, to work on synthesis and plan forward