A CONTRAST AMONG NATIONAL FOREST WATERSHED PROGRAMS: 1978 - 2008

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Watershed management program on the Coronado National Forest has changed dramatically in the thirty years between 1978 and 2008. This paper presents the changes brought about by changes in national leadership, program emphasis, funding level, and technology. The Coronado National Forest is located in Southeastern Arizona and Southwestern New Mexico, in the Southwestern Region. The watershed management program on the Coronado National Forest has been influenced by four factors throughout the period of 1978 -2008: National Leadership; local Program Emphasis; Funding Level for the program; and Technology available. Each of these factors is addressed briefly below. The meaning of "National Leadership" has been identified by the Chief of the Forest Service in office at the time.

1978-1979: Chief John McGuire
National Leadership

Chief McGuire was nearing the end of his term in office in 1978. The National Forest Management Act of 1976 was just beginning to be implemented. McGuire is quoted as saying "perhaps the greatest challenge facing forestry today is the calendar-namely the arrival of the 21st century.My question is, will American forestry be ready to meet the 21st century?" (http://www.foresthistory.org/, 2004).

Program Emphasis

A Supreme Court Decision shaped local program emphasis. The Mimbres Decision of 1978 took the Forest Service by surprise (Gillilan and Brown, 1997). The decision said that while the Multiple-Use Sustained-Yield Act of 1960 (Public Law 86-517) was intended to broaden the purposes for which national forests had previously been administered, Congress did not intend to reserve additional water in forests previously withdrawn under the 1897 Act. The effect of the decision was that all the Forests in New Mexico and Arizona had to research all water uses and determine if any needed to be certified through the respective State water codes. Over 2,000 water uses on the Coronado National Forest alone required certification. Fortunately, Arizona had laws in effect at the time that allowed for registration of existing uses. Nearly all of the hydrologists' time on the Forest was consumed by the research and registration of water rights during 1978 and 1979.

Funding Level

Budget not an issue. A staff of four Soil Scientists and two Hydrologists was adequately funded. Timber and range programs were well funded and drove most activity, while watershed funds provided for an aggressive watershed restoration program. The majority of all water uses were for range allotment administration, and range funds paid for the registration costs.

Technology

The entire Forest Service had one computer, located at the Fort Collins Computer Center. Land Management Planning efforts tried to use that computer by requiring the use of "FORPLAN" (U. S. Congress, Office of Technology Assessment, 1992). With nearly all National Forests competing for time, scheduling difficulties and computer time backlogs were common. The planning process dragged on for years.

1979-1987: Chief Max Peterson
National Leadership

Chief Peterson took on the task of implementing the National Forest Management Act of 1976 from John McGuire. He was concerned about the potential for controversy and was quoted as saying "...the resources of these (National Forest) lands are wanted by a large number of diverse users who see them as critical to meeting their future needs. Many also see their own desired use as either exclusive of other potential users or at least incompatible with

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them. In any language, that spells controversy" (http://www.foresthistory.org/ 2004).

Program Emphasis

Water rights issues continued, as water rights registrations were winding down, the Gila River Adjudication proceedings began. More filings were required. The budget drove other program components, first a large amount of erosion control and other watershed restoration work, then adding other assignments not directly related to watershed. A third hydrologist was added to the Coronado staff. The Forest Plan on the Coronado National Forest was completed in 1986, and the Forest set about trying to implement it. The Plan included standards for riparian areas and direction to determine how many Coronado National Forest riparian areas met those stands. It also called for at least 50 percent of all riparian areas to be in satisfactory condition by the end of the first 10-year period. No definitions for "satisfactory condition" were given, and the standards referred to "natural conditions" with no definition for what "natural" was. A Forest protocol for riparian area assessment was developed in 1984, based almost entirely on vegetation parameters even though the Plan had standards for channel morphology as well.

Funding Level

The 1980 budget came with money and targets for watershed restoration. Burchard Heede of the Rocky Mountain Research Station had published more than 80 articles on gully rehabilitation and soil erosion control (USDA Forest Service, Rocky Mountain Station, 1993, Stream Notes, 1993). His work was used to design erosion control projects. However, by 1987 budgets had become an issue for the watershed management program. The Coronado National Forest reduced staffing from three hydrologists and four soil scientists to one hydrologist and one soil scientist, then assigned other duties including forestry program management and special uses management to these individuals.

Technology

Computers became more available, but using them to design projects still required the Fort Collins Computer Center. By the end of 1986, almost all Forest Service employees had a Data General Computer on their desk. Electronic messages (e-mail) and cell phones began to play a role in everyday work.

1987-1993: Chief Dale Robertson
National Leadership

In response to the arrival of controversy as predicted by Chief Peterson, Chief Robertson led efforts by the Forest Service to find new and creative ways to manage the national forests, especially by emphasizing non-commodity (non-timber) resources, new forestry, new perspectives, and ecosystem management. Chief Robertson is credited with coining the "caring for the land and serving people" slogan (http://www.foresthistory.org/ 2004)

Program Emphasis

The wildfire season during 1987 in the west was huge and widely spread, including Yellowstone National Park and multiple National Forests in California. Locally on the Coronado National Forest, a prescribed burn in the Chiricahua Mountains escaped and caused concern about future prescribed burning programs and effects on watershed components. Regional Forester Sotero Muniz called for better management of riparian areas, resulting in a regional level effort to develop a riparian area assessment and monitoring protocol. The national call for ecosystem management resulted in the range management program on the Coronado to come under intense scrutiny, especially with regard to how it affected riparian areas. The new Regional protocol for riparian area assessment called "Riparian Area Survey and Evaluation" (RASES) came out in 1989 and was pressed into service to respond to the demand for information and proposals to improve riparian areas that didn't measure up. It included channel morphology and soil parameters in addition to vegetation. The Coronado, along with the Tonto National Forest modified RASES to fit local situations. The initial response to the assessments was to fence cattle out of riparian areas, but criticism mounted, as it seemed to be contrary to the national direction for holistic ecosystem management. The upland watersheds

began to suffer a threat in addition to grazing and wildfire as a bark beetle attack killed a large number of mature ponderosa pine trees.

Funding Level

Budgets began to become a serious concern as the timber and range programs lost their power, and the budget process did not include "ecosystem management" as a line item or target accomplishment. The solutions were not immediately apparent.

Technology

Computers, pagers, and cell phones became increasingly important to day-to-day operations. Typing pools, which traditionally had carried out most tasks involving the preparation and filing of documents, disappeared and all employees were expected to do their own document preparation on their computers. The time required not only to do these added tasks, but to get trained on the rapidly developing technology was becoming a greater fraction of all employees', not just watershed management personnel, work time.

1993-1996: Chief Jack Ward Thomas
National Leadership

Chief Thomas supported the implementation of a new ecosystem management approach on the national forests and grasslands. He is quoted as saying "ecosystem management is not just a timber sale; it's putting the timber sale into a bigger picture, including the watersheds, wildlife, roads, and people's needs and values..." (http://www.foresthistory.org/ 2005).

Program Emphasis

Watersheds were often thought of as a starting point to define areas in which to accomplish "ecosystem management." Ecosystem management resulted in a need for more information about watershed conditions at a variety of scales. Most of the data needed to do assessments was not available, so searches for data began in earnest. The General Ecosystem Survey, completed at the Regional level for Arizona and New Mexico in 1990 as an oversight part of the terrestrial ecosystem survey which would provide detailed soil and vegetation information was looked to, as was the RASES information and Arizona Department of Environmental Quality Water Assessments. The Rescission Act of 1995 (Rescission Act of 1995 (Public Law 104-19 Section 504(a)) required range allotment permits to have an environmental analysis under the National Environmental Policy Act (NEPA) completed before they could be issued. This caused watershed assessments to be prioritized in favor of those allotments needing analysis first. Nearly all watershed program activities in 1996 were in response to range allotment NEPA.

An unprecedented event in 1994 occurred when a lightning ignited wildfire in the Chiricahua Mountains burned over 27,000 acres mostly in mixed conifer forest, affecting every watershed on the range. Rucker Lake, the popular recreation development in Rucker Canyon was completely filled with sediment following the fire, and was abandoned. (Lefevre and Neary, 1999). Several large forest fires occurred in the Rincon Mountains and Huachuca Mountains, requiring emergency burned area assessments.

Funding Level

Range program funding began to increase to respond to the NEPA analyses. Watershed program personnel were funded through this, as watershed line items declined.

Technology

In addition to more computer technology, all terrain vehicles were being added to our fleet. Improved mobility and access made the assessments somewhat more efficient, but training to keep up with new technology offset some of the benefits.

1996-2001: Chief Mike Dombeck
National Leadership

Chief Dombeck focused his efforts on promoting partnerships, collaborative stewardship, accountability, and financial health. An avid fisherman, he considered watershed management an important task: "Watershed maintenance and restoration are the oldest and highest callings of the Forest Service" (http://www.foresthistory.org/2004).

Program Emphasis

In spite of the call for watershed programs to take their place at the center of National Forest management, an increased emphasis on fuel management arose in response to large wildfires both locally and on the national scene. This in turn resulted in a need to assess watershed impacts from more mechanical vegetation treatments and prescribed burns in addition to the continued demand for analysis of range allotments. Endangered aquatic species on the Coronado National Forest began to take center stage as drought caused habitats to shrink. The last remaining populations of native frogs and fishes were frequently found in waters found to harbor introduced species and disease in addition to being located in range allotments. The demand for data and analysis to develop proposed actions to save these habitats became intense. The RASES and newly developed "Soil Quality Assessment" (FSH 2509.18, 1999) were stretched to their limits in attempts to help decision makers.

Funding Level

Funding levels stayed flat in the face of rising costs of doing business. Local watershed program personnel, already assigned other programs including forestry and special uses, diversified by getting training to support wildfire suppression actions.

Technology

Geographic Information Systems (GIS) began to become the accepted way to conduct and display nearly all analyses. The programs required training and space to run, and computers began to fail as more and more demands were placed on them. Bigger, more powerful computers began to replace the original Data General models, and by 1997 many documents created on the Data General computers were no longer available. Hard copies became invaluable as it was discovered that we could no longer read or print documents created as recently as 1994.

2001-2007: Chief Dale Bosworth

National Leadership

Chief Bosworth continued the recent trend in national direction to build relationships and partnerships. He tried to get more traditional authority to the District Rangers by saying the "decisions need to be made at the lowest level that they can. We need to build better relationships with local communities and with states, tribes, and others" (http://www.foresthistory.org/, 2007).

Program Emphasis

As national emphasis pointed toward more local relationships, the Coronado was forced into intense local situations that required relationships with the counties and communities. Wildfires in the Santa Catalina, Pinaleño, Tumacacori, Huachuca, and Santa Rita Mountains required detailed burned area assessments. Large burned area emergency response (BAER) teams were formed, absorbing large amounts of watershed personnel time, and that after extended tours on suppression assignments by the same individuals. Implementation of the BAER projects, followed by long term restoration needs and project implementation resulted in the watershed program being dominated by wildfires. The unexpected number of large fires nationally resulted in a renewed call for action to manage forests. The Healthy Forest Restoration Act (HFRA) (PL 108-148) of 2003 called for specific action that required some watershed assessment. The Rescission Act schedule also required continued assessment to complete range allotment analyses.

Funding Level

The HFRA projects and range management NEPA provided funding, as did a Southwestern Region initiative to gather data for potential instream flow water rights. New hydrologist and silviculturist positions were added to the Coronado organization to assist in these programs.

Technology

Digital cameras began to be more common, as did global positioning system (GPS) units. Both of these new technologies could be linked to the GIS projects, creating complex data storage situations requiring even more powerful computers.

2007-present: Chief Abigail Kimbell National Leadership

Chief Kimbell has started her term continuing the emphasis on ecosystem management. She is quoted as saying "we have to manage for the health of the whole landscape- for clean water, for wildlife habitat, for healthy vegetation, for recreation" (http://www.foresthistory.org/ 2008).

Program Emphasis

Forest restoration with an emphasis on fuels management and range allotment NEPA continue to demand much of the watershed program attention. Burned area restoration and response to situations within the burned areas also commands attention. Forest Plan Revision is requiring a new look at water resources. The Gila River adjudication and other continuing water rights issues (refer to 1978 discussion) are still in progress, thirty years after they began, with no end in sight.

Funding Level

Budget levels remain static. Watershed personnel continue to respond to projects and programs, and are funded by them. In addition to forest restoration and range management, new mineral development is starting to command a lot of attention and time.

Technology

All the computer hardware purchased and maintained over the last decade is slowly being upgraded and replaced. Software support has been centralized.

CONCLUSIONS

Thirty years of change, especially in national leadership and technology, have had little effect on local programs for the Coronado National Forest. Water rights and riparian areas continue to dominate the program. Plan revision offers the opportunity to make riparian area assessment and management more meaningful, but how to accomplish it remains difficult. As population and demands on the Forest increase while drought threatens day-to-day supply, water use and rights remain important topics.

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