Coronado National Forest
Monitoring and Evaluation
Trend Analysis
1986 to 2008

Certification

The Land and Resource Management Plan for the Coronado National Forest (Coronado Forest Plan) was approved August 4, 1986. Since that date there have been twelve amendments and three change notices.

I have reviewed this Monitoring and Evaluation Trend Analysis for the Coronado Forest Plan, noting that it is one in a suite of documents that underlie a determination that the Coronado Forest Plan is ripe for revision in compliance with the National Forest Management Act and its implementing regulations. I have reviewed the recommendations for change documented in this report and have assigned appropriate Forest staff to developing revision proposals.

Revision of the Coronado Forest Plan will be undertaken in compliance with public participation and pertinent National Environmental Policy Act (NEPA) procedures.

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7/22/09
DATE

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Introduction

The Coronado National Forest Plan (Forest Plan) was approved in 1986. Since then, periodic reviews of the implementation and effectiveness of the Forest Plan have been conducted and documented in monitoring and evaluation reports. The "1986 to 2008 Monitoring and Evaluation Reports Trend Analysis" represents a comprehensive look at all of the Forest Plan monitoring information that has been collected to date, along with an analysis of trends represented by that information. Management implications of trends are discussed, and recommendations for changes in management direction are made. The analysis is organized around the original issues, concerns, and management opportunities identified in the Forest Plan (USFS 1986, pp. 3 – 6). This analysis is part of the information base used to inform the revision of the Forest Plan.

Recreation and Visual Quality

2008 National Visitor Use Monitoring Report

The National Visitor Use Monitoring (NVUM) Project released its most recent results in October of 2008, providing recreation trend analysis at the forest level for a number of visitor use characteristics. Trend analysis and estimates of visitor use, including site and forest visits, activity participation, facility visits, spending, and visitor satisfaction, are based on samples taken in FY2001 and FY2007. The total number of estimated site visits, including those to designated Wilderness areas, decreased by one percent during the period, while total estimated National Forest visits increased by 6.7 percent, reflecting the moderate decrease in average number of sites visited per National Forest visit. In FY2001, 18.3 percent of those total estimated site visits were to designated Wilderness areas; similarly, 17.1 percent were to designated Wilderness areas in FY2007. For both sample periods, more than 60 percent of Wilderness visitors were male. Length of stay did not appreciably change for any visit type.

The number of Coronado National Forest visitors participating in developed camping, fishing, picnicking, historic site viewing, relaxing, and driving for pleasure increased modestly between FY2001 and FY2007; also, wildlife viewing and hiking/walking saw large increases in participation. In contrast, participants in primitive camping, backpacking, hunting, horseback riding, and snow-based activities decreased over the same period. Visitors used scenic byways, museums, and interpretive displays more in FY2007, but used forest roads less. While changes in activity and facilities usage could have management implications, the NVUM report cautions against interpreting these as significant changes, since certain aspects of the sampling methodology were modified between the first and second round of data collection on the Forest.

As might be anticipated, "local" visitors to the Coronado National Forest outnumbered "non-local" visitors for both sample sets at a ratio of about 4:1; of the local visitors, day visits comprised over 60 percent of total visits in both FY2001 and FY2007, while day visits made up only 7 percent of all Forest visits for the non-local visitor category. Spending information was not collected in FY2001. However, the FY2007 sample reports average total trip spending per visiting party at $517.00, with median total trip spending at only $50.00.

The NVUM report also offers a wealth of satisfaction information, only some of which is summarized here. Overall, 83 percent of Forest visits received the highest satisfaction rating in FY2007; another 14 percent received a Somewhat Satisfied rating (overall satisfaction was not analyzed in FY2001). Between the sample periods, improvements were made in the percent of visitors whose expectations were being met for Developed Facilities and Services across the Forest, and for Access and Perception of Safety in Undeveloped Forest areas only. Visitors overwhelmingly expressed elevated Importance-Performance ratings in FY2007 for categories such as restroom cleanliness, developed facility condition, and road condition for all non-Wilderness Forest areas. In general, the NVUM report suggests that the Coronado National Forest is delivering a satisfactory outdoor recreation program to its visitors.

Coronado Forest Plan Recreation and Visual Quality Issues

1. Identification of potential overuse areas and establishment of carrying capacities (number of people who can use an area without damage to natural resources
2. Regulation of off-road vehicle use to protect other Forest resources and uses, while continuing to provide this much-demanded recreational opportunity.
3. Use of land for recreational development and dispersed uses, and establishment of equitable fees for recreational use
4. The role of the private sector in providing recreation services on and adjacent to the national forest must be reassessed
5. Inventory and management planning for the Coronado's many caves and location of this resource to recreational, scientific, and Wilderness uses
6. Visual resource integrity in all land management decisions

Issue 1: Identification of potential overuse areas and establishment of carrying capacities (number of people who can use an area without damage to natural resources)

This is still a valid issue for management of the Coronado National Forest. The population of southeastern Arizona and southwestern New Mexico continues to grow, resulting in many recreation areas on the Coronado reaching or exceeding recreation capacity on a regular basis. This situation is a complex problem that will not be easy to resolve and is expected to continue to escalate for the foreseeable future.

The 1992 and 1999 evaluations do not supply sufficient information for a trend analysis. Recreation concept plans partially addressed carrying capacity for some areas, but plans for many other areas were never completed.

Although it is fairly simple to determine a recreation carrying capacity for developed recreation sites based on number of parking spaces or campsites, determination of a carrying capacity for the remainder of the Coronado (especially dispersed sites), and determining a carrying capacity that does not substantially impact natural resources is more challenging.

The issue one mentions "potential overuse areas," yet what is more readily identifiable are "existing overuse areas" and, once such are acknowledged, management tends to react as needed to the specific situation. Over the past 15 years, this management style has been exercised in many locations across the Coronado.

Concept plans need to be revisited and updated. The Sabino Canyon Recreation Concept Plan will be revised in 2009. Plans are needed for high recreation use areas currently lacking them. Capacity studies are also needed for areas of high use dispersed, permitted, and developed recreation.

The 1999 evaluation suggests maintaining a log (or register) for hang-gliding and rock-climbing. In the case of rock climbing, none has been maintained. In the case of hang-gliding, none is needed because this sport now uses a permit system and gated road to control use. In the future, the hang-gliding permit count should provide a reasonable substitute system. As the variety of recreational activities on the Coronado National Forest increases, so does the potential for damage to resources and conflicts between users. A recent example

is the recreational use of kite-wing aircraft in Cave Creek Canyon, and the resulting conflict with those desiring a quiet experience.

Need for Change Recommendation

This is an issue that will continue to exist on the Coronado National Forest. Forest managers will continually need to be aware of overused areas and resource damage and act as needed to resolve issues. The need remains to plan for and carry out capacity studies on high use areas, especially those used by the public and permittees.

The current Forest Plan allows dispersed camping up to 300 feet off of any road. The 2005 Travel Management Rule[1] now governs off-highway vehicle use and dispersed camping within the Forest. This rule will be implemented on the Coronado in 2009, and the 300 foot corridor identified in the current Forest Plan will be changed accordingly. In preparation for Travel Management Rule implementation, and in conjunction with direction from the Southwestern Regional Forester, the Coronado National Forest is gathering data and collecting public comments about dispersed camping areas. This information will be used in future determinations regarding dispersed camping on the Forest.

The Coronado National Forest is awaiting completion of direction from the Southwest Region that will be used in establishing future policies governing hunting and the use of vehicles off designated routes.

Issue 2: Regulation of off-road vehicle use to protect other Forest resources and uses, while continuing to provide this much-demanded recreational opportunity

Off-highway vehicle use across the States of Arizona and New Mexico, as well as nationally, has more than tripled in the last 20 years, based on the sales of all-terrain vehicles and dirt bikes. In the 1986 Forest Plan, off-highway vehicle use was restricted to designated roads or in some areas to trails designated for motorized use.

In 1994, a decision was made to implement the *Santa Rita Off-Highway Vehicle Development Projects* to provide quality recreation experiences that accommodate off-highway vehicle users. This decision allowed the Coronado National Forest to develop an information system for off-highway vehicle users (brochures and information boards with maps) so users would be directed to roads that are appropriate and legal for off-highway vehicle traffic (one location also allowed for off-highway vehicle loading ramps). This process also located and designated readily visible "information areas" to provide off-highway vehicle users information about riding opportunities that would result in the least amount of impacts to Forest resources. The information areas are located near major intersections so as to minimize impacts to nearby private lands. Implementation of this decision, when Forest Protection Officer compliance positions are in place and funded, has reduced the amount of illegal off-highway vehicle use and associated impacts.

In 1996, a decision was made to implement the *Catalina Off-Highway Vehicle Recreation Proposal – Redington Pass Area.* Implementation of this decision resulted in mapping of an

[1] 36 CFR Parts 212, 251, 261, and 295 Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule; Federal Register, pages 68264 to 68291;November 9, 2005

approved off-highway vehicle system of roads and trails in the vicinity of Redington Pass, installation of information signboards, marking of existing routes, development of a brochure with map showing route locations, and rehabilitation of two resource problem areas (Race Track Tank and Chiva Falls Road). This decision also provided for construction of a new staging/trailhead area with vehicle loading ramps (Alhambre), construction of restroom and ramada facilities, and creation of three new off-highway vehicle trails. Additionally, the decision amended the 1986 Forest Plan (Amendment 1) to allow motorized vehicles only on designated off-highway vehicle trails. Together, all these improvements have improved the quality of the recreation experience for off-highway vehicle users on the Santa Catalina Ranger District.

Road closures in the vicinity of Sycamore Canyon south of Ruby Road were initiated in 1998. These closures were monitored in 1999 and 2000; monitoring continues. Data obtained in these monitoring efforts needs to be reviewed and, if warranted, updated closure orders need to be issued.

In 1999, decisions based on a categorical exclusion were implemented to provide informational brochures, road number signing, and "Resource Damage Area Closed" signing in the South Patagonia Off-Highway Vehicle Area (Sierra Vista Ranger District). Implementation also provided users with information brochures indicating roads that allow off-highway vehicle use, fencing of some areas for purposes of protecting the endangered Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), and protection of other resource areas. Since 1999, Pima pineapple cactus monitoring and fencing have been in place on the Sierra Vista Ranger District. The fence continues to be monitored by wildlife staff, but the collected data needs to be reviewed to determine if issuing updated closure orders for the enclosure are warranted.

In November 2005, the Forest Service adopted a Travel Management Rule[2] governing off-highway vehicle and other motor vehicle use on National Forest System lands nationwide. Implementation of the Rule guidance is ongoing. Establishment of oversight direction for management of off-highway vehicles and other motorized vehicles on Forest roads and trails is expected by 2009. When completed, this direction will provide for production of a map of roads, trails, and areas designated for public off-highway vehicle use, along with designations of vehicle class and season of use.

Need for Change Recommendation

There is a need to change the way off-highway vehicle use is addressed on the Coronado National Forest. The number of off-highway and motorized vehicles in use on the Forest is increasing every year and the trend is for demand for areas to ride off-highway vehicles to increase commensurate with ongoing population increases, along with the need for associated facilities such as trailhead parking, off-loading areas, and camping accommodations.

The 2005 Travel Management Rule provides clear direction regarding off-highway vehicle management for use of off-highway and other motorized vehicles on National Forest System lands. This direction will need to be reflected in the revised Forest Plan.

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[2] Ibid

Issue 3: Use of land for recreational development and dispersed uses, and establishment of equitable fees for recreational use

This issue encompasses three aspects of recreation uses: (a) developed recreation, (b) dispersed recreation, and (c) appropriate fees. The 1992, 1998, 2001, 2002, and 2004 Monitoring Reports do not consistently address the same topics; some report on visitor use and satisfaction, as well as Recreation Opportunity Spectrum settings. Although these are also recreation issues, they are not necessarily directly related to the main topic(s); therefore, good trend analyses are not entirely feasible. What is clear, based on reports and current knowledge, is that recreational demand on the Coronado National Forest continues to grow and budgets sufficient to provide quality developed recreation facilities and high quality management of the numerous dispersed sites across the Forest are not available.

The Coronado National Forest has at least $3.2 million of deferred maintenance needs in developed recreation sites, with a nearly $800,000 gap to meet annual operations and maintenance needs (both figures are derived from Recreation Facility Analysis data, April 2005). Additionally, many dispersed sites (especially popular off-highway vehicle areas) are heavily impacted by use. User fees alone cannot resolve this problem.

Recreation Facility Analysis continues to evolve concurrent with the developments of the INFRA database for Coronado developed sites data. The Recreation Facility Analysis Program of Work was approved in November 2007 and the Forest will use it to guide decisions about the operation of developed sites on the Forest. When available, this analysis is expected to assist with reducing the deferred maintenance backlog for the five years following its establishment.

The amount of use fees collected in developed sites and high impact recreation areas on the Coronado are expected to increase slightly over the next five years. If the expected increase is combined with appropriated dollars (currently expected to remain at current appropriation levels) the Forest can expect an upward swing in the number of dollars available to maintain the current sites given expected changes implemented from the Recreation Facility Analysis and from the Capital Improvement Process.

Need for Change Recommendation

The issue here will continue to challenge the Coronado National Forest. Revision of the 1986 Forest Plan is expected to assist with establishment of more refined land use areas, including identification of places generally suitable for developed and dispersed recreation. Forest Service recreation budget allocations are expected to continue at levels too low to provide quality recreation services; therefore, the Forest will need to use a variety of tools to provide a base level of recreation opportunities. Some tools may include additional partnerships (with other governments and the private sector), additional user fees, and removing some sites.

The National Visitor Use Monitoring Assessment produces statistically valid results pertaining to the entire Coronado National Forest; however it does not provide data specific to sites, areas, Ecosystem Management Areas, or ranger districts. If this type of specific data becomes vitally important in the future, additional data-gathering tools will be needed.

Implementation of the results of the Recreation Facility Analysis over the years 2007 to 2012 will provide direction and resources, including projected slight increases in fee revenues, necessary to continue operation of developed sites to standard and to reduce deferred maintenance by a percentage each year.

Issue 4: The role of the private sector in providing recreation services on and adjacent to the national forest must be reassessed

The 1992 evaluation alone does not supply sufficient information to complete a trend analysis for this issue. However, as Forest Service recreation budgets continue to decline and use continues to increase, the Coronado National Forest will need to rely more heavily on assistance from the private sector to provide quality outdoor recreation opportunities to the public. Because the Coronado National Forest encompasses the majority of the high-elevation lands in southeastern Arizona (other nearby lands do not provide similar settings), this private sector help will need to be implemented primarily within the Forest boundaries. The Forest is currently completing a Recreation Facility Analysis to identify on-Forest developed recreation sites for which the Forest Service has insufficient funding for maintenance or operation. It is anticipated this planning will identify sites that could be operated by the private sector.

Using partnerships and volunteers is a continuing trend in the Forest's recreation program, it has been in the past, and will continue to be a major strategy for keeping developed sites and dispersed areas clean and maintained.

Need for Change Recommendation

This is still a valid issue and it will continue to exist on the Coronado National Forest.

Issue 5: Inventory and management planning for the Coronado's many caves and location of this resource to recreational, scientific, and Wilderness uses

Trend Analysis 1986 through 2008

Monitoring of certain caves has occurred, including timing issues of entry to certain caves for wildlife protection.

Need for Change Recommendation

A need exists to continue to monitor and protect all cave resources on the Coronado National Forest.

Issue 6: Visual resource integrity in all land management decisions

Trend Analysis 1986 through 2008

The 1992 report focuses on the condition of visual quality since implementation of the Forest Plan, while the 2001, 2002, and 2003 reports discuss visibility due to air pollution from a local smelter for which monitoring was discontinued. Therefore, existing monitoring data provide insufficient information from which to develop a trend analysis.

Nevertheless, the integrity of visual resources remains a concern to be addressed by the Coronado National Forest. Monitoring data show that visual resources and impacts to them are regularly considered during environmental analyses, and that this resource is impacted by

management activities and decisions. The impacts are due in part to the inability to protect this resource by any means other than denying implementation of proposals. Monitoring data also show that visual resources are also sometimes impacted by influences beyond the control of the Coronado National Forest.

The trend is that visual quality (scenic integrity) in southeastern Arizona is being degraded. Some forms of this degradation are readily visible, such as urban sprawl along the Forest boundary. There is also a slow loss of scenic landscapes on public lands. These losses are attributable to numerous sources, including but not limited to: (a) illegal border crossers and their associated unplanned trails and camps, piles of trash and debris, and Border Patrol facilities necessary to patrol these areas: (b) technology infrastructure, including utility lines and cellular telephone towers; (c) mining activities; (d) astrophysical facilities; (e) development on private inholdings; (f) resource damage caused by off-highway vehicle use; and (g) wildcat target shooting.

Need for Change Recommendation

This is a major issue on the Coronado National Forest that will continue to grow in significance. Conversion to the Scenery Management System, a more defined analysis tool than its predecessor Visual Resource Management, will assist with management of this issue, including providing direction for addressing scenery management in land and resource management issues. The Scenery Management System will also allow for ecosystem management projects and prescribed fire, which conflict with the current Visual Quality Objectives in the Forest Plan.

New Issues

New Isssues:

1. During Forest Plan revision meetings, the public has repeatedly stated that "quiet" recreation settings are highly valued and are increasingly rare on the Coronado NF.
2. Recreation along the International border with Mexico are being heavily impacted. Illegal border crossers create wildcat trails and leave enormous amounts of trash, Border Patrol infrastructure (fences, walls, towers) impacts recreation settings, and contact with both illegal and Border Patrol activity threatens visitor safety.

Wilderness

Coronado Forest Plan Wilderness Issues

1. Formulation of a recommendation to Congress concerning Wilderness status for the Bunk Robinson, Whitmire Canyon, and Mount Graham Wilderness Study Areas
2. Within the constraints of the Wilderness Act, decisions are needed concerning the intensity of management and investment for recreation, range, wildlife habitat, and fire management (including planned ignitions) within Wilderness Areas

Issue 1: Formulation of a recommendation to Congress concerning Wilderness status for the Bunk Robinson, Whitmire Canyon, and Mount Graham Wilderness Study Areas

Trend Analysis 1986 through 2008

The Coronado NF has a strong history of Wilderness values as evidenced by the establishment of two wilderness areas in the 1930's (Chiricahua, 1933 and Galiuro, 1932), decades before a nationwide Wilderness Preservation System was enacted. The Forest currently has eight wilderness areas and three wilderness study areas. The Pusch Ridge Wilderness abutting the City of Tucson was created in 1978, and the remaining five wildernesses were established in 1984 (Miller Peak, Mount Wrightson, Pajarita, Rincon Mountain, and Santa Teresa).

The Record of Decision for the 1986 Forest Plan recommended Wilderness designation for the Mount Graham Wilderness Study Area. This recommendation was forwarded to the Chief of the Forest Service for further action. The Forest does not have authority to move this process further and is awaiting action from higher levels of the agency and the Department of Agriculture.

The Record of Decision for the 1986 Forest Plan did not recommend the Bunk Robinson and Whitmire Canyon Wilderness Study Areas for Wilderness designation. No further action has been taken regarding the Wilderness status of these areas.

Need for Change Recommendation

There is a need to address the recommendations in the 1986 Forest Plan regarding the Wilderness Study Areas. However, this requires action at higher levels of the agency and department.

Issue 2: Within the constraints of the Wilderness Act, decisions are needed concerning the intensity of management and investment for recreation, range, wildlife habitat, and fire management (including planned ignitions) within Wilderness Areas

Trend Analysis 1986 through 2008

The two management concerns with respect to Wilderness Areas on the Coronado National Forest are recreation and catastrophic fire. Several wilderness areas (Management Area 9) encompass livestock range allotments. Monitoring raised no concerns with range/wilderness interactions. Likewise, monitoring raised no concerns with wildlife in designated Wilderness Areas.

Several of the monitoring and evaluation summaries address the Wilderness Opportunity Spectrum. Use of this tool on the Coronado National Forest was discontinued in the late 1990's.

The Coronado uses a variety of tools to monitor wilderness area use: (a) INFRA database[3]; (b) the Coronado National Forest Wilderness Education Plan[4]; (c) the Southwest Wilderness Advisory Group, which assists with wilderness information sharing and public education on the Forest and throughout the Southwest Region; (d) the 2005 R3 AFIRE Wilderness Management Strategy[5], which complements the national 10-Year Wilderness Stewardship Challenge[6]; and (e) the National Visitor Use Monitoring Assessment[7].

A National Visitor Use Monitoring assessment conducted on the Coronado National Forest in FY2001 showed 18.3 percent of those total estimated Coronado NF site visits were to designated Wilderness areas; similarly, 17.1 percent were to designated Wilderness areas in FY2007. Border crossing issues have increased in the Miller Peak; Pajarita; and to a lesser extent, the Mount Wrightson Wilderness Areas. This trend is expected to continue as the population in adjacent areas of the Republic of Mexico increases and the social climate of Mexico remains unchanged.

The current Coronado National Forest Fire Management Plan[8] allows (per Forest Plan Amendment 11) naturally occurring ignitions to be managed to reduce hazardous fuel accumulations, enhance ecosystem health, and maintain natural conditions within Wilderness Areas. Use of naturally occurring fires is constrained to fire-adapted ecosystems having an approved fire use plan. Past practice was to extinguish fires in Wilderness Areas, especially when highly visible to the public. This practice of extinguishing naturally occurring fires led to Wilderness Areas experiencing unnatural fuel levels. Although the 1986 Forest Plan provided some discretion to allow fire use in Wilderness Areas, this tool was seldom used.

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[3] Coronado National Forest Infrastructure Database, Business Area Wilderness
[4] USDA Forest Service. Coronado National Forest Wilderness Education Plan. September 2006.
[5] Southwestern Region Wilderness Management is AFIRE in Region 3. March 2005. http://fsweb.wo.fs.fed.us/rhwr/wilderness/10ywsc/index_10ywsc.html
[6] 10-Year Wilderness Stewardship Challenge. February 2005. http://fsweb.wo.fs.fed.us/rhwr/wilderness/10ywsc/index_10ywsc.html
[7] USDA Forest Service National Visitor Use Monitoring Program. http://www.fs.fed.us/recreation/programs/nvum/index.shtml
[8] USDA Forest Service. Coronado National Forest 2006 Fire Management Plan.

Human impacts following fire in Wilderness Areas has resulted in increased levels of noxious weeds and non-native plants in the Wilderness Areas.

Need for Change Recommendation

There will always be impacts to wildernesses from human use and natural events. Two needs for change were identified: (1) a need for change to keep these areas protected from human impacts through use of the Minimum Tool Analysis[9] (education to the public), and (2) re-establishment of a more natural fire regime.

At this time, recommendations for wilderness management are premature. Ongoing surveys through the National Visitor Use Monitoring process are not expected to yield results until Fiscal Year 2008. When those results are available, they will be combined with the tools currently available in the INFRA database and its associated monitoring, as well as recommendations from the Wilderness Education Plan, Southwest Wilderness Advisory Group, and national direction to develop wilderness management recommendations.

The Forest needs to continue ongoing cooperative efforts with the US Border Patrol to educate Border Patrol agents and administration on Forest Service wilderness policies and continue to coordinate with them regarding the Border Strategy, which is being jointly developed by the two agencies to address the impacts of border crossing on resources including wilderness.

New Issues

U.S. House of Representatives Bill 3287 (Grijalva, AZ) is a legislative proposal to establish additions to the National Wilderness Preservation System in the Tumacacori Mountain Range of the Coronado National Forest

On January 10, 2004, Representative Raul Grijalva (D. AZ) held a news conference to announce his intent to introduce legislation that would establish a newly created Tumacacori Highlands Wilderness Area in the Tumacacori Mountain Range of the Coronado National Forest. On August 1, 2007, Representative Grijalva introduced legislation (H.R. 3287) for the proposed wilderness. The proposed Wilderness would be located approximately 54 miles southwest of Tucson, Arizona, and would be comprised of approximately 70,000 acres in the Tumacacori Mountains. This proposal would expand the existing Pajarita Wilderness from 7,400 acres to 13,000 acres, including lands that abut the international boundary with the Republic of Mexico. Proponents of this legislation claim support from a variety of local, state, and national groups.

[9] Minimum Requirements Decision Guide. http://www.wilderness.net/index.cfm?fuse=MRDG

Cultural Resources

Issue: The amount of time and investment to interpretation of cultural resources

Trend Analysis 1986 through 2008

The amount of time and investment to interpretation of cultural resources was previously identified for cultural resources, along with two topics: (1) avoidance of damage to or loss of cultural resources through ground-disturbing activities, and (2) loss or damage to cultural resources through natural erosion or human vandalism.

Avoidance of Damage to or Loss of Cultural Resources through Ground-Disturbing Activities: Cultural resource compliance was relatively new in 1986 and basic procedures not known to all Coronado NF project managers. In the period from 1986 to 2008, relatively few cases of damage to or destruction of cultural resources through ground-disturbing activities was documented. No clear trend is evident from past monitoring; however, Coronado NF archeologists suggest the trend for frequency of damage incidents is downward. More incidents of damage by ground-disturbing activities occurred in the late 1980's and early 1990's than have occurred in recent years. One reason for this suggested downward trend is increased familiarity of Coronado NF personnel with basic cultural resource procedures for complying with the National Historic Preservation Act, specifically the use of archaeological survey prior to ground-disturbing activities to identify and avoid significant cultural resource sites. The majority of instances of damage by ground-disturbing activities in recent years have been by persons outside the agency, either members of the public or other agencies.

One theme throughout the monitoring period has been a relatively low level of post-project monitoring. Annual reports typically noted: (a) *"funding has been insufficient in many cases to conduct an adequate level of inspection and to document the results,"* and (b) that a more effective monitoring program *"will be increasingly important, not only for revision of the Forest Plan, but also to be responsive to the Native American tribes with whom the Forest consults under the National Historic Preservation Act."*

Loss or Damage to Cultural Resources through Natural Erosion or Human Vandalism: No obvious trend is expressed in the documented annual summaries for this topic. Nevertheless, the personal familiarity of the Coronado NF archeologists with program implementation suggests there is a slight downward trend in the period from 1986 to 2008, and a stronger downward trend when compared with the period prior to 1986.

"Natural erosion" seems to have been a greater concern in 1986 than now. Several archaeological sites that were experiencing damage through active erosion at that time appear less threatened now. Factors involved in the suggested downward trend include: (a) the implementation of site stabilization measures in a number of cases, and (b) a perceived improvement in overall rangeland conditions with fewer damaging active erosion conditions, at least partially attributable to favorable management practices.

Alternatively, one notable upward trend has been from damage caused by major wildland fires and subsequent associated major runoff events along stream channels draining fire-affected watersheds. The mid-1990's initiation of larger and more catastrophic wildland fires had an increased effect on cultural resources. This trend is expected to continue.

Regarding human vandalism, there is a slight, but still ambiguous, downward trend since 1986. Acts of looting and other vandalism have occurred throughout the period but with relatively low frequencies, especially in comparison with other areas in the Southwest. The few major archaeological sites that have been the targets of repeated looting have been subject to less damage in recent years than previously. Reasons for this reduction in looting and vandalism are thought to be partially attributable to more effective protection measures. Implementation of public volunteer programs such as the Arizona Site Stewards and Forest Service Passport-in-Time Program[10] have lead to increased site monitoring and site protection activities. In addition, there is a perceived region-wide change in public behavior whereby major looting at archaeological sites has become less appealing or deemed less acceptable than it was in the period from 1970 to 1980. However, due to increasing populations near National Forest System lands, acts of vandalism to cultural resource sites are expected to continue.

Need for Change Recommendation

The single issue identified in 1986 has changed as the passage of time led to a change in focus. Many of the cultural resource issues that involved substantial time and energy in 2008 were not identified in 1986. The 1986 issue, "the amount of time and investment to interpretation of cultural resources," appears to be too limited in scope and unrelated to the two topics listed, which include nothing about interpretation. The issue of interpretation and investment of time and money is worth developing further. A more comprehensive issue would focus on the management of cultural resources, including the aspects of identification, protection, and interpretation.

The topic, "loss or damage to cultural resources through natural erosion or human vandalism," could be better stated. As noted above, catastrophic wildland fire has become a greater threat in the past decade, but is not encompassed by an issue statement focusing on "natural erosion or human vandalism." Additionally, these older topics indicate a focus on threats to archaeological sites.

New Issues

There is a growing need to align Heritage and Cultural Resource program management focus to deal with the following aspects of the cultural resource program:

- Historic buildings, their preservation needs and costs, and the threats to them from fire and deterioration are important issues that need consideration
- Consultation and interaction with Native American tribes needs to address the several statutes, Executive Orders, and modifications to implementing regulations of existing statutes that have occurred in the past 20 years resulting in increased involvement with tribal governments

[10] http://www.passportintime.com/

Wildlife and Fish

Coronado Forest Plan Wildlife and Fish Issues

1. The amount of time to be given between threatened, endangered, or unique species; and other flora and fauna
2. Critical wildlife habitat must be identified, along with needed controls on other uses (mineral extraction, recreation, etc.)
3. Appropriateness of predator and rodent control, when and where
4. Fishing lakes which will be maintained and consideration of any new construction
5. Maintenance and improvement of the wildlife habitat for future generations in conjunction with other Forest activities

Issue 1: The amount of time to be given between threatened, endangered, or unique species; and other flora and fauna

Trend Analysis 1986 through 2007

The number of federally listed species has grown since the adoption of the 1986 Forest Plan. Additionally, a number of Forest Plan amendments have been adopted; all of which addressed wildlife, fish, or rare plants to some degree; increasing the complexity of implementing Forest Plan direction. Of particular note were standards and guidelines added to address habitat and population management for the Mount Graham red squirrel (*Tamiasciurus hudsonicus grahamensis*), Mexican spotted owl (*Strix occidentalis lucida*), and northern (Apache) goshawk (*Accipiter gentiles apache*).

In the late 1980s, extensive surveys of Mexican spotted owls were completed across the Coronado, providing accurate baseline information about the pairs found on-forest and their reproductive output. Protected Area Centers were established for the Mexican spotted owl. A similar emphasis was placed on surveying for and establishing habitat management areas for the northern (Apache) goshawk. Also in this time period, species management efforts were proactive as evidenced in program management related to a number of federally listed species. Efforts began on all of these organisms when they were proposed for federal listing, rather than only addressing conservation issues in response to Endangered Species Act compliance. Coronado NF biologists provided leadership for implementation of the Recovery Plan for the Mount Graham red squirrel, including inventories and follow-up monitoring. Forestwide surveys were also conducted for the cactus ferruginous pygmy-owl (*Glaucidium californicum*), Chiricahua leopard frog (*Rana chiricahuensis*), and lesser long-nosed bat (*Leptonycteris yerbabuenae*).

Similarly, the rare plants on the Coronado National Forest received more attention in the early period of Forest Plan implementation than they have in recent years. The Coronado National Forest hosts habitat for three (3) threatened and endangered plants, as well as about ninety (90) taxa listed on the Southwestern Regional Forester's (R3) Sensitive Species List. Through a cost-share agreement with the Nature Conservancy®, the Coronado NF botanist developed methods to increase understanding about the Coronado's rare plant resources and their habitat relationships resulting in analysis of field monitoring efforts, trend

identification, and recommendations for future monitoring, which were subsequently implemented. The three federally listed plants were the focus, but surveys were also conducted for plants that were under consideration for listing, as well as other rare plant species. Management Area 15 was created through a Forest Plan change notice process (Change Notice Number 3) establishing a Wild Chile Botanical Area for protection for wild chile (*Capsicum anuum*) plants.

One aspect of "other flora and fauna" referred to in this issue relates to publicly high-profile species that are favorites of hunters and anglers. A number of game species favored by hunters have received attention on the Coronado National Forest. Three (3) of these are species of quail that draw out-of-State hunters, especially the Montezuma (Mearn's) Quail (*Cyrtonyx montezumae*). Likewise, the desert bighorn sheep (*Ovis canadensis nelsoni*) of the Coronado National Forest have been the subject of much research and intensive management for decades. Extensive re-introduction efforts have been made to re-establish Gould's turkeys (*Meleagris gallopavo mexicana*) on the Coronado, and black bears (*Ursus americanus*) and mountain lions (*Felis concolor*) have received considerable attention due to human safety and property damage concerns.

Current understanding of conditions to support sustainability of flora and fauna is that some anthropogenic and natural effects on the environment have worsened and this trend is expected to continue. For example, global climate change, urbanization, and fire suppression have had profound effects on the natural environment. Terrestrially, grasslands, woodlands, and forests and their denizens are at risk from catastrophic events (severe wildfire, uncharacteristic insect outbreaks). The situation is worse on the aquatic front with severe droughts and loss of the water table. The outcome is that the Coronado National Forest is facing extirpations and extinctions that were not even considered in the 1986 Forest Plan.

The 1998 Monitoring and Evaluation Report only addressed some monitoring of five plant species, a very low number considering there are over 100 species of conservation concern identified in the various lists. In general, plant conservation concerns have been largely neglected, with the exception of federally listed species.

The 2001, 2002, 2003, and 2004 Monitoring and Evaluation Summaries were different, as they largely addressed the utility of the management indicator species selected for the Coronado National Forest. These summaries basically state that utility of the Coronado's management indicator species is limited. A current Forestwide Management Indicator Species Report is attached as Appendix B.

Trend Analysis 2008

There were no new threatened or endangered species added to the federal list during 2008. However, two species that occur on the Coronado were added as candidate species: The Arizona Treefrog and Mexican Gartersnake. The Arizona Treefrog is found on the Huachuca Ecosystem Management Area, in the Huachuca and Canelo Hills. It is only known from a handful of localities. One site, Scotia Canyon, is the site of a rare plant and wildlife restoration project, where effects of the project needed to be considered. The Mexican Gartersnake is also found in the area, and one individual was found in Scotia Canyon—the first in several years. It was formerly widespread in southeastern Arizona, but it has been extirpated from most of its former range and now is only known (on the Coronado) in the

Huachuca EMA. A project in the Canelo Hills (Redrock Canyon) also yielded a single individual. We have been on teams to decide how to deal with these species, even though they are not federally listed as threatened or endangered species yet. Talussnails and other land mollusks have been the subject of discussions in 2008, and a multiple-species conservation agreement is planned for 2009. No species were down-listed or de-listed in 2008. Several new Species-of-Concern and one new Species-of-Interest were added to those lists.

Need for Change Recommendation

The number of taxa listed as threatened or endangered will increase in the future based on trends in petitioning for federal listings. For example, all species listed as G1-G2 or T1-T2 (a global ranking systems on NatureServe™ and with each state's habitat data management systems) that occur on the Coronado National Forest have been petitioned for federal listing. This includes dozens of new species, mostly plants and invertebrates. In addition, each state was Congressionally-directed to make lists of Comprehensive Wildlife Conservation Strategy species to receive priority treatment. While this list includes threatened, endangered, and sensitive species, it also includes many not found on these existing lists. The Coronado must implement direction to integrate these lists into its Wildlife, Fish, and Rare Plants program. Also, the Regional Forester's Sensitive Species list was revised in Fall 2007, and the number of taxa remains high and includes many new taxa.

These anticipated future trends indicate that Issue 1 is still relevant, with perhaps a broader scope.

Issue 2: Critical wildlife habitat must be identified, along with needed controls on other uses (mineral extraction, recreation, etc.)

Trend Analysis 1986 through 2008

Note that the term "critical habitat" has a special meaning with regard to areas established by the USDI Fish and Wildlife Service for threatened and endangered species. For purposes of this review, the term is being used in a different context; it is used here to refer to areas that are important to species of conservation concern.

Since the 1986 Forest Plan was adopted, the Forest Service has changed its approach for addressing species needs in forest plans from a project-by-project approach to one that encompasses a more comprehensive strategy. This broader view is a foundational element of the ecosystem sustainability concept. While, there will still be a place for project-by-project evaluation for certain species, the majority of future forest planning will likely be undertaken using ecosystem sustainability concepts.

Aquatic wildlife resources are currently in a dire state of affairs. This is due in part to a drought that began around 1996 (still persisting, and likely to persist for an extended time), but also the affects of anthropogenic changes and demands of a burgeoning population. Since that time, little has been done to offset the widespread decline in native aquatic and semi-aquatic species.

Need for Change Recommendation

This issue still exists, but the issue statement is misleading because of alternate use of the term "critical habitat" by the USDI Fish and Wildlife Service.

Issue 3: Appropriateness of predator and rodent control, when and where

Trend Analysis 1986 through 2007

This issue is largely outside the authority of the Coronado National Forest. The Coronado is operating under a National Memorandum-of-Understanding between the Forest Service and State and Federal wildlife services. This is not to say that the Forest Service has no additional input. Each year, the participant agencies are supposed to meet and discuss plans for the upcoming year. The focus of these meetings have been almost entirely on livestock predation concerns, with the exception of black bear incident management and the 2004 Sabino Canyon mountain lion incidents and related management actions.

Trend Analysis 2008

A new, related issue, from a recent Memorandum-of-Understanding between Forest Service and Animal and Plant Health Inspection Service, Wildlife Services has developed. The MOU allows for the use of pesticides to control grasshoppers and Mormon crickets on public rangelands. This is problematic because pesticides are toxic to grasshoppers and other insects, some of which appear on lists of sensitive species. These toxins also threaten vertebrates through pollution, or entering the food chain, as with the decline of the American Peregrine Falcon. This has been added to a regional biologists meeting to address because it involves different programs (especially range and wildlife) and may cause conflicts between the programs.

Need for Change Recommendation

This issue is still relevant.

Issue 4: Fishing lakes which will be maintained and consideration of any new construction

Trend Analysis 1986 through 2008

Siltation of lakes on the Coronado continues to be a problem that has been exacerbated over time by increased sediment runoff following large, severe wildfires across the Coronado National Forest in recent years. Fishing lakes have proved to be problematic from a maintenance standpoint. Besides runoff, algal growth can be tremendous, and undesirable non-natives are an issue. Fishing lakes can be a source of undesirable non-natives, including bullfrogs (*Lithobates catesbeianus*), crayfish (*Orconectes spp.*), and certain warm-water fishes, all of which threaten native fauna. No new fishing lakes have been proposed.

Need for Change Recommendation

The retention of existing fishing lakes should be reassessed in the Forest Plan revision process. In 2008, Peña Blanca Lake was being drained as part of a CERCLA grant, to remove toxic waste in the lake and remove vegetation. This became a focal point for dealing with bullfrogs to allow native frogs to repatriate areas from where they were extirpated. This

was a good lesson to help show us that we can manage for both invasive and native species while dealing with desirable non-native species.

Issue 5: Maintenance and improvement of the wildlife habitat for future generations in conjunction with other Forest activities

Trend Analysis 1986 through 2008

Due to inadequate funding over the monitoring period, the Wildlife, Fisheries, and Rare Plants Program has played a supporting role to other program management needs, never reaching its potential to design projects to improve the welfare of wildlife, fisheries, and rare plants.

In recent years, the consequences of fire suppression and global climate change have manifested themselves to such an extent that many species are on the verge of extirpation or extinction (e.g., most aquatic species and the Mount Graham red squirrel). National and regional direction are addressing some of these issues (e.g., terrestrial fuel loads as the Southwest Region's central priority), but habitat for aquatic species are categorically low-priority, even though many taxa are most as risk. Many of these species were not even identified as species of conservation concern in the 1986 Forest Plan—indeed most verbiage addressed terrestrial species with much larger ranges.

Need for Change Recommendation

Carry this issue forward.

New Issues

While not necessarily new issues, the magnitude of concern for species and habitat conservation have, over the monitoring period increased dramatically. In some cases, issues have risen to the level of dire concern:

- Drought, anthropogenic changes, loss and draw-down of aquifers and water tables and other disturbance pressures from population increases in the Southwest have placed aquatic wildlife resources in a dire state with little being done to offset widespread decline in native aquatic and semi-aquatic species.
- Decades of fire suppression, exacerbated by global climate changes are manifesting to the extent that many species are on the verge of extirpation or extinction (e.g., most aquatic species and the Mount Graham red squirrel)
- Global climate change, urbanization, and fire suppression have had profound effects on the natural environment. Terrestrially, grasslands, woodlands, and forests and their denizens are at risk from catastrophic events (*e.g.* severe wildfire, uncharacteristic insect outbreaks).
- Plant conservation concerns have been largely neglected, with the exception of federally listed species.
- The utility of the Coronado's management indicator species is limited.
- Invasive, non-native species are one of the greatest threats to the sustainability of native species. While many of these are plants (traditionally, invasive plant issues have fallen under the Range Program; this should be reassessed, as invasive species

should be considered an ecological threat rather than strictly a threat to rangelands), there is also a burgeoning problem with invasive animals, including invertebrates and even game species.

- Appropriateness of introductions of flora and fauna that have not been documented for a specific site needs further assessment. For example, is it appropriate to introduce fishes in areas outside of their documented range as part of a recovery effort?
- Global climate change affects species conservation actions and mitigation practices.

Range

Coronado Forest Plan Range Issues

1. Manage Forest lands for grazing in relation to other uses
2. Where permitted use exceeds capacity, an appropriate combination of management changes and numbers adjustments must be determined. Scheduling of needed changes is also important.

Issue 1: Manage Forest lands for grazing in relation to other uses

Trend Analysis 1986 through 2008

Livestock grazing is balanced with other uses through decisions arising from environmental analysis pursuant to the National Environmental Policy Act (NEPA). All allotments currently being grazed on the Coronado National Forest are under a management plan – either an Allotment Management Plan (AMP) that was tiered off a completed NEPA decision document, an Annual Operating Instruction developed for a specific year, other planning document(s) if the allotment has yet to have NEPA completed, or a combination of the above. All of these documents are considered part of the grazing permit, which is required before commercial grazing occurs on National Forest System lands.

As individual environmental analyses are completed and AMPs are compiled or updated, other uses are considered and proposals are developed to alleviate or minimize conflicts with other land uses. Most allotments have a NEPA analysis completed, and the remaining ones are on schedule for completion in the next few years.

Once grazing NEPA is 10 years old, a review is made to determine if the existing NEPA decision is relevant to current conditions. If information supports the existing decision, grazing activities continue, if not further NEPA analysis is completed.

Need for Change Recommendation

No need for change in Forest Plan direction is recommended.

Issue 2: Where permitted use exceeds capacity, an appropriate combination of management changes and numbers adjustments must be determined. Scheduling of needed changes is also important.

Trend Analysis 1986 through 2008

As each grazing allotment undergoes an initial NEPA review, and the decisions from that review are re-visited every 10 years thereafter. Throughout implementation of the NEPA decision, data is gathered to determine if the permitted use is in balance with the estimated capacity developed in the NEPA review. If not, appropriate changes in management, including addition of range improvements or adjustments in numbers of animal units, are made to ensure balance.

Capacity overall on the Coronado National Forest is static or slightly increased due to improved range management techniques over the past 20 years, as well as additions to structural range improvements. In part due to ongoing drought conditions and changing demographics of the permittees, actual use tends to be less than capacity and this trend is expected to continue for the foreseeable future.

Need for Change Recommendation

No need for change in Forest Plan direction is recommended.

New Issues

No new issues were identified.

Timber and Forest Products

Coronado Forest Plan Timber and Forest Products Issues

1. Distribution of forest products between commercial users and personal use, and availability of permits to non-citizens
2. Timber harvest amount and objectives
3. Silvicultural systems and harvest techniques, including clearcutting, snag management, timber stand improvement, reforestation, and harvest of green or dead fuelwood

Issue 1: Distribution of forest products between commercial users and personal use, and availability of permits to non-citizens

Trend Analysis 1986 through 2008

Records indicate that the number of fuelwood permits and volume of wood sold began to increase beginning in 2002. Fuelwood permits are only sold for personal use. The limit of 1 or 2 cords of wood per permit was lifted. A limited number of permits is available annually; these permits are issued on a first-come basis.

Sawlog timber was salvaged from some wildfire areas in recent years as part of ongoing hazard tree removal efforts.

The demand for other forest products, such as beargrass, remains limited. All products remain available by permit to United States citizens and non-citizens alike. By far, the most permits go to people living in the United States.

Need for Change Recommendation

No need for change in Forest Plan direction is recommended.

Issue 2: Timber harvest amount and objectives

Trend Analysis 1986 through 2008

Vegetation manipulation tables for timber and fuelwood were removed by Change Notice 2, June, 1996.

The amount of growth has greatly surpassed the amount offered, but much of this net growth is located in areas that are not readily accessible for timber harvest. Harvest amounts have remained fairly static and well below the level of available volume described in the Forest Plan. This is in agreement with Forest Plan direction to, *"Continue a program that enhances other resource values, and that effectively utilizes the wood fiber produced. Carry out silvicultural practices to improve stand health when such practices are consistent with other resource objectives."*

Recent wildfires have altered much of the landscape, and project proposals designed to reduce fire hazards have increased in keeping with Forest Plan objectives.

Need for Change Recommendation

Monitoring of objectives for timber harvest completed for several timber and fuelwood sales throughout the Coronado indicates that the desired wildlife habitat emphasis for coniferous forest areas has been changing since the Forest Plan was developed. Concerns about retention of old growth ecosystems and habitat for species, such as the Mount Graham red squirrel, Mexican spotted owl, and goshawks remain high. For these reasons, as well as concerns about below cost timber sales, a re-evaluation of the suitability of lands to sustain a commercial timber sale program is needed.

The need for, and methods of, monitoring should be reassessed. The Forest Plan monitoring requirement to compare total cords made available to the projected output is not appropriate in light of program objectives, nor is this method of monitoring aligned with recent Forest Service policy to keep forest plans strategic and focused on outcomes rather than outputs.

Issue 3: Silvicultural systems and harvest techniques, including clearcutting, snag management, timber stand improvement, reforestation, and harvest of green or dead fuelwood

Trend Analysis 1986 through 2008

When the Forest Plan was approved in 1986, the acreage determined to be suitable for sustained timber harvest was 13,729 acres with an annual harvest estimated at 455,000 board feet. Objectives, standards, and guidelines for conducting timber sales were contained under Management Area 2. In 1989, the Forest Plan was amended (Amendment 4) to accommodate habitat needs for the Mount Graham red squirrel resulting in reductions of the suitable timber land base to 5,000 acres and an estimated annual harvest of 255,000 board feet.

Standards and guidelines for managing areas determined to be suitable for both timber and fuelwood harvests are found in the individual Management Area prescriptions. In addition, standards and guidelines for mitigating impacts of wood harvest on other resources are found in the Forestwide management prescription, as well as in individual Management Area prescriptions. Monitoring of specific fuelwood and timber sales since 1986 indicates these standards and guidelines are still valid, and are being appropriately supplemented on a project-by-project basis to meet management objectives for a specific area.

Vegetation manipulation tables for timber and fuelwood were removed from the Forest Plan in 1996 through Change Notice 2.

Changes in staffing and program management have improved the Coronado's ability to treat forest vegetation more effectively.

Need for Change Recommendation

The need for, and methods of, monitoring should be reassessed.

New Issues

No new issues were identified.

Plant and Animal Diversity

Coronado Forest Plan Plant and Animal Diversity Issues

1. Location and extent of vegetative manipulation
2. Selection of species for revegetation
3. Management of uses and management of practices in riparian areas

Issue 1: Location and extent of vegetative manipulation

Trend Analysis 1986 through 2008

There is insufficient data to establish a trend, but monitoring of projects indicates no need to modify current management practices.

Need for Change Recommendation

No need for change in Forest Plan direction is recommended

Issue 2: Selection of species for revegetation

Trend Analysis 1986 through 2008

There remains a continuing concern about the use of exotic or non-native plant species in revegetation projects. Forest Service preference is to use native species where practical and cost-effective in meeting desired management objectives; or to encourage natural seeding from established sources where feasible. The exception to these practices is the use of naturalized non-natives for restoration following catastrophic events (fire and flooding).

Need for Change Recommendation

No need for change in Forest Plan direction is recommended.

Issue 3: Management of uses and management of practices in riparian areas

Trend Analysis 1986 through 2008

Forestwide, riparian area channel stability as measured by bank protection, cross-section dimensions, and pebble counts has been steadily improving in response to improved range and recreation management. However, riparian areas have been observed to have declining canopy cover since 2003, apparently due to drought, and channel stability has declined downstream from each of the major wildfires experienced on the Coronado (2002 Bullock Fire, 2003 Aspen Fire, 2004 Nuttall Complex Fire, and 2005 Florida Fire). Observations of riparian areas downstream from the 1994 Rattlesnake Fire indicate that channel conditions altered due to wildfire in the watershed will improve with time under good management conditions.

Need for Change Recommendation

No need for change in Forest Plan direction is recommended.

New Issues

No new issues were identified.

Soil and Water

Issue 1: Management of Forest resources to protect or enhance watershed condition from both a hydrologic and soil productivity standpoint

Trend Analysis 1986 through 2008

Over the planning period, the 21 watershed boundaries originally delineated in 1986 were changed to the 50 watershed delineations in current use.

Assessment of upland conditions using the soil quality categories addressed in Forest Service Handbook 2509.18 has continued since 1999. A total of 1,131,230 acres have been assessed in the field and documented. Of these, 992,140 acres (88%) were found to have satisfactory soil quality.

The trend in soil condition and consequently overall watershed condition is up. The exceptions are locations where wildfire has severely burned an area, and where groundcover by plant basal area and vegetative litter is greatly reduced for 3 to 5 years. Most burned areas are recovering at the expected rate.

Need for Change Recommendation

The current method for evaluating watersheds has changed from only assessing vegetative groundcover to a combination of soil, aquatic, and riparian systems assessments. The method defined in the 1986 Forest Plan is now outdated, and the language needs to be changed to reflect new methodology.

New Issues

No new issues were identified.

Minerals

Issue: Identification of sensitive areas and formulation of recommendations for needed withdrawals from mineral entry

Trend Analysis 1986 through 2008

Several expiring mineral withdrawals were renewed during this period. Additionally, between 1987 and 1991, some new administrative withdrawals were established on the Coronado. These actions were taken in part due to Forest Plan direction specific to the withdrawn areas. Several new mineral withdrawals were proposed between 2001 and 2004, which are currently undergoing analysis. They include heritage sites, the Wild Chile Botanical Area (Management Area 15), several caves, and the Guidani Basin that drains into Kartchner Caverns.

Acts of Congress withdrew two additional areas, the Florida Administrative Site and the Cave Creek area. The latter, due to public opposition to mineral exploration, may have set a precedent for halting other exploration activity on the Coronado.

Rapidly rising metals prices resulted in new mineral exploration proposals in 2006 in the Dragoon and Patagonia Mountains. Most of the proposed exploration was for copper. In addition to copper drilling proposals, Augusta Resource Corporation submitted a preliminary proposal for an open-pit copper mine and support facilities to the Coronado in August 2006. The mining operation, known as the Rosemont Mine, would be located in the northeastern part of the Santa Rita Mountains and involves lands in both private and public ownership.

Other new minerals activity during the trend analysis period includes marble exploration and mining in the northern Dragoon Mountains and the northern Santa Rita Mountains.

Forest Service policy, as expressed in the Mining and Minerals Policy Act of 1970, is to *"foster and encourage private enterprise in the economic development of domestic resources, to help assure satisfaction of industrial, security, and environmental needs."* In carrying out this policy, the Coronado National Forest has provided for exploration activity in the Patagonia Mountains and for a proposed open-pit copper mine in the Santa Rita Mountains.

Mining proposals in both of these areas have raised strong opposition from local communities. Of particular note are the resolutions passed by the Pima County and Santa Cruz County Boards of Supervisors opposing mining in these two mountain ranges. Local governments have sought additional assistance from Congressional delegations to stop mining in these areas, specifically requesting that Congress withdraw the two mountain ranges from mineral entry. Furthermore, they have requested the Federal Government purchase the private land within which much of Augusta Resource Corporation's ore body lies.

Local communities have also opposed a proposed marble quarry expansion in the northern Dragoon Mountains following exploration to confirm additional marble resources in that

location. Opponents of the quarry development have requested that the Coronado take action to withdraw the area from mineral entry.

Need for Change Recommendation

No need for change in Forest Plan direction is recommended.

New Issues

No new issues were identified.

Lands and Special Uses

Coronado Forest Plan Lands and Special Uses Issues

1. Revision of land ownership adjustment plans to update lands desirable for acquisition and available for disposal
2. Allocation of national forest land for special uses such as commercial development, summer homes, utility corridors, scientific study sites, roads, apiary sites, ski areas, etc.
3. Management of national forest land for astrophysical research purposes on Mount Graham. (This issue and the specific concerns and opportunities related to it are being analyzed in a separate environmental impact statement.)

Issue 1: Revision of land ownership adjustment plans to update lands desirable for acquisition and available for disposal

Trend Analysis 1986 through 2008

Land ownership adjustments have been ongoing since the Forest Plan was adopted in 1986. The trend is for continuing land ownership adjustments.

Need for Change Recommendation

The revised Forest Plan should provide management direction that encourages resolving the dilemma of areas within the Coronado boundary becoming land-locked by management practices on surrounding land in other ownerships (lands in State and private ownership).

The revised Forest Plan should provide management direction that addresses additional land acquisition, particularly where acquisition increases administrative and public access or relieves the problem of National Forest System lands being land-locked by development on adjacent private land.

Issue 2: Allocation of national forest land for special uses such as commercial development, summer homes, utility corridors, scientific study sites, roads, apiary sites, ski areas, etc.

Trend Analysis 1986 through 2008

The Coronado has received requests for special use authorizations, mainly of the recreation type (outfitter/guide, recreation event, and research permits), since the Forest Plan was adopted in 1986. Requests for land use permits have increased somewhat concomitantly with population growth as private lands are developed and infrastructure needs (utility corridors) to service these developments increase. The Coronado has also experienced increases in requests for communication sites, primarily cellular telephone tower sites and infrastructure to support security needs along the international border with the Republic of Mexico.

Need for Change Recommendation

There is a need to increase use of authorities that provide additional funding for special uses through implementing cost recovery, particularly for lands special use permits.

Change is needed in the management of recreation special uses in light of the increasing trend for new permit requests. Additionally, funding strategies should be developed to address the need to undertake capacity studies of recreation, a process that could provide the documentation needed to evaluate additional permits in overused areas.

Issue 3: Management of national forest land for astrophysical research purposes on Mount Graham.

Trend Analysis 1986 through 2008

Forest Plan Amendment 4 revised management direction for the Pinaleno Mountains resulting from the environmental study and decisions for the Mount Graham Astrophysical Area. The Mount Graham International Observatory complex, located on Mount Graham in the Pinaleño Mountain Range, has been administered under a special use permit since adoption of those decisions. Challenges have occurred with administration, but for the most part the operation has stayed within the area designated by the 1988 Arizona/Idaho Conservation Act and approved in Amendment 4.

Need for Change Recommendation

No need for change in Forest Plan direction is recommended at this time.

New Issues

The Douglas Ranger District placed a moratorium on the issuance of new special use permits due to its inability to monitor use and evaluate impacts to high use area resources.

The amount of time to process special use requests has doubled or even tripled; budget allocations are insufficient to meet environmental review and processing needs for these requests.

Special Area Designations

Coronado Forest Plan Special Area Designations Issues

1. Management of land as zoological or botanical areas to protect biological uniqueness through modified management practices
2. Management of land and Research Natural Areas to provide opportunities for study of natural ecological processes in undisturbed areas

Issue 1: Management of land as zoological or botanical areas to protect biological uniqueness through modified management practices

Trend Analysis 1986 through 2008

The Wild Chile Botanical Area was established in 1999 through Forest Plan Change Notice 3 receiving the designation of Management Area 15 in the Forest Plan. The botanical area was established to protect the population of wild chiles, (*Capsicum annuum* var. *glabriusculum*), also known as "chiltepines." This species is also on the Southwestern Regional Forester's Sensitive Species List, along with its habitat in the Rock Corral Canyon area on the Nogales Ranger District.

Need for Change Recommendation

Additional special areas may be identified in the Forest Plan revision process.

Issue 2: Management of land and Research Natural Areas (RNA) to provide opportunities for study of natural ecological processes in undisturbed areas

Trend Analysis 1986 through 2008

There are six designated Research Natural Areas located on the Coronado National Forest. In the 1986 Forest Plan and a 1987 amendment to the Plan, an expansion of the Goodding RNA was recommended. An extension to the Pole Bridge RNA was also recommended in the 1986 Forest Plan. One additional area, Canelo, was proposed for designation and managed as a Research Natural Area, but has not been officially designated. All Research Natural Areas provide opportunities for non-manipulative research.

Need for Change Recommendation

There is a need to review and finalize the proposed extensions to the Goodding and Pole Bridge RNAs, and the proposed designation of the Canelo RNA.

New Issues

Additional potential RNAs may be identified in the Forest Plan revision process.

Protection

Coronado Forest Plan Protection Issues

1. Use of fire as a management tool including planned ignitions, prescribed natural fire, and management of wildfires
2. Appropriateness of suppression actions under varying conditions and locations

Issue 1: Use of fire as a management tool including planned ignitions, prescribed natural fire, and management of wildfires

Trend Analysis 1986 through 2008

The Forest Plan approved in 1986 reflected the Forest Service's fire management policy of its time, that is, suppression of all fires. Since the Forest Plan was approved, fire management policy has evolved. In August 2000, the Departments of Agriculture and Interior agreed on a National Fire Plan to govern interagency fire management. One component of the National Fire Plan is the 2001 Federal Wildland Fire Management Policy, which presents the option for agency managers to use wildland fire to achieve natural resource benefits in locations other than Wilderness, Wilderness Study Areas, and Research Natural Areas.

In 2005, the Forest Plan was amended (Amendment 11) to conform to the 2001 Federal Fire Policy and a Wildland Fire Policy allowing use of wildland fire for resource benefits on a Forestwide basis. Under this amendment, when a natural ignition occurs, an appropriate management response of either suppression or wildland fire use could be considered. This amendment changed management direction for goals and Forestwide standards and guidelines.

In 2008, the Wildland Fire Leadership Council agreed on modifying the guidance to the "Interagency Strategy for the Implementation of Federal Wildland Fire Management policy", contingent upon favorable counsel review. As a result of the review, it was determined that revising the Implementation Guidance would reduce confusion and provide a more flexible approach to wildland fire management. The revision allows fire managers to manage a fire for multiple objectives.

Need for Change Recommendation

When the revised policy implementation guidelines are finalized, the Forest Plan should be updated to reflect those guidelines.

Issue 2: Appropriateness of suppression actions under varying conditions and locations

Trend Analysis 1986 through 2008

Regulations at Section 7 of the Endangered Species Act of 1973 apply to appropriate management responses. The regulations for implementing the Act call for expedited consultation during fire emergencies. Section 7 regulations recognize that an emergency (natural disaster or other calamity) may require expedited consultation (50 CFR 402.05). This applies to both wildland fire use and suppression appropriate management responses.

Need for Change Recommendation

No additional changes are recommended.

New Issues

There is a need for change in the fuels management component of the Forest Plan. The following should be a guide to developing new management direction:

Fuels Management

- Losses of life are minimized, and firefighter injuries and damage to communities and the environment from severe, unplanned, and unwanted wildland fire are reduced
- Hazardous fuels are treated, using appropriate tools, to reduce the risk of unplanned and unwanted wildland fire to communities and to the environment
- Fire-adapted ecosystems are restored, rehabilitated, and maintained, using appropriate tools, in a manner that will provide sustainable environmental, social, and economic benefits
- Using prescribed fire and other fuels reduction tools to simultaneously meet long-term ecological, economic, and community objectives, actively provide for forest and rangeland management, including thinning that produces commercial or pre-commercial products, biomass removal, and utilization

Monitoring and Evaluation

- Establish a formal review process to monitor and evaluate performance, suggest revisions, and make necessary adaptations to the fire management strategy at all levels on a regular basis
- Integrate new information obtained from scientific research, as well as third-party review and analysis

Appropriate Tools

- Utilize methods for reducing hazardous fuels including prescribed fire, wildland fire use, and various mechanical methods such as crushing, tractor and hand piling, thinning (to produce commercial or pre-commercial products), and pruning
- Select methods on a site-specific basis that are ecologically appropriate and cost effective

Facilities (Roads and Trails)

Coronado Forest Plan Facilities (Roads and Trails) Issues

1. Need for adequate legal rights-of-way to allow public access to the national forest for all legal uses
2. Commitment of resources to construction and maintenance of an adequate system of roads and trails (including signing) for Forest users
3. Resolution of conflicts between trail users (hikers, horses, motorized vehicles)
4. Degree of public access to special use areas – involves a legitimate need to protect valuable improvements versus the public's right to access to public land

Issue 1: Need for adequate legal rights-of-way to allow public access to the national forest for all legal uses

Trend Analysis 1986 through 2008

The 1986 Forest Plan identified specific road and trail access points. However, it was vague with respect to specifying what steps were necessary to obtain permanent legal access.

The rapid growth of Arizona's population has led to a much greater demand for public access to National Forest System lands. At the same time, increased development of adjacent private lands has resulted in even greater restrictions to public access of these lands. Since the adoption of the 1986 Forest Plan, access has become an increasingly complicated problem due to blockage of access points to National Forest System lands by adjacent landowners and a reduction in the number of access points due to development on adjacent non-Forest lands.

For many years, private landowners informally permitted access via traditional travel routes across their land adjoining the Coronado National Forest. At that time, the Forest Service did not actively pursue legal access easements because landowners appeared willing to allow access through their property. Today, private landowners abutting the Coronado National Forest, especially those in the vicinity of the international border with the Republic of Mexico, are locking gates on their property that formerly allowed access to National Forest System lands. These formerly cooperative landowners must, in today's circumstances, place higher priority on addressing safety concerns associated with substantial increases in danger to their personal safety arising from the presence of drug smugglers carrying weapons, trash and human waste accumulations left in the wake of border crossings, and other illegal activities (car theft, home invasion, and drugs), to name a few. Illegal activities have also caused resource damage on and off National Forest System lands.

Due to traditional access points being blocked, National Forest System lands have, in some areas, essentially become National Forest "backyards" that provide exclusive or private access only to the adjacent landowners and their guests, without also providing benefit to the general public or access for administrative purposes.

Obtaining legal right-of-ways has taken years to complete in some cases. Many desirable access roads and trails identified in the 1986 Forest Plan still have not been obtained. Often, private landowners have not been willing to negotiate. Additionally, when negotiating with other government agencies, some projects have been delayed due to differing policies and regulations.

Only about one-third (approximately 100 of the 300) access points to the Coronado's approximately 1.2 million acres from outside its proclaimed boundaries have permanent legal access. In early 2005, a Forest Service position was staffed to assist with resolving priority public access needs.

Need for Change Recommendation

Emphasis and prioritization of Forestwide public access needs should be structured around public access needs to a particular area within or adjacent to a specific Ecosystem Management Area. Decisions regarding emphasis and priorities should consider the concerns expressed by adjacent landowners, advocacy groups, as well as local, State, or Federal agency support of or opposition to public access to the area rather than identifying a specific individual access point or road within or to an Ecosystem Management Area.

Flexibility, as well as a comprehensive, coordinated, and collaborative public access effort is central to resolving many of the Forest's public access needs. Partnerships, relationships, and agreements with Federal, State, and local agencies, third parties, interested organizations and publics, and private landowners are essential to providing adequate permanent legal public access to the Coronado National Forest. Opportunities to work directly with partners to support and resolve public access needs should be actively encouraged.

Forestwide public access needs should be given greater emphasis where there is support from landowners, advocacy groups, or local, State, or Federal agencies to protect public access points and routes, or to restore access points and routes to areas that have lost public access, especially where partners are willing to donate or acquire a right-of-way on behalf of the United States and/or relocate, reconstruct, or construct a permanent legal public access point and route that meets Forestwide public access needs.

Issue 2: Commitment of resources to construction and maintenance of an adequate system of roads and trails (including signing) for Forest users

Trend Analysis 1986 through 2008

Generally, the extent and location of roads and trails is adequate to meet Forest management goals and objectives. With few exceptions, there is relatively little need to construct new roads or trails. However, reconstruction and relocation of existing facilities is be needed. Large wildfires during the last 15 years have damaged many miles of trail and reconstruction of trails in these areas presents a continuing challenge. Overall, funding has not been adequate to maintain the existing trail system Forest-wide and some trails are in danger of being lost as a result.

Need for Change Recommendation

One of the most serious problems facing the Coronado National Forest and users of National Forest System lands in southeastern Arizona and southwestern New Mexico is the lack of permanent legal public access. The demand for a wide variety of uses of National Forest System lands is expected to continue to grow, generating issues and effects far more complex and controversial than in past years.

Future right-of-way acquisition, land ownership adjustment, and landline location program management efforts should focus on providing permanent legal public road and trail access to and within National Forest System lands, as well as precluding exclusive or private access to National Forest System roads, trails, or lands from adjoining private lands.

Issue 3: Resolution of conflicts between trail users (hikers, horses, motorized vehicles)

Trend Analysis 1986 through 2008

Resolution of road and trail use conflicts is decided on an area-by-area basis in light of the overall management direction for each Management Area. Public safety, protection of natural resources, and quality of the recreational experience are primary evaluation criteria. This normally results in one or more uses being eliminated or restricted for a given road or trail.

Need for Change Recommendation

There is a need to clarify forest plan direction on motorized uses on trails and to specify that trails are closed to motorized use unless specifically designated as motorized. This should be accomplished by amending the Forest Plan.

Issue 4: Degree of public access to special use areas – involves a legitimate need to protect valuable improvements versus the public's right to access to public land

Trend Analysis 1986 through 2008

The extent of public access to areas under special use authorizations is decided on a case-by-case basis. Permitted use varies. To alleviate safety or resource concerns, or to address other policy restrictions use in some areas may be restricted only to Forest Service personnel and permittees.

Need for Change Recommendation

No change needed at this time; however, once capacity studies for special uses are completed their results may limit the number of permittees authorized in certain areas. Restrictions to special use permit access will continue to vary across the Forest.

New Issues

Of particular concern are access challenges complicated by management of the international border with the Republic of Mexico – the current magnitude of these challenges could not be foreseen by the designers of the 1986 Forest Plan, and therefore the current Forest Plan contains no management direction specific to these needs.

Law Enforcement

Issue 1: Degree of regulation of Forest users and identification of areas needing more intensive enforcement efforts

Trend Analysis 1986 through 2008

The primary law enforcement needs identified in the 1986 Forest Plan were for protection of Forest resources and Forest users. Since then, law enforcement priorities have expanded in response to several factors: (a) increasing population and urbanization in areas adjacent to National Forest System lands; (b) use of National Forest System lands for illicit drug activities; (c) proximity of the international boundary with the Republic of Mexico; and (d) increasing off-highway vehicle use.

The breadth of issues faced by law enforcement officers prompted a temporary increase in staffing level and training, supported by allocations for controlled substance enforcement. However, position reductions beginning in 1990 have rendered law enforcement officers unable to effectively support Coronado National Forest needs. Cooperative agreements with county, State, and Federal agencies have produced increased enforcement efficiency, but are not sufficient to compensate for reduced law enforcement presence.

Law Enforcement and Investigations, Washington Office, is the funding source for Forest Service law enforcement activity, with the exception of Forest Protection Officers who are funded by the Coronado National Forest. Consequently, staffing decisions are generally beyond the control of the Coronado National Forest.

In response to the exponential rise in law enforcement issues related to the Coronado National Forest's contiguous international border with the Republic of Mexico, the Forest Service and other Federal land management agencies in the States of Arizona and New Mexico jointly developed a coordinated strategic plan with the U.S. Department of Homeland Security, Customs and Border Patrol Agency that provides for increased patrols, road maintenance and improvement, vehicle barriers, and acquisition of all-terrain vehicles for use in border-related law enforcement activities.

Need for Change Recommendation

The revised Forest Plan should incorporate, to the greatest extent possible, the recommendations of the Border Strategy Plan jointly developed with the U.S. Border Patrol, especially those recommendations that facilitate increased funding to meet law enforcement needs, visitor and employee safety, and protection of Coronado National Forest lands and resources.

New Issues

New issues include:

- Illegal immigration resulting in wildfire, property damage, illegal occupancy, visiting public and employee safety-hazards, and drug trafficking
- Forest resource damage from illegal vehicle use
- Alcohol use and possession and use of illegal substances
- Unauthorized occupancy and use

Forest Plan Management Direction

Trend Analysis 1986 through 2008

Through time, the 1986 Forest Plan has been adapted to meet changed circumstances, direction, and evolving Forest Service policy. Adaptations have been in the form of incorporation of three (3) change notices and the adoption of eleven (11) amendments. The overall trend in amendments was to remove text that implied site-specific decisions, and to provide for additions to management direction (standards and guidelines), mainly in the form of Regionwide amendments for protection of Mexican spotted owl and northern goshawk. In addition, several new management areas were defined and fire management direction was modified to provide for consistency with national policy.

Need for Change Recommendation

Current Forest Plan components include: (a) management direction in the forms of goals, objectives, standards, and guidelines; (b) management area direction (includes management emphasis and intensity, capability area types, management area description, management practices and activities, and standards and guidelines), (c) monitoring, and (d) special area designations.

The Forest Plan revision should incorporate updated plan components that are consistent with the governing regulation. Any management direction that is not consistent with the governing regulation, and that cannot be updated for consistency, should be removed. New direction should be incorporated as appropriate. As part of the Forest Plan revision process, all Forest Plan management direction should be reviewed for relevance, usefulness, and consistency with the governing planning regulations.

New Issues

In the time since the 1986 Forest Plan was adopted, Forest Service policy and procedures have been evolving and, in some cases are being shaped by forces outside Forest Service control, including changes in statutes, regulations, Executive Orders, and judicial oversight in the form of rulings, orders, and case law. Procedures and processes for analyzing land and resource use and management and developing documentation for forest planning are all, at times, affected by this evolution and change.

Outputs

Trend Analysis 1986 through 2008

Management direction in the 1986 Forest Plan, in many cases identified schedules of outputs for goods and services derived from management of Coronado National Forest lands and resources. Through time, most of these output schedules proved unrealistic from an implementation feasibility or funding standpoint and were removed from the Forest Plan through change notices and amendments.

Need for Change Recommendation

The Forest Plan revision should incorporate updated management direction consistent with the governing regulation. As part of the Forest Plan revision process, all Forest Plan management direction regarding the scheduling of production outputs should be reviewed for relevance, usefulness, and consistency with the governing planning regulations.

New Issues

In the time since the 1986 Forest Plan was adopted, Forest Service policy and procedures have been evolving and, in some cases are being shaped by forces outside Forest Service control, including changes in statutes, regulations, Executive Orders, and judicial oversight in the form of rulings, orders, and case law. Procedures and processes for analyzing land and resource use and management including whether or not to emphasize the production of outputs are all, at times, affected by this evolution and change.

Insect and Disease Management

Trend Analysis 1986 through 2008

This discussion includes information available for the period of scientific record regarding insect activity on the Coronado National Forest. Over the period of record, pine bark beetles have affected the greatest area, and insect damage has been most severe in the spruce-fir type. Bark beetle activity in the pine type has been at endemic levels, affecting up to 36,000 acres at a time, except during the 1950s and the 2000s droughts. Bark beetle activity in the mixed-conifer appears to be episodic as well, with damage in the 1950s and late 1990s through the early 2000s. More acreage was damaged in the early episode than in recent years, and it is not clear if the bark beetle activity in the mixed-conifer is associated with drought or other factors. Insect activity in the spruce-fir type has been unusual in recent years in the multitude of species incurring outbreaks and in the severity of damage. The recent insect activity in the spruce-fir vegetation types is associated with warm temperature patterns. Recent damage to aspen is unprecedented in the record. Compared to insect activity associated with the 1950s drought period, contemporary insect activity has occurred on a comparable acreage, been similar in severity in the pine and mixed-conifer vegetation types, been much more severe in the spruce-fir, and has involved more species of insects, some with potentially more aggressive population dynamics. These differences may be due to the condition of the contemporary forest, warming climate, the temporal coincidence of drought with warmer temperatures, and the introduction of an exotic.

Insect activity reported in Conditions Reports is based mostly on aerial detection surveys flown annually in July and August; it can be difficult to distinguish damage from different insects that cause similar types of damage on the same tree species. The sky island forests are particularly difficult to survey because optimal timing coincides with monsoonal storms, particularly in the highest elevation forests. The Forest Entomologist has expressed concern that recent insect activity in the pine types of the sky island forests has been underestimated because at such low latitudes, damage is more visible earlier in the year, and therefore it is difficult to distinguish between current year's damage and older damage.

Associations with Climate

A small outbreak of roundheaded pine beetle in ponderosa pine and Southwestern white pine in the early 1990s does not appear to be drought related, but the pockets of beetle activity began developing in 1988 and 1989, which were dry. Later damage in the late 1990s and early 2000s is drought-associated bark beetle activity, and coincides with the regional trend at that time. Insect activity in the mixed-conifer type does not appear to be either clearly associated with or independent of drought. Drought alone is not known to initiate Douglas-fir beetle outbreaks; however, Douglas-fir beetle activity on the Coronado National Forest coincides with similar Region-wide trends possibly indicating a climatic factor is involved. Outbreaks of fir engraver are known to be associated with most stress agents, including drought and windthrow. The various insect species that incurred recent outbreaks in the Pinaleño spruce-fir ecosystem have outbreak dynamics that are known to be associated with periods of warm temperature.

Need for Change Recommendation

The concept of climate change was not considered in the 1986 Forest Plan. However, even in the face of uncertainty regarding future climate and insect activity, general management recommendations for reducing susceptibility and vulnerability to insect outbreaks remain the same: Improve tree vigor and maintain forest health by maintaining natural species, size, and age class distributions.

The aerial detection surveys, from which the conditions reports are compiled, map activity each year. Some of the same acres may be mapped in consecutive years for the same damage agent, usually indicating that the insect outbreak attacks more trees on the same sites in subsequent years, as well as the outbreak expanding to additional areas. A geospatial mapping based analysis would account for some of this overlap, but maps are not available for the entire record. Such maps should be compiled.

A survey conducted earlier in the season might detect additional pine bark beetle activity. The timing of pine tree crown fading should be investigated to determine if the historic time frame is best for insect detection surveys in southern Arizona.

New Issues

It would not be prudent to expect the next 10 or 20 years to be similar to the 1970s and 1980s with regard to insect activity. Contemporary trends have enough differences from historic trends to anticipate altered ecosystem processes. The coincidental occurrence of competitive vegetation densities, drought, and warm climate has increased forest vulnerability to herbivorous insects, especially bark beetles. There is potential for catastrophic insect outbreaks in the pine and mixed-conifer forests, but it is difficult to characterize the risks in a temporal framework. There is more uncertainty regarding future insect outbreaks than the past record indicates.

Appendix A – List of Preparers

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Appendix B - Management Indicator Species

Item Monitored:
Population & habitat trends for Management Indicator Species

Monitoring Method:
A total of 33 management indicator species and one group (cavity nesters) are included in the Coronado National Forest Land and Resource Management Plan (Forest Plan, USDA-FS 1986). Of these, only eight species are specifically identified in the monitoring methods section of the Forest Plan (Appendix 1 of the Forest Plan). Monitoring methods for the identified species are described in the species-by-species analyses below. The plan indicates that monitoring of MIS will generally be accomplished using third party data, especially Arizona Game and Fish Department (AGFD) survey data. The bulk of costs noted for MIS monitoring were identified for research into the population/habitat relationships for MIS and for basic distribution information. Since the Forest Plan was adopted, the CNF has supported numerous studies and management actions aimed at achieving these objectives. These are described in the Coronado National Forest Report of MIS status and trends (USDA-FS 2006).

Data on the trends of other MIS on the Forest are collected and reported in the Forest's report of MIS population status and trends (USDA-FS 2006) which is posted on the Forest's web site. Results reported below are for species specifically identified in Appendix 1 of the Forest Plan.

Results:
Monitoring activities and population and habitat trends are reported below by species.

White-tailed Deer

White-tailed deer is included in the Species Needing Diversity, Species Needing Herbaceous Cover and Game Species indicator groups.

Monitoring method. Sex and age (NMGF, AGF using aerial, horse and foot transects). Also hunter kill information.

Results. White-tailed deer are surveyed and data are compiled on the basis of game management units in Arizona and New Mexico. The majority of white-tailed deer habitat in southeast Arizona is found on the Coronado National Forest (CNF), but substantial numbers of whitetails occur off of the Forest. Data from the 2008-2009 white-tailed deer survey conducted by Arizona Game and Fish Department (AGFD) are shown in Table 1. Survey and harvest trends for game management units included within the CNF are shown in Figures 1 and 2.

Table 1. White-tailed deer survey and hunt success: 2008-2009.

Management Unit	Bucks:100 does:Fawns	Hunt Success
29	21:100:13	23
30A	46:100:28	31
30B	31:100:34	25
31	22:100:19	29
32	24:100:23	31
33	20:100:34	38
34A	28:100:36	27
34B	25:100:20	18
35A	41:100:50	24
35B	43:100:37	28
36B	24:100:51	25
Total/Average	30:100:31	27.18

Figure 1. White-tailed deer harvest trends: 1982-2008. Source: J. Heffelfinger, AGFD, unpublished.

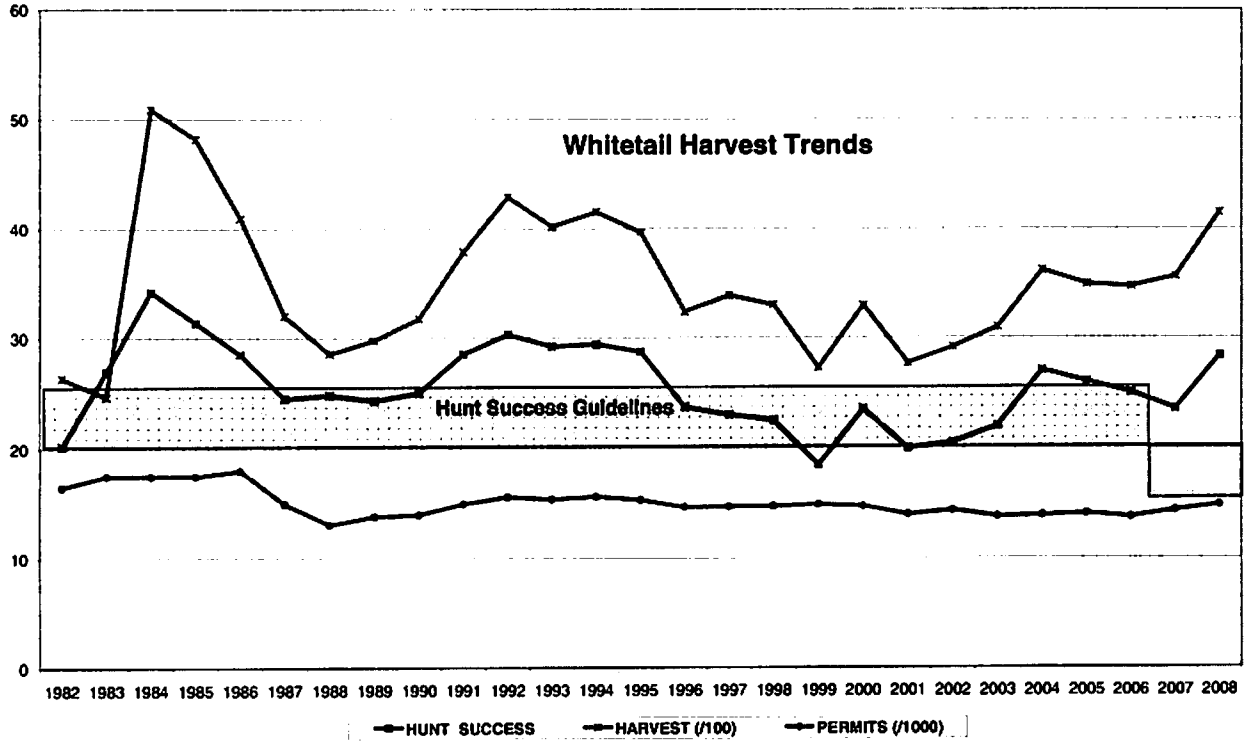
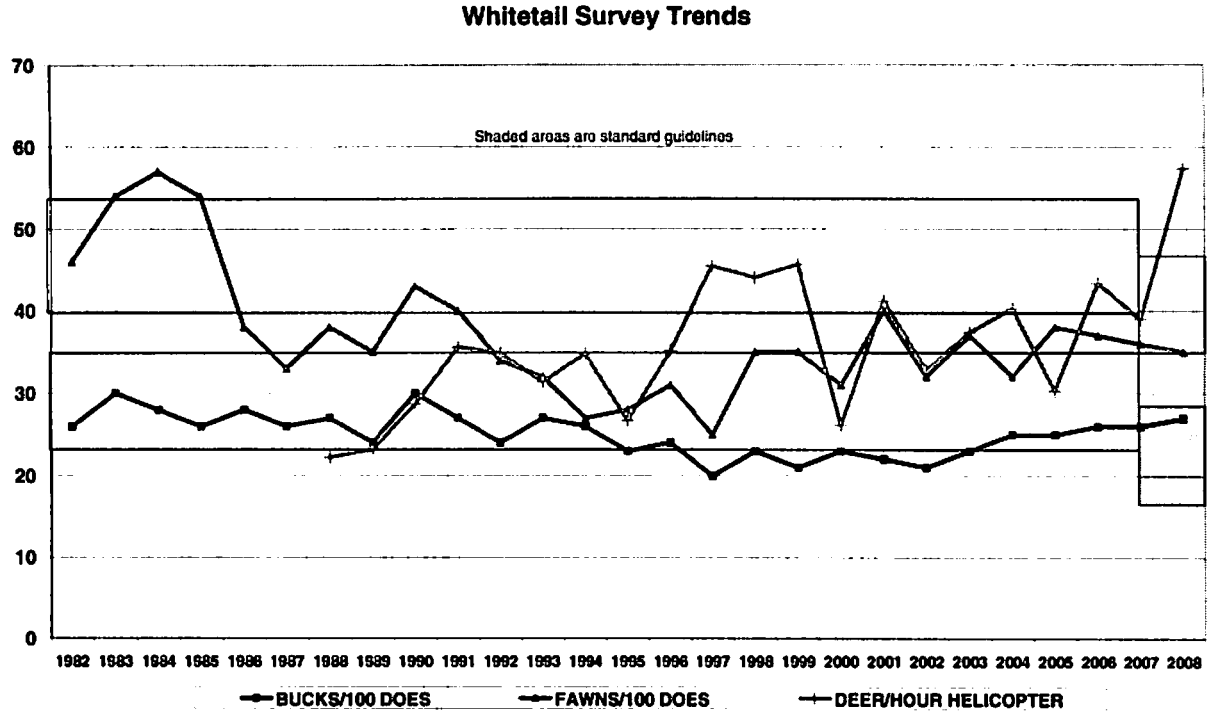


Figure 2. White-tailed deer survey trends: 1982-2008. Source: J. Heffelfinger, AGFD, unpublished.



Evaluation. Between 1986 and 1996, fawn survival declined somewhat throughout southeastern Arizona. However, white-tailed deer populations in 1986 were at near record high levels and probably above the long-term carrying capacity of the habitat. Since the mid-1990s, fawn survival has averaged approximately 35%, which is considered sufficient by AGFD to maintain population levels. Harvest levels are currently at or slightly above guidelines set by AGFD. White-tailed deer habitat on the CNF is of sufficient quality, distribution and abundance to allow the species to be well distributed across the Forest lands. Fawn survival data indicate that recruitment is sufficient to compensate for natural and hunting mortality and to provide recreational hunting opportunity for nearly 15,000 hunters annually.

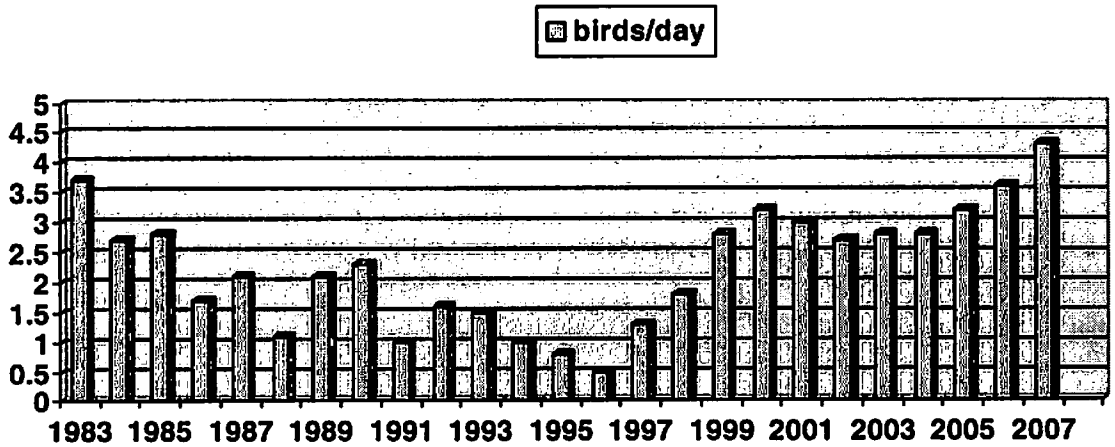
Mearns' Quail

Mearns' quail are included in the Species Needing Herbaceous Cover, Game Species and Special Interest Species indicator groups.

Monitoring method. Population trend data from hunter wing barrel returns.

Results. Since 1981, the AGFD has collected Mearns' quail wings from hunters to analyze trends in harvest. These data are displayed in Figure 3.

Figure 3. Mearns' Quail harvest Data: 1983-2007.



For the 2007-2008 quail season, the overall average birds per day was 4.3, which is the highest since records have been kept. Harvests have fluctuated widely over 20 years, but have been trending upward since 1996. Harvests currently exceed the levels seen in 1986 when the Forest Plan was adopted.

Evaluation. Mearns' quail population fluctuations are highly correlated with two things: the amount and timing of summer precipitation and the presence of suitable cover. Populations can fluctuate dramatically from year to year in response to rainfall, but are capable of rapid recovery provided suitable habitat is available. Harvest data typically correlate well to population trends but are also influenced by other factors. For example, the AGFD heavily marketed Mearns' quail hunting opportunities during the 2000 season, which may have increased participation. Range management emphasis on lighter utilization levels and winter use likely also benefits cover retention.

The Forest completed NEPA analysis for all range allotments on the Forest in 2009. Prescribed utilization levels are consistent with Forest Plan direction for Mearns' Quail across the Forest. This appears to contribute to improved habitat conditions for the species across the Forest; however, populations will continue to fluctuate in response to precipitation patterns regardless of management actions. Mearns' quail habitats are of sufficient quality, distribution and abundance to allow the species to be well distributed across the forest and to provide for a sustained annual harvest.

Pronghorn Antelope

Pronghorn is included in the Species Needing Herbaceous Cover and Game Species indicator groups.

Monitoring method. Sex and age ratios from AGFD and hunter kill information.

Results. Pronghorn antelope inhabit the Sulphur Springs and San Rafael Valleys and the Canelo grasslands within Game Management Units 35A and 35B. The Arizona Game and Fish Department conducts surveys for pronghorn on an annual basis. Units 35A and 35B include everything south of State Highway 82, west of the San Pedro River, and north of the Mexican border. Harvest and permit numbers for Unit 35A and 35B are presented in Figure 4, below.

Figure 4. Permit numbers and harvest for pronghorn in Wildlife Management Units 35A and 35B, 1991 to 2000 and 2003 to 2007. (from: AGFD 2008).

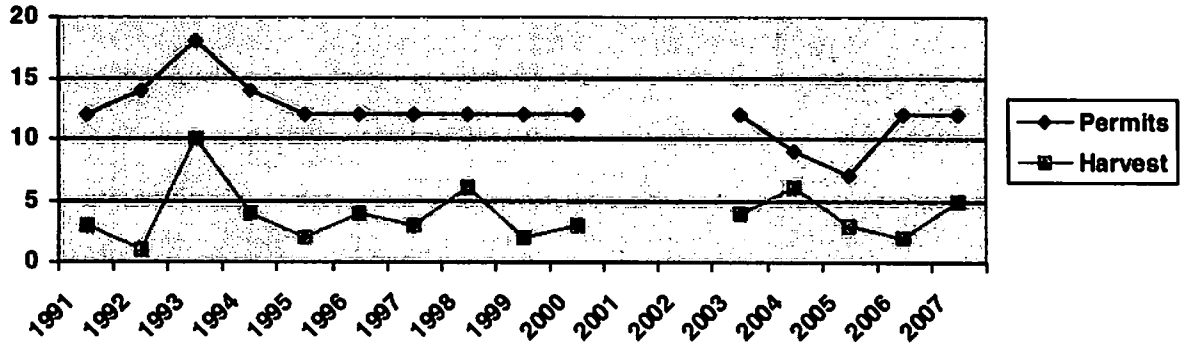
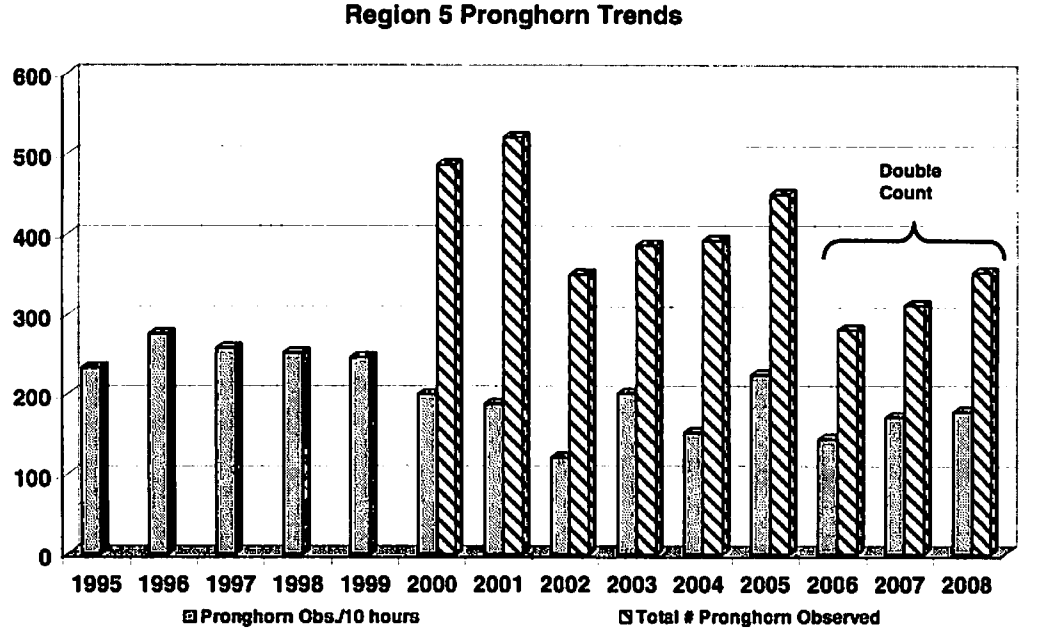


Figure 5. Arizona Game and Fish Department Pronghorn survey trends: 1995-2008. From: AGFD 2009 hunt recommendations (J. Heffelfinger, personal communication).



Evaluation. Pronghorn populations in southeastern Arizona are centered off of the Forest and Forest lands are considered secondary habitats. In general, habitat on the Forest is not of

sufficient extent to support a population of pronghorn without adjacent private or state parcels. This situation tends to mask the effects of Forest management on the species. Not enough information is available to determine trends on the Forest. Pronghorn populations in southeastern Arizona were considered to be stable or slightly increasing through much of the 1990's. Recent poor fawn recruitment is thought to be causing a slight decline in total numbers. Numbers of animals in the San Rafael Valley herd have been declining over the past several years. Causes include periodic drought, possible poaching in nearby Mexico, and past over utilization of forage by livestock in other portions of the San Rafael Valley. Land development and fence locations may be limiting the distribution of animals in the Elgin herd, also.

Merriams Turkey

Merriam's turkey is included in the Species Needing Diversity and the Game Species indicator groups.

Monitoring method: Hunter kill information.

Results. The native turkey population on the CNF was thought to have been extirpated during the early 1900's. While no taxanomical records exist, it is likely that these birds were the Gould's subspecies (Meleagris gallopav. mexicana) based on the proximity to and connectivity between existing Gould's turkey habitats in northern Mexico and mountain ranges on the CNF. Starting in the mid-1920's and continuing through the mid-1950's, Merriam's turkey were aggressively restocked into mountain ranges in southeastern Arizona. Although the transplant appeared to be initially successful, over time each of these transplanted populations declined. Accounts from the 1970's indicated that translocated populations had been reduced to only a few birds (Heffelfinger et al 2000). Merriam's turkeys were hunted on the CNF from the 1940's until the mid-1990's. The last turkey harvested in the Santa Catalina Mountains was in 1994, the last kill reported from the Chiricahua Mountains in 1995. There have been no turkey hunts since 1997 in the CNF. Consequently, no harvest data are available for analysis.

Evaluation. Merriam's turkey no longer occurs on the CNF. However, Merriam's turkeys are likely not endemic to the Forest and recent efforts have been focused on the restoration of the native Gould's subspecies. These efforts have been successful and turkeys are now present throughout several mountain ranges on the forest.

Coppery-tailed (Elegant) Trogon

Identified as the Coppery-tailed trogon in the Forest Plan, this species is included in the Cavity Nesters, Riparian Species, Species Needing Diversity and the Special Interest Species indicator groups.

Monitoring methods: Sex and age ratios from private cooperators and wildlife biologists using foot transects.

Results. Annual trogon surveys are accomplished in the Chiricahua Mountains. The number of pairs observed averages under 10 with no discernable trend. The most recent Forest-wide survey data comes from Hall (1996) who studied trogons in all four mountain ranges in which they occur on the Forest. A comparison of her data with similar forest-wide data collected by Taylor between 1977 and 1982 is shown in Table 2.

Table 2. Average number of trogons in 4 mountain ranges on the Coronado National Forest for 2 periods: 1977-1982 and 1993-1995 (Hall 1996).

Mountain Range	77-82 Average	93-95 Average
Atascosas	9	6
Chiricahuas	22	9
Huachucas	20	46
Santa Ritas	16	17
Totals	67	78

Evaluation. Because of the patchy nature of their preferred habitat, trogons will never be well distributed across the forest. However, habitats are of sufficient quality and abundance to allow the species to persist in all historic habitats.

Within the CNF, the species is limited in distribution by its selectivity for a certain riparian habitat type, which is itself limited to a handful of canyons on the Forest. The existing data indicate that populations have fluctuated somewhat within individual canyons, but that overall populations are apparently stable. Elegant trogon populations appear to have remained viable over the past 20 years within suitable habitats and monitoring has been sufficient to quantify annual populations, but no trends are discernable.

Gila Topminnow

Gila topminnow is included in the Threatened and Endangered Species indicator group in the Forest Plan.

Monitoring method: Number of miles of occupied habitat (USFWS, AGFD using foot transects).

Results. Once one of the most widespread fish in southern Arizona, Gila topminnows have declined to only 12 naturally occurring populations (AGFD 2001). Occupied habitat for Gila topminnow on the CNF is restricted to Redrock Canyon on the Sierra vista Ranger District. Aquatic habitats in Redrock Canyon have been extensively monitored (Stefferud 2001, Stefferud and Stefferud 2004, USDA Forest Service 2008). These surveys were repeated in 2008 by the Forest (USDA Forest Service 2008). The reports document dramatic improvements in riparian condition that have occurred in Redrock Canyon since 1989 as a result of changes in Forest land management practices, primarily livestock exclusion.

Riparian vegetation and the extent of surface water have both increased since 1989, creating additional habitat for Gila topminnow.

Evaluation. While this habitat has apparently improved and expanded since 1986, there remain significant gaps in the historic distribution of the species. The decline of the species appears related to the presence of non-native fishes and bullfrogs which compete with or prey on topminnows. The extent of suitable habitats appears to be increasing, but the occupied habitats have been reduced. The Forest is currently coordinating with the Arizona Game and Fish Department, the US Bureau of Reclamation and the US Fish and Wildlife Service to remove non-native fishes and bullfrogs from the creek. Threats to the species remain because of the fish's limited distribution on the Forest. The Forest is also coordinating with AGFD and USFWS to re-establish a topminnow population in Sabino Creek in the Santa Catalina Mountains. Once completed, this effort would significantly expand the amount of occupied habitat on the CNF.

Black Bear

Black bear is included in the Riparian Species, Species Needing Diversity and the Game Species indicator groups.

Monitoring methods: Recording sign, hunter kill information, depredation reports and campground problems.

Results. Because of their secretive nature and affinity for dense cover, black bears are extremely difficult to census. No organized surveys are conducted on the CNF. AGFD estimates populations based on qualitative analyses of habitat carrying capacity. Hunt structures are generally conservative with a statewide annual harvest target of no more than 125 females and a total of 250 or more bears. Recent black bear harvest data for game management units within the Coronado National Forest are displayed in table 3.

Table 3. Black Bear harvest data from southeast Arizona: 1995-2007.

	Management Unit						
Year	29	31	32	33	34A	35A	Total
1995	8	7	2				17
1996	1	7	3	3	1	1	16
1997	23	8	7				38
1998	4	7	1				12
1999	15	27	5			1	47
2000	13	23	16		1		53
2001							
2002							
2003	18	8	6		1	5	38
2004	9	6	5		2	1	23
2005	6	7	3	1	2	1	20

	Management Unit						
2006	16	7	9	2	4	15	53
2007	12	8	7	1	8	5	41

An additional number of bears are annually captured and moved or killed as nuisance bears in southeastern Arizona. Many of these animals are presumed to have originated on the CNF. Bear management activities on the CNF have focused on reducing bear-human interactions through installation of bear proof trash containers and food boxes throughout the Forest.

Evaluation. Black bears are highly adaptable generalists and are not highly correlated with a particular habitat except for dense cover in the 1-6 foot height class. Across the Forest, this type of cover is of sufficient quality and abundance to allow the species to be well distributed. Populations are primarily influenced by annual rainfall and by sport hunting or depredation removal. The limited information available on annual harvest provides little insight into habitat conditions.

No discernable population trends can be detected, although it is generally believed that poor mast crops lead to a decrease in the carrying capacity for bears on the Forest. This has been evidenced by an increase in nuisance bear interactions both on and off of the forest following dry winters. This is part of a long-term cycle in populations related to climate and is not influenced to any degree by management.

Desert Bighorn Sheep

Desert bighorn sheep are listed in the Game Species and Threatened and Endangered Species groups in the Forest Plan. Bighorn were endemic to the Pusch Ridge Wilderness Area (PRWA) of the Santa Catalina Mountains.

Results. No monitoring activities were accomplished during the year. Over the past decade, the Forest has supported research into the effects of human recreation on bighorn in the PRWA (Harris 1992, Schoenecker 1997, and others) and public attitudes toward wildlife (Devers 1999). The AGFD continued to fly helicopter surveys until 1997 when they were discontinued due to a lack of observations.

Evaluation. No bighorn observations have been confirmed since 2001, although unconfirmed sightings are occasionally reported. Based on research supported by the Forest, it appears that a combination of urban encroachment, recreational disturbance, habitat fragmentation and predation are to blame for the decline of this population. In 1996, the forest closed the PRWA to off-trail hiking and to dogs in an effort to minimize known disturbances to bighorn. This closure remains in effect. The Forest and AGFD are currently focusing efforts on plans for an experimental release of bighorn back into the PRWA in the future. A more complete evaluation of the species as a MIS is included in the Forest-wide analysis of MIS population status and trends.

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