

U.S. Department of the Interior  
**Bureau of Land Management**

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Environmental Assessment  
DOI-BLM-AZ-P010-2016-0008-EA

PROPOSED GRAZING PERMIT RENEWAL FOR  
**Eagle Eye Allotment #3027**  
**6Y Ranch Lease Allotment #5042**  
**Christopherson Allotment #5025**

MARICOPA COUNTY, ARIZONA

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# **Chapter 1 – Purpose and Need**

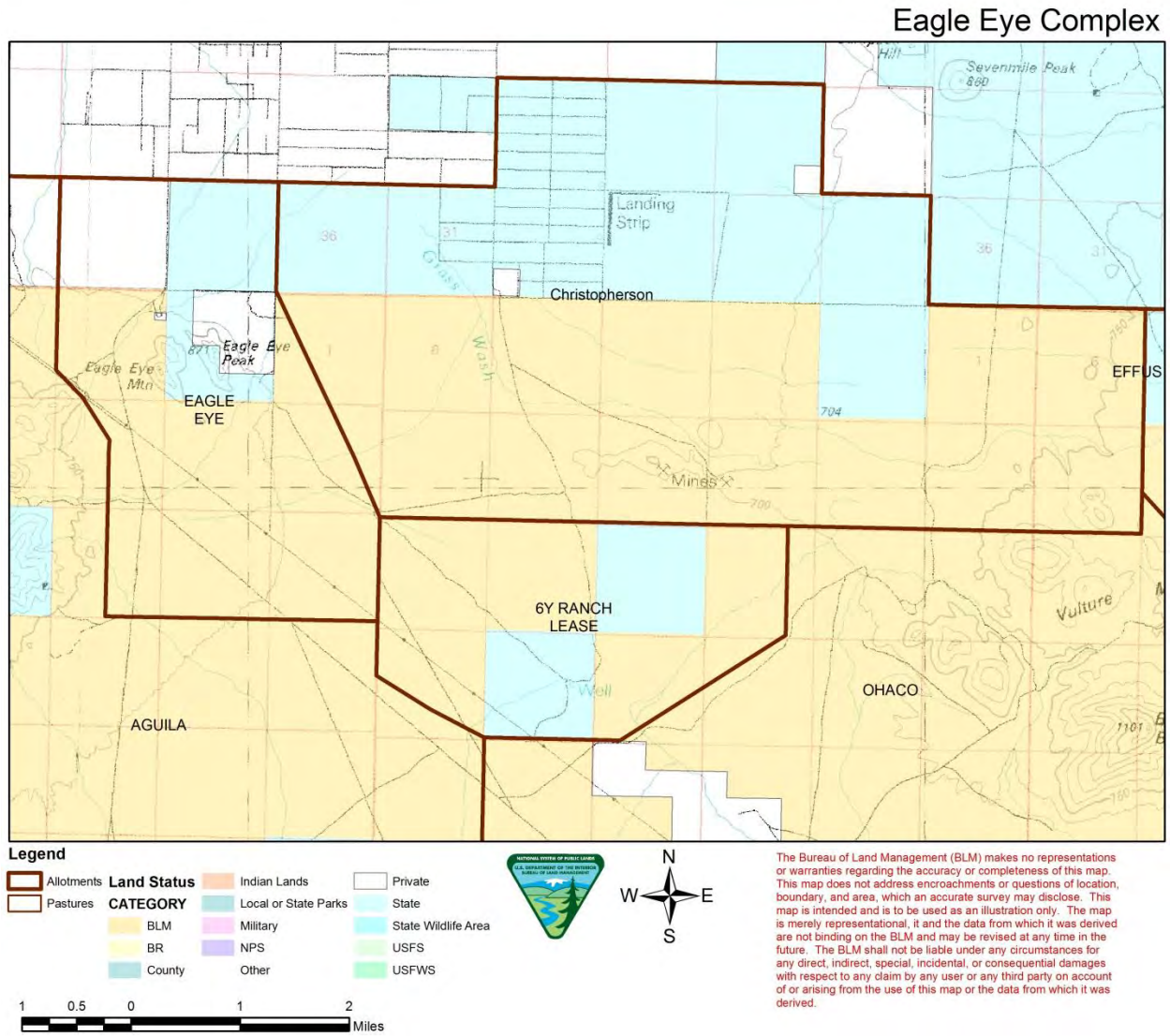
## **Introduction**

The Bureau of Land Management (BLM) is proposing to fully process the term grazing authorizations on the Eagle Eye Allotment (#3027), 6Y Ranch Lease Allotment (#5042), and Christopherson Allotment (#5025). A Rangeland Health Evaluation (RHE) was prepared for the three allotments in 2015 (Appendix A).

The Eagle Eye Complex is located south to east of the town of Aguila, Arizona. Eagle Eye and Aguila roads lie on the western side of the complex. The Complex covers approximately 25,558 acres in Maricopa County. The BLM-administered portion of the Complex is approximately 15,893 acres. The remaining acreage is Arizona State Trust Lands (8,626 acres) and privately owned (1,069 acres) (Figure 1).

This Environmental Assessment (EA) has been prepared to analyze and disclose the potential environmental consequences associated with the Proposed Action and alternatives for livestock management on the Eagle Eye Complex Allotments. The analysis was conducted in accordance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations (CFR) 1500-1508), and direction provided under BLM NEPA Handbook H-1790-1 (2008).

Figure 1



### Allotment Profile

The current permit and lease holder for the Eagle Eye and 6Y Ranch Lease allotments is the Serrano family. They acquired the allotments in 1989. The Christopherson permit is held by the Shiew family. They acquired the allotment in 2004.

BLM billing records show continuous use on these grazing allotments since the 1960s. Livestock have likely been present in this area since the mid-1800s.

**Table 1 Eagle Eye Allotment Profile**

Eagle Eye Allotment Profile	
Lessee	Serrano Family
Percent/Acres BLM Land	67 percent/3,858 acres
Percent/Acres State Land	17 percent/957 acres
Percent/Acres Private Land	17 percent/980 acres
Grazing Preference	0 Animal Unit Months (AUMs)
Season of Use	N/A
Range Classification	Ephemeral
Management Category	Maintain
Number and class of livestock use	0 Cattle

**Table 2 6Y Ranch Allotment Profile**

6Y Ranch Profile	
Lessee	Serrano Family
Percent/Acres BLM Land	69 percent/2,873 acres
Percent/Acres State Land	31 percent/1,278 acres
Percent/Acres Private Land	0 percent/0 acres
Grazing Preference	213 Animal Unit Months (AUMs)
Season of Use	Yearlong
Range Classification	Active
Management Category	Maintain
Number and class of livestock use	25 Cattle

**Table 3 Christopherson Allotment Profile**

Christopherson Allotment Profile	
Lessee	Shiew Family
Percent/Acres BLM Land	59 percent/9,162 acres
Percent/Acres State Land	41 percent/6,361 acres
Percent/Acres Private Land	1 percent/89 acres
Grazing Preference	1,367 Animal Unit Months (AUMs)
Season of Use	Yearlong
Range Classification	Active
Management Category	Maintain
Number and class of livestock use	156 Cattle



## **Purpose and Need**

The purpose of this action is to consider livestock grazing opportunities on public lands where consistent with management objectives, including the BLM *Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management* (Rangeland Health Standards) (BLM 1997).

The need for this action is established by the Taylor Grazing Act, the Federal Land Policy and Management Act, Fundamentals of Range Health (43 CFR 4180), and the Bradshaw-Harquahala Resource Management Plan (RMP) (BLM 2010) to respond to an application for renewal of an expiring livestock grazing lease to graze livestock on public land. In detail, the analysis of the actions is needed because:

- The Bradshaw-Harquahala RMP identifies resource management objectives and management actions that establish guidance for managing a broad spectrum of land uses and allocations for public lands in the Hassayampa FO. The RMP allocated public lands within the Eagle Eye Complex as available for domestic livestock grazing. Where consistent with the goals and objectives of the RMP and Land Health Standards, the issuance of grazing permits or leases to qualified applicants are provided for by the Taylor Grazing Act and the Federal Land Policy and Management Act.
- BLM Arizona adopted the Arizona Rangeland Health Standards (Land Health Standards) and Guidelines for Livestock Grazing Management (Arizona S&Gs) in all Land Use Plans in 1997 (Appendix A). The Land Health Standards and Guidelines for Grazing Administration were also incorporated into the RMP. The Land Health Standards for Rangeland should be achieving or making significant progress toward achieving the standards. Guidelines direct the selection of grazing management practices and, where appropriate, livestock facilities to promote significant progress toward, or the attainment and maintenance of, the standards. The RHE completed for the Eagle Eye Complex Allotment determined that Standards 1 and 3 are being achieved on upland sites, while Standard 2 is not applicable due to no above ground water sources within the allotments.

## **Decision to be made**

The Hassayampa Field Manager is the authorized officer responsible for the decisions regarding management of public lands within these allotments. Based on the results of the NEPA analysis, the authorized officer will determine whether the impacts of the Proposed Action described in this analysis are significant and would require preparation of an environmental impact statement (EIS). If the authorized officer determines that the impacts are not significant, this analysis will help to inform the decision to renew, renew with modifications, or not renew the leases and permits. If renewed, management actions, mitigation measures, and monitoring requirements will be prescribed for the Eagle Eye Complex Allotments to ensure management objectives and Rangeland Health Standards continue to be achieved.

## **Scoping & Public Participation**

Internal scoping was conducted with BLM specialists. External scoping was conducted via letters sent to individuals and organizations on the Consultation, Coordination, and Cooperation list. Recipients were asked to comment on the RHE and the Proposed Action. The scoping period for the Eagle Eye Complex was December 15<sup>th</sup> through January 15<sup>th</sup>, 2016. No external scoping responses were received.

## **Issues for Analysis**

For the purpose of BLM NEPA analysis, an “issue” is a point of disagreement, debate, or dispute with a Proposed Action based on some anticipated environmental effect. An issue is more than just a position statement, such as disagreement with grazing on public lands. An issue:

- has a cause and effect relationship with the Proposed Action or alternatives;
- is within the scope of the analysis;
- has not been decided by law, regulation, or previous decision; and
- is amenable to scientific analysis rather than conjecture.

For the purposes of this EA, the BLM analyzed issues if the analysis of the issue is necessary to make a reasoned choice between alternatives, or the issue is significant or may have potentially significant effects (BLM H-1790-1 2008). The Interdisciplinary Team (IDT) carefully considered comments by BLM specialists, the permittee, and affected agencies in order to identify issues relevant to issuing a 10-year grazing permit or lease. The issues derived from internal and external scoping on technical recommendations of the Eagle Eye Complex RHE (BLM 2014) are as follows:

*Issue 1 – Upland vegetation: How would continued livestock grazing affect the health of upland vegetation?*

*Issue 2 – Wildlife: How would continued livestock grazing affect priority wildlife species and migratory birds?*

*Issue 3 – Soils: Does livestock grazing affect cryptogamic crust presence?*

## **Conformance with Land Use Plan**

Rangeland management decisions in the Bradshaw-Harquahala RMP that pertain to the Proposed Action include:

### **Rangeland Management (GM)**

#### *Desired Future Conditions*

GM-1 Rangeland conditions conform to the Land Health Standards described in Arizona Standards for Rangeland Health and Guidelines for Grazing Administration, which describe the desired conditions needed to encourage proper functioning of ecological processes. These standards are described in greater detail in the above section on Land Health Standards.

GM-2 Watersheds are in properly functioning condition, including their upland, riparian, and aquatic components. Soil and plant conditions support infiltration, storage, and release of water that are in balance with climate and landform.

GM-3 Ecological processes are maintained to support healthy biotic populations and communities.

#### *Land Use Allocation*

GM-4 Administer 93 grazing authorizations within the grazing allotment boundaries shown on Map 13.

GM-5 Public lands without a grazing permit or lease authorization will remain unauthorized for livestock grazing.

### *Management Actions*

GM-6 Build livestock control fences and alternative water sources where needed to meet natural resource objectives. Fence construction and maintenance will follow guidance provided in BLM's Handbook on Fencing No. 1741-1.

GM-8 Inventory and/or monitoring studies are used to determine if adjustments to permitted use levels, terms and conditions, and management practices are necessary in order to meet and/or make significant progress towards meeting the Arizona Standards for Rangeland Health and other management objectives.

GM-9 Implement grazing management changes as needed to produce riparian areas that are in or making progress toward proper functioning condition.

GM-11 Range improvements needed for proper management of the grazing program will be determined and completed, including repair and/or installation of fences, cattle guards, water developments, and vehicle routes needed to access improvement areas.

GM-12 Vehicular access to repair range improvements by the grazing permittee or lessee is considered administrative access. Use of vehicle routes closed to public use, but limited to administrative uses, will be allowed to maintain or repair range improvements. Off-route vehicle use will require prior authorization unless the needed access is to resolve an immediate risk to human health, safety, or property.

GM-13 One-time travel off designated routes to access or retrieve sick or injured livestock would be authorized as an administrative use for transporting the animal to obtain medical help.

GM-14 Management practices to achieve Desired Plant Communities (DPCs) will consider protecting and conserving known cultural resources, including historical sites, prehistoric sites, and plants of significance to Native American people.

GM-15 Apply management actions outlined in the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (*Arizona Standards for Rangeland Health*) to recognize and correct potential erosion problems that could degrade other resources, with prioritized emphasis on sites that might directly affect species that have been listed as threatened, endangered, or candidate by the United States Fish and Wildlife Service (USFWS).

### *Guidelines for Standard One*

GM-17 Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites. The ground cover should maintain soil organisms, plants, and animals to support the hydrologic and nutrient cycles and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles, and energy flow.

### *Guidelines for Standard Two*

GM-19 Management practices maintain or promote sufficient vegetation to maintain, improve, or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge, and stream bank stability, thus promoting stream channel morphology (e.g. gradient, width/depth ratio, channel roughness, and sinuosity), and functions suitable to climate and landform.

### *Guidelines for Standard Three*

GM-27 DPC objectives will be quantified for each allotment through the rangeland monitoring and evaluation process. Ecological site descriptions available through the Natural Resources Conservation Service and other data will be used as a guide for addressing site capabilities and potentials for change over time. These DPC objectives are vegetation values that BLM is managing over the long term. Once

established, DPC objectives will be updated and monitored by the use of indicators for Land Health Standard Three.

## **Travel Management (TM)**

### *Motorized and Mechanized Travel and Public Access (TM)*

TM-8 All motorized and mechanized travel is limited to existing roads and trails, according to the BLM inventory of routes, until final route designations are made. Where inventories are not complete, use is limited to existing routes. Inventoried routes may be updated with new information from BLM, citizens, or partners. Livestock and game trails are not considered existing routes or trails.

TM-9 Cross-country travel is prohibited away from existing, inventoried routes. This prohibition will continue after routes are formally designated. The following exceptions apply in both cases

- Public health, safety, and law enforcement emergencies;
- Administrative uses; or
- BLM-authorized tasks approved by the authorized officer.

TM-13 Motorized vehicles may not be used off designated routes to retrieve game. The cross-country use of wheeled game carriers is permitted, except in wilderness areas. Permittees, including livestock operators, may not use motorized vehicles off designated routes without express permission from the Field Manager.

## **Relationship to Statutes, Regulations, or other Plans**

The Taylor Grazing Act and the Federal Land Policy and Management Act (FLPMA) recognize grazing as a valid use of the public lands and require BLM to manage livestock grazing in the context of multiple use and sustained yield. Additionally, livestock grazing on public lands is managed according to grazing regulations found in the Code of Federal Regulations (at 43 CFR Part 4100).

The Taylor Grazing Act of 1934 provides for two types of authorized use: (1) A grazing permit, which is a document authorizing use of the public lands within an established grazing district, and are administered in accordance with Section 3 of the Taylor Grazing Act; and (2) a grazing lease, which is a document authorizing use of the public lands outside an established grazing district, and are administered in accordance with Section 15 of the Taylor Grazing Act. The Eagle Eye Allotment is a Section 3 grazing permit, the 6Y and Christopherson allotments are Section 15 grazing leases.

Title 43 CFR 4100.0-8 states, in part, “The authorized officer shall manage livestock grazing on public lands under the principle of multiple use and sustained yield, and in accordance with applicable land use plans.” Title 43 CFR 4130.2(a) states, in part, “Grazing permits or leases shall be issued to qualified applicants to authorize use on the public lands and other lands under the administration of the Bureau of Land Management that are designated as available for livestock grazing through land use plans.”

The Proposed Action is consistent with the Fundamentals of Rangeland Health (43 CFR 4180.1) and Rangeland Health Standards, which were developed through a collaborative process involving the Arizona Resource Advisory Council and the BLM State Standards and Guidelines team. The Secretary of the Interior approved the Standards and Guidelines in April 1997. These standards and guidelines address watersheds, ecological condition, water quality, and habitat for special status species. These resources are addressed later in this document.

The Biological Opinion for the Bradshaw-Harquahala RMP (2006, 22410-05-F-0785) provides USFWS review of the continued implementation of the RMP. The opinion provides terms and conditions and/or

conservation measures for individual threatened or endangered species found within the boundaries of the Bradshaw-Harquahala management area.

Additionally, the following pertinent laws and/or agency regulations also apply:

- 43 CFR 4100 Grazing Administration - Exclusive of Alaska
- Taylor Grazing Act of 1934
- Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.)
- Public Rangelands Improvement Act of 1978
- 43 CFR 4100 Grazing Administration - Exclusive of Alaska
- Arizona Water Quality Standards, Revised Statute Title 49, Chapter II
- Clean Water Act of 1972, as amended
- Clean Air Act of 1970, as amended
- Endangered Species Act of 1973, as amended
- Section 106 of the National Historic Preservation Act of 1966, as amended
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001-3013; 104 Stat. 3048-3058)
- National Environmental Policy Act of 1969
- Wild Free Roaming Horse and Burro Act of 1971
- Migratory Bird Treaty Act of 1917, and Executive Order 13186 – *Responsibilities of Federal Agencies to Protect Migratory Birds*

## Chapter 2: Alternatives

This chapter describes the alternatives to be analyzed in detail in Chapter 3. The IDT developed three alternatives – Proposed Action, No Action, and No Grazing – based on the analysis and technical recommendations presented in the Eagle Eye Complex RHE (Appendix B), and to respond to issues identified during scoping. The alternatives are designed to meet the purpose and need for action, conform to existing land use plans, and satisfy the legal and regulatory requirements for rangeland management.

### Actions Common to All Action Alternatives

The following actions apply to each of the three action alternatives below.

#### *Arizona Standards for Rangeland Health*

All the alternatives were designed to meet the following objectives, as described in the Rangeland Health Standards:

1. Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).
2. Riparian and wetland areas are in properly functioning condition.
3. Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

### Stipulations

No road construction would be permitted in conjunction with the Proposed Action. Routine maintenance would be performed on existing range improvements as required.

### Alternative A – Proposed Action

The Proposed Action is to renew the Eagle Eye Complex permits and leases for a period of 10 years with the following terms and conditions (Table 6). These terms and conditions represent a recalculation of the % Public Land based on the current BLM and Arizona State Land Department permitted stocking rates. AUMs on public lands remain the same as the prior permits and leases.

**Table 4 Eagle Eye Complex Terms and Conditions**

Allotment	Livestock Number and Kind	Grazing Period	AUMs	% Public Land
Eagle Eye	0	3/1-2/28	0	100
6Y Ranch Lease	25	3/1-2/28	213	71
Christopherson	156	3/1-2/28	1367	73

### Other Terms and Conditions

Standard terms and conditions are found on Grazing Permit/Lease Form 4130-2a. In addition to the mandatory terms and conditions, other terms and conditions would be added to the permit under the Proposed Action:

1. Supplemental feeding is limited to salt, mineral, and/or protein in block, granular, or liquid form. If used, these supplements must be placed at least one-quarter (1/4) mile from livestock water sources, and one-eighth (1/8) mile away from major drainages and washes and sensitive wildlife habitat.

2. The permittee/lessee must properly complete, sign and date an Actual Grazing Use Report Form (BLM Form 4230-5) annually. The completed form(s) must be submitted to the BLM, Hassayampa Field Office(HFO) within 15 days from the last day of authorized annual grazing use (43 CFR 4130.3-2 9d)).
3. If in connection with allotment operations under this authorization, any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; 104 Stat. 3048; 25 U.S.C. 3001) are discovered, the permittee shall stop operations in the immediate area of the discovery, protect the remains and objects, and immediately notify the authorized officer of the discovery. The permittee shall continue to protect the immediate area of the discovery until notified by the authorized officer that operations may resume.

### **Alternative B – No Action**

A no action alternative is developed for two reasons. First, the no action alternative represents a viable and feasible choice in the range of management alternatives. Second, because a no action alternative represents the continuation of current management actions, it provides a benchmark of existing impacts continued into the future against which to compare the impacts of the other proposed management alternatives.

The No Action alternative would renew the Eagle Eye and Christopherson permits and 6Y Ranch Lease lease for a period of 10 years with the same terms and conditions as shown in Tables 1-6.

### **Alternative C – No Grazing**

This alternative was developed to address unresolved conflicts concerning alternative uses of available resources, in this case, alternative uses of forage (40 CFR 1501.2(c)). Under the No Grazing alternative, the BLM would not authorize grazing in the Eagle Eye, 6Y Ranch Lease, and Christopherson allotments (Eagle Eye Complex) for a ten-year term and all Animal Unit Months (AUMs) for active preference would not be available for livestock grazing on public lands (i.e., livestock grazing would be deferred for the ten-year permit period). No new range improvement projects would be constructed and no modifications would be made to existing projects.

### **Alternatives Considered but Dismissed from Detailed Analysis**

Alternatives may be dismissed from detailed analysis under the following conditions (BLM 2008):

- The alternative is ineffective and would not respond to the Purpose and Need
- It's technically or economically infeasible
- It's inconsistent with the land use plan
- Implementation is remote or speculative
- It's substantially similar to another alternative that is analyzed
- It would have substantially similar effects as an alternative that is being analyzed.

## Reduced Grazing Alternative

The IDT reviewed a “reduced grazing” alternative. The purpose of the alternative was to consider whether reducing the livestock stocking rate on the allotment presented a viable means of meeting the purpose and need for this action.

Rather than select an arbitrary number or percentage of reduction, the BLM typically uses a “desired stocking rate analysis”<sup>1</sup> to estimate livestock carrying capacity on the allotments. A stocking rate analysis provides a non-arbitrary method to identify alternative possible stocking rates on an allotment. This analysis identifies stocking rates based on a desired utilization percent of key forage species.

The stocking rate analysis used Key Area utilization data from 2009, 2013, and 2014. Actual use numbers provided by the grazing permittee were available for all years of utilization data. To generate the desired stocking rate, the actual use was multiplied by the desired utilization percent, and then divided by the observed utilization percent to yield desired use.

### Desired Stocking Rate Formula

$$\frac{\text{(Actual Use) (Desired Utilization Percent)}}{\text{Observed Utilization Percent}} = \text{Desired Stocking Rate}$$

Desired or objective utilization levels for the allotment were calculated using 40 percent for herbaceous and grass species and 30 percent for palatable shrubs. All data were used for years that both actual use and utilization data were available in the initial calculations (see project file). When utilization levels were recorded for more than one species, the highest use level was used. This method uses the concept of “limiting factor” which recognizes that the species used the most will determine the level of grazing use that will best manage for maintenance of the key forage species.

For shrubs, a utilization limit of 30 percent was used based on Mule deer guidelines provided by Heffelfinger (2006), who recommended utilization limits between 25 percent and 35 percent based on range condition. To generate the stocking rate, actual use was multiplied by the desired utilization percent; this factor was then divided by the actual utilization percent to find desired use, or stocking rate potential.

Based on the calculated potential stocking rate analysis, no reduction in stocking rate is necessary to meet objectives. The table below shows the calculated average stocking rate potential by allotment within the complex. This table is based on the lowest calculated potential stocking rate for each Key Area

Allotment	Current Authorized AUMs (including state lands)	Stocking Rate Analysis AUMs (includes state lands)
Eagle Eye	0	0
6Y Ranch Lease	300	750
Christopherson	1873	4188

The analysis shows an increased stocking rate potential on the both the 6Y Ranch Lease and Christopherson allotment. A Desired Stocking Rate analysis was not completed on the Eagle Eye due to its current stocking rate of zero. A year-long stocking rate increase was not proposed due to the limited forage value of tobosagrass when it is cured. Based on the desired stocking rate analysis, a reduction in AUMs on the allotment cannot be scientifically justified, and a reduced grazing alternative was not further considered.

<sup>1</sup> The desired stocking rate analysis was conducted in conformance with TR-4400-07, “Analysis, Interpretation, and Evaluation”, as given in Appendix 2 of the TR.





## Chapter 3: Affected Environment and Environmental Consequences

For each resource analyzed in detail, this chapter first provides a succinct description of the conditions and trends of issue-related elements of the human environment, and then analyzes and describes the potential environmental consequences, or impacts, that would occur as a result of implementing the alternatives. Topics analyzed in this chapter are listed in Chapter 1 (see Issues for Analysis) and include upland vegetation, invasive plants, soil resources, riparian and groundwater resources, and wildlife resources. Resources that may exist within the project area, but would not be impacted by the Proposed Action, are described under the section titled “Resources Dismissed from Further Analysis” below.

### General Project Setting

The current permit and lease holder for the Eagle Eye and 6Y Ranch Lease allotments is the Serrano family. They acquired the allotments in 1989. The Christopherson permit is held by the Shiew family. They acquired the allotment in 2004.

The BLM administered portion of the complex is approximately 15,893 acres. The remaining acreage is Arizona State Trust Lands (8,626 acres), and privately owned (1,069 acres). The allotments are located in Maricopa County. The terrain is gently rolling to steep hills and mountains that are bisected by numerous drainage ways. The legal descriptions of the allotments are given in Table 6, below.,

**Table 7. Legal Descriptions of permitted and leased public lands**

Allotment	Township	Range	Sections
Eagle Eye	6N	9W	11,13,14 and portions of 1, 3, 10,12,15
6Y Ranch	6N	8W	17,18, and portions of 15,19,21,22
Christopherson	6N	7W	6,7
	6N	8W	1,3,4,5,6,7,8,9,10,11,12
	6N	9W	Portions of 1,12

### Upland Vegetation

#### Affected Environment

This section discloses the impacts of livestock grazing on upland vegetation within the allotments. This section also responds to the following issues identified in Chapter 1:

*Issue 1 – Upland vegetation: How would continued livestock grazing affect the health of upland vegetation?*

The BLM develops RHEs to determine whether standards are being achieved on a grazing allotment and to determine if livestock grazing is a causal factor for not achieving, or failing to make significant progress toward achieving, land health standards.

In general, the BLM reported that the Complex exhibited a positive plant community structure in the Sonoran Desert environment. The most dominant plant species found across the Complex were mesquite, white bursage, tobosagrass, and pricklypear, many of which are key forage species. In most instances, these species were in very good condition, with little utilization. Their abundance and vigor across the Complex attest to the good condition of the rangeland and the success of the current grazing management

system. Several key areas within the complex have high grass density and low utilization values, indicating grazing is within acceptable levels for the plant community types.

Key areas were monitored and analyzed in 2013/2015 to determine whether indicators of ecological processes conform to the Rangeland Health Standards. A key area is an indicator area that represents a larger ecological site. Key areas reflect the current grazing management over similar areas in the unit and serve as representative samples of range condition, trend, use and production. A total of 5 key areas have been established across the Eagle Eye Complex: one key area on the Eagle Eye allotment, two key areas on the 6Y Ranch allotment, and two key areas on the Christopherson allotment (RHE Section 7.1).

All key areas on the Complex have attribute ratings of “None to Slight” departure from the Ecological Site Description (ESD) Reference Sheets. These ratings do not appear to be affected by livestock based on the utilization levels (Eagle Eye Complex RHE in Appendix B). Departures from the applicable reference sheets are within the tolerances listed in the RHE.

Desired Plant Community (DPC) objectives are established for each Key Area within the Eagle Eye Complex. All DPC objectives are being achieved at Eagle Eye Key Area 1, both key areas on the 6Y allotment, as well as both key areas on the Christopherson allotment.

Perennial grass composition objectives are being achieved at all key areas on the complex with perennial grass objectives. 6Y Ranch Key Area 1 and Christopherson allotment Key Areas 2 vegetative foliar cover objectives are not met. All other objectives within the complex are being met.

Utilization data does not indicate that current levels of livestock use are a causal factor for not achieving the DPC objectives. Utilization levels at all the key areas on the Eagle Eye complex did not exceed the “slight” use category of 0-20% utilization level within the last five years.

Overall, the RHE reported that the Eagle Eye Complex allotments are meeting all Rangeland Health Standards in the upland areas. All five sites across the Complex of allotments are consistent with ESDs in soil/site stability, hydrologic function, and biotic integrity and meet Standard 1. Five sites across the Complex are consistent with DPC objectives and meet Standard 3.

## **Environmental Consequences**

### **Alternative A – Proposed Action**

The Proposed Action is to renew the Eagle Eye Complex permits and leases for a period of 10 years with the following terms and conditions. These terms and conditions represent a recalculation of the % Public Land based on the current BLM and Arizona State Land Department permitted stocking rates. AUMs on public lands remain the same as the prior permits and leases.

The Proposed Action “Other Terms and Conditions” stating that “Supplements would be restricted within 1/4 mile of watering facilities or 1/8 mile upslope from drainages and dry washes” will improve livestock distribution within the allotments, allowing for recruitment of native vegetation. Given adequate climatic conditions, grasses will be expected to recolonize sites. This is expected to increase vegetative foliar cover within the allotments.

The 6Y allotment has potential to support additional livestock following monsoonal green-up of *Pleuraphis* species. Given current livestock stocking rates and utilization levels, the current perennial stocking rate should be maintained, with a seasonal stocking increase during the warm-season grass growing season. *Tobosa* species on the allotment would likely benefit from short-term increased grazing to reduce standing dead prior season growth.

In conclusion, under the Proposed Action, Rangeland Health Standards for upland vegetation would continue to be met. DPC objectives at most of the key areas would continue to be met, with improvements expected due to mineral placement which will aid in livestock distribution.

### **Alternative B – No Action**

Currently, the Eagle Eye Complex meets applicable Arizona Standards for Rangeland Health for upland vegetation. All sites are consistent with ESDs in soil/site stability, hydrologic function, and biotic integrity, and meet Standard 1 and 3.

Under this alternative, no restrictions would be placed on locating mineral supplements. As a result it is expected that under the No Action scenario more trampling would occur near water developments and within drainages when compared to the Proposed Action. Overall, livestock distribution would not be expected to change.

The No Action alternative would renew the Eagle Eye permit and 6Y Ranch Lease and Christopherson leases for a period of 10 years with the same terms and conditions.

### **Alternative C – No Grazing**

Upland vegetation would have the most rest and recovery under a no grazing scenario. Although the Complex is meeting all applicable standards for rangeland health in the uplands, plant communities would still benefit from rest. Because no livestock grazing would occur, plants would remain ungrazed by livestock, with the only browse pressure coming from wildlife. Grasses would see greater benefits as compared to the other alternatives because grazing pressure would not impede their ability to fix a significant amount of carbon and produce and set seed.

The plants that would most benefit from no grazing are shrub species. Current year's growth – the leaves and young stems that are important for photosynthesis – is the most digestible part of the plant and is the portion generally removed by browsing animals. The buds are especially important to protect from grazing because they will be the source of new stems.

Under this alternative, upland vegetation would improve the most in productivity, vigor, species composition, and formation of new stems compared to the other alternatives.

## **Invasive Plants**

### **Affected Environment**

Monitoring results at the key areas on the Complex do not indicate a problem with the presence of invasive plant species. Bare ground, canopy cover, and litter – factors that can affect the presence of invasive species – were within expected ranges for all key areas. Monitoring found that departure from the ESD for invasive species was “none to slight” at all five key areas.

The RHE reported that key areas were as expected for their ecological site descriptions for plant species composition, cover, and frequency, and that ground litter was within expected surface cover range for the ecological sites. Species composition data showed a relatively high percentage of perennial grasses and palatable shrubs: the presence of herbaceous and perennial plants is recommended to help control invasive plants like red brome (USDA 2012).

DPC objectives were met at all of the key areas. Red brome is present on the allotments, however, it is a minor component of the annual vegetation on the complex. The Hassayampa FO is not managing for red brome. No noxious weeds have been identified on the complex.

## **Environmental Consequences**

### **Alternative A – Proposed Action**

The Proposed Action is designed to maintain or improve conditions favorable to meeting DPC objectives and Rangeland Health Standards.

Under the Proposed Action, vegetative cover and perennial grass composition should improve, which would help prevent the introduction and spread of invasive plants.

Red brome in abundance can alter the fire regime in desert plant communities. However, the spread and distribution of red brome would remain dependent on annual precipitation. Maintaining DPC objectives would provide conditions under which native plant species would continue to outcompete red brome, and therefore maintain the existing fire regime.

The Complex is currently meeting standards for upland conditions. As the BLM continues to monitor utilization of upland key forage species over time to ensure average utilization of key herbaceous forage species does not exceed 40 percent, which is light moderate use, it is expected that renewing the grazing permit and leases would not contribute to spread of non-native, invasive plants.

### **Alternative B – No Action**

Under the No Action alternative, the season of use and livestock distribution (mineral placement restrictions) would remain unchanged from the present. As such, present conditions in terms of soil litter and vegetation composition and cover would remain unchanged. Because the current management of livestock does not indicate a declining trend in expected ecological site conditions based on the monitoring data, a change in the presence or distribution of invasive, non-native plant species is not expected.

### **Alternative C – No Grazing**

Removal of grazing by domestic livestock would not automatically lead to disappearance of invasive plant species (Young and Clements 2007), and would not be expected to affect the presence or distribution of red brome within the allotments.

Although livestock grazing is observed to be one of the disturbance types that influence the invasive potential of the species (USGS 2003), red brome can be found across both disturbed and undisturbed landscapes (USDA 2012). While the No Grazing alternative may provide benefits by removing cattle and, therefore, one form of disturbance to soils and vegetative cover within the allotment, this alone would not be expected to affect the presence of red brome in the allotments. Further, there is no indication that the spread and distribution of the invasive can be controlled or eradicated outside of active management.

Competition by crowding has been shown to reduce the reproductive success of red brome (Halvorson 2003). Under the No Grazing alternative, upland vegetation would improve the most in productivity, vigor, species composition, and formation of new stems compared to the other alternatives. However, due to the low cover nature of much of these allotments, outside of the grassland areas, no effect on red brome is expected. Some reduction of red brome presence would be expected in the tobosa grass flats.

## **Soil Resources**

This section responds to Issue 4: *Does livestock grazing affect cryptogammic crust presence?*

### **Affected Environment**

The erosional context across the allotment is stable. Low slope gradients have prevented excessive erosion on most of the complex, along with the grasslands occurring in portions of the allotments. On the

Christopherson allotment, diversion dikes have slowed overall sheet flow erosion, but have led to some minor rilling along elevation gradients and open flow paths such as roads.

Soil mapping shows a low to moderate risk for erosion by wind. The wind erodibility index scores soils from 0 tons to 56 tons per acre per year assuming no groundcover, with the exception of Anthony, Mohave sandy loams, and Guest soils which have a potential for 86 tons per acre assuming no ground cover (see NRCS 2008). The Mohave and Guest soils are associated with the tobosagrass flats within the complex.

Water erosion within the allotment occurs during intense summer thunderstorms. Soils have well drained conditions but intense rainfall can overwhelm soil infiltration capacity and create overland flow. The intense monsoon rainfall can produce overland flow in part due to dry soils forming crusts that resist percolation. Overland flow transports soil particles along erosion pathways from runoff surfaces to run-on areas, typically formed by vegetation patches or topographic breaks, and on the Christopherson allotment, man-made diversion dikes. Compaction and trailing from cattle can exacerbate erosion when trails align with water flow pathways when soils are wet. This effect is mostly localized around livestock water sources on the complex.

RHE findings did not note substantial departure from expected abiotic and biotic conditions outlined in the ESDs. The low slopes across most of the complex limit active erosion. All five key areas showed only slight sign of active surface erosion suggesting stable soils. These areas showed a none to slight departure from the reference state for soil site stability, hydrologic function, and biotic integrity.

The biotic conditions that can indicate soil productive capacity did not show signs of substantial deviation from expected plant community composition, abundance, and annual crop.

Desert soils have known contributions from biological soil crusts, also called cryptogamic crusts, for soil biologic function. The particular ecological province of the project area with a thermic climate is expected to favor cyanobacteria that have a flat appearance. A byproduct of crust presence is aggregation that binds soil particles. Using the RHE measures, the soil aggregate stability tests did not find aggregation substantially departed.

The ESDs for the key areas do not indicate a large presence of soil crusts. The absence of crusts in the sampling may be attributed to the period of sampling and crust species composition. The organisms shrink and swell according to available water, being able to quickly take advantage of short precipitation episodes (Cable and Huxman 2004). Sampling during dry periods will produce less frequency scores. In addition, gravel and rock conditions do not promote the formation of macroscopic crusts, favoring smaller organisms. A third factor for the low recorded crust presence is the inverse relationship with vascular plant cover. Vegetation across the Complex was shrub-dominated and had a foliar cover of 10-50% across all sites. Additionally, the tobosa flats within the complex are on vertic clay soils. Due to the natural turning and heaving of these soils, cryptogamic crust cover is unlikely to establish and occur on these soils.

Livestock grazing does affect soil productivity by removing a portion of the standing crop. Annually produced biomass serves both a physical and biological role. Litter physically works to insulate soils from evaporation and contributes as protective groundcover. Decomposition of litter provides substrate for soil microbes that increases available nutrients.

The litter on the allotment is primarily produced from shrubs and grasses. The rocky soils favor shrubs and cacti, while the loamy clay soils on the flats favor grass production. Grasses and some forbs rely on fine soil textures since rooting concentrates in the top 10 centimeters. Since grazing targets primarily herbaceous species, the impact of the grazing on annual crop will be difficult to detect. The litter from the allotment plant communities consists of shrub and herbaceous leaves, twigs and roots. Monitoring

measured litter to be 8 percent to 51 percent total groundcover at the key areas. The litter fraction of groundcover was not found departed from expected conditions.

## **Environmental Consequences**

### **Alternative A – Proposed Action**

The Proposed Action would improve soil conditions by improving livestock distribution. The greatest change would result from increased dispersal by use of mineral blocks, which would lower the pressure on forage vegetation in livestock concentrating areas. Although noticeable improvements in soil conditions would be slight to none, the added dispersal would curtail concentrated grazing pressure that affects soil and vegetation communities..

The current stocking rates would likely have a low effect on erosion since the grazed vegetation makes up a small fraction of the overall canopy cover. Canopy cover intercepts and disperses rainfall and disrupts overland flow generation. Measured vegetation cover ranged from 11 percent to 29 percent with less than 10 percent expected grasses on the majority of these ecosites. The monitoring showed bare soils ranged from 7 percent to 49 percent, largely because of the lower cover in the creosote flats, gravel and stone cover, and litter conditions. Gravel and stone ranged from 0 percent to 38 percent. Given the low numbers and armored soils and considering the stable conditions suggested by the monitoring, continuation of the grazing permit would not result in further degradation from erosion.

The impacts of grazing on soil biotic crusts are difficult to discern because within this environment, cyanobacteria type crusts may exist below the gravel surface and would be difficult to detect.

### **Alternative B – No Action**

The No Action and Proposed Action would result in similar effects to soil resources. The primary difference is that this alternative would take no actions to increase livestock dispersal across the Complex. Although present impacts to soils are minor, grazing pressure, and therefore soil impacts, would continue in areas of concentrated use. However, continuing present livestock management practices on the Complex would not result in impaired soil conditions given the findings of the RHE.

### **Alternative C – No Grazing**

The removal of livestock from the Complex would increase the litter for soil processes and reduce compaction and bare soil exposure from livestock trampling. Impacts would be highest where groundcover slowly re-establishes at grazing congregation areas.

The impacts to vegetation and soils across the range would be slow and depend on the level of forage that livestock grazing previously impacted. Potentially, an increase in annual crop would boost substrate available for soil functional processes. However, the response from livestock removal would be low since rangeland forage makes up a small percentage of the annual crop. Changes would be highest where grasses and forbs thrive.

Using Michunas's (2006) review of plant community response to livestock grazing, we would expect a very slow vegetation response to livestock removal in arid and semi-arid environments. In reviews of long-term studies on Chihuahu desert scrub with similar precipitation patterns to the Complex, findings indicate very little change in perennial grass cover after 16 to 25 years. In addition, because grass and forb communities are reaching late seral composition, it's likely that eliminating grazing pressure would result in a slow response.

Finally, the response from no grazing may be small since less change is associated with reductions from moderate compared to heavy grazing levels. A seven year study near Flagstaff found significant

reductions in vegetation cover and plant community composition only in the heavily grazed treatment when compared to the moderate and no grazing treatments (Loesser et al. 2006).

## **Wildlife Resources**

This section provides site-specific analysis of potential impacts to wildlife resources and addresses the following issues:

Issue 2:

*Issue 2 – Wildlife: How would continued livestock grazing affect priority wildlife species and migratory birds?*

## **Affected Environment**

### *General Wildlife Species*

Wildlife species that occur within the Eagle Eye Complex are typical and representative of the vegetative communities present in the area. Species present include, but are not limited to, mule deer, coyote, javelina, mountain lion, bobcat, gray fox, desert cottontail, black-tailed jackrabbits, Gambel's quail, and various reptiles, small mammals, bats and migratory birds.

The Eagle Eye Complex is located within the Arizona Game and Fish Department management units 42 and 44A. Javelina (*Pecari tajacu*) and desert mule deer (*Odocoileus hemionus*) are two big game species that utilize the Eagle Eye Complex. Mule deer rely heavily on browse and forbs, which make up the majority of their diet (greater than 90%). Grasses and succulents were generally less than 5 percent of mule deer diet (Krausman et al. 1997, Heffelfinger et al. 2006). Desired key forage species for mule deer and javelina that exist in the Complex include white ratany, erodium species, mesquite and succulents including prickly pear, barrel, and hedgehog cacti.

Across all ecological sites, current vegetative species composition and structure provides cover and forage to support a diverse wildlife community. Shrubs, grass, trees, forbs and cacti are available to provide forage, cover, and nesting opportunity for many bird species as well as cover and palatable browse for mule deer and javelina. The vegetative community present on the allotment provides habitats suitable for a variety of wildlife species from reptiles and small mammals to various birds, and game species as well as predators that depend on these species groups.

### *Migratory Birds*

All migratory birds are protected under the 1918 Migratory Bird Treaty Act (16 USC 703), which prohibits the taking of any migratory birds, their parts, nests, or eggs unless specifically permitted by regulation. Additional protection is provided by the Neotropical Migratory Bird Conservation Act of 2000 (16 USC Chapter 80). Executive Order 13186 requires the BLM and other federal agencies to work with the USFWS to provide protection for migratory birds, primarily in the form of habitat protection to avoid migratory pattern disruption. Species present include, but are not limited to, Gila woodpecker, Bendire's thrasher, Costa's hummingbird, Loggerhead Shrike, crissal thrasher, mourning dove, elf owl, Harris's hawk, and red-tailed hawk.

### *Special Status Species*

Special status species include federally listed, candidate and proposed species as well as BLM sensitive species. Sonoran desert tortoise (*Gopherus morafkai*) is a BLM sensitive species known to occur on the Eagle Eye Complex. Sonoran desert tortoises occupy much of the upland areas in the Eagle Eye Complex. The desert tortoise distribution within the Complex is not uniform. Tortoises tend to occupy



hillsides and ridges with outcrops of large boulders as well as areas with incised washes and caliche caves, but may be found in lower densities throughout the area. Tortoises generally use natural and excavated cover sites between or under boulders and in caliche caves along washes wherever they occur. Their diet consists of annual forbs (30.1%), perennial forbs (18.3%), grasses (27.4%), woody plants (23.2%) and prickly pear fruit (1.1%) (Van Devender, et al. 2002). Palatable forage species are available for Sonoran desert tortoise throughout the Complex. The Eagle Eye Complex contains 1,855 acres of Category I desert tortoise habitat, 7,138 acres of category II desert tortoise habitat and 6,901 acres of category III desert tortoise habitat (Reference Appendix B). Category I habitat is defined as: 1) Habitat that is essential to the maintenance of large, viable populations; 2) Habitat where conflicts are resolvable; and 3) Habitat that contains medium to high densities of tortoises or low densities contiguous with medium or high densities. Category II habitat is defined as: 1) Habitat that may be essential to the maintenance of viable populations; 2) Habitat where most conflicts are resolvable; and 3) Habitat that contains medium to high densities of tortoises or low densities contiguous with medium or high densities. Category III habitat is defined as: 1) Habitat that is not considered essential to the maintenance of viable populations; 2) Habitat where most conflicts are not resolvable; and 3) Habitat that contains low to medium densities of tortoises not contiguous with medium or high densities.

## **Environmental Consequences**

### **Alternative A – Proposed Action**

#### *Wildlife and Migratory Birds*

Both cattle and wildlife utilize vegetation. Various wildlife species (e.g., mule deer, some migratory birds) depend on forbs and shrubs for forage and concealment. Insectivore species such as bats or some migratory birds are indirectly dependent on vegetation to support their insect population diet or to provide a substrate for nesting, roosting, or concealment. Larger predator species are indirectly dependent on vegetation to provide forage and cover for prey species such as small mammals and birds. The presence and movement of livestock between areas can result in the direct disturbance or displacement of individual wildlife species from areas providing cover and forage. Competition between livestock and a variety of wildlife species can occur where livestock and wildlife are utilizing the same forage plants.

Presently, Rangeland Health Standards for upland habitat are being met, and DPC objectives are also being met at all of the key areas across the Complex. The Proposed Action is designed to improve conditions for upland vegetation near livestock water sources, major drainages and washes through restrictions on supplement placement. This would maintain or improve upland vegetation productivity over current conditions in the vicinity of drainages and washes across the Complex, providing increased forage opportunities and cover for wildlife species in important desert wash habitat. This would be expected to benefit mule deer and a variety of migratory birds. This would also be expected to increase seed production in these areas for seed-eating species and residual forage for insects, providing important prey for bats, insectivorous migratory birds, and raptors.

Routine maintenance of water sources (tanks and troughs) on the Complex would continue to benefit wildlife species in this arid environment. Individual wildlife species could be displaced when cattle are present at water sources, but would be expected to return once livestock moved to other locations.

#### *Special Status Species*

Desired plant community objectives we set to provide adequate forage for Sonoran desert tortoise (Appendix B). Perennial grasses are an important year-round food source for desert tortoises (Oftedal 2002). Objectives for perennial grasses were achieved at all key areas in the Complex where perennial grass objective were set (Appendix B). Palatable browse objectives were also achieved at all of the key areas where palatable browse objectives were set. Vegetation utilization levels were in the “slight” use

category of 0-20% utilization (Appendix B). The Proposed Action is designed to improve conditions for upland vegetation near livestock water sources, major drainages and washes through restrictions on supplement placement. This would maintain or improve upland vegetation productivity in the vicinity of drainages and washes across the Complex, providing increased forage opportunities and cover for desert tortoises in these areas.

### **Alternative B – No Action**

For upland areas, the No Action alternative would not provide the additional benefits to key wildlife forage species expected under the Proposed Action. Rangeland Health Standards and palatable forage objectives for wildlife would continue to be met at most key areas, but the improvements in upland vegetation condition expected in the Proposed Action would not be expected to occur in this alternative. Overall, livestock distribution would not be expected to change. Under this alternative, no restrictions would be placed on locating mineral supplements. As a result it is expected that more trampling would occur near water sources and desert wash habitat compared to the Proposed Action. General livestock grazing disturbance and displacement effects to wildlife in upland habitat would be similar to the Proposed Action.

### **Alternative C – No Grazing**

In the absence of livestock grazing, competition for wildlife forage vegetation would be reduced, providing more forage for wildlife and insect populations. The absence of livestock grazing could result in canopy cover increasing over time, benefiting cover-dependent species. Water developments would not be maintained or could be turned off, reducing water availability for wildlife in the Complex over time. Livestock disturbance/displacement effects would not occur, benefiting nesting migratory birds and other wildlife individuals. With the absence of grazing year round, these improvements in vegetative cover conditions would be expected to occur more rapidly. The recruitment of herbaceous species cover would be expected to be greater under this alternative, further benefiting wildlife species.

### **Cumulative Actions**

The CEQ defines cumulative effects (also known as cumulative impacts) as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what (federal or non-federal) agency or person undertakes such actions” (40 CFR 1508.7).

The intensity, or severity, of the cumulative effects considers the magnitude, geographic extent, duration, and frequency of the effects. The magnitude of the effect reflects the relative size or amount of the effect; the geographic extent considers how widespread the effect may be; and the duration and frequency refer to whether the effect is a one-time, intermittent, or chronic event.

If there is no net effect to a particular resource from an action, then there is no potential for cumulative effects. In addition, if effects that do not overlap in time and/or space, they do not contribute to cumulative effects. The temporal frame for analysis of cumulative effects is 10 years, which is the time period for the grazing lease. The spatial scale is the 192,719 acre Eagle Eye Complex.

The past, present, and reasonably foreseeable future actions considered in the cumulative effects analysis are summarized below.

A wide variety of land uses and activities are possible on the Eagle Eye Complex allotments, including travel, recreation, mineral development, grazing, and others. Specific actions that are occurring, or are likely to occur in the reasonably foreseeable and contribute to cumulative effects include:

### **Livestock Grazing**

The Eagle Eye Complex has been actively grazed for decades, and livestock grazing has occurred in some form on the allotment areas for over a century. The environmental effects of past grazing practices are reflected in the current description of the affected environment for the allotment. If left unchanged (No Action), current grazing practices are not expected to contribute toward downward trends in upland vegetation resource conditions on the allotments. Under the No Grazing scenario, improvement in resource conditions are expected to be mild to moderate over the long-term as soil, vegetative conditions, and riparian areas slowly recover from long-term livestock grazing on the allotment. Continued livestock grazing is not anticipated to result in cumulative effects to non-native, invasive vegetation. Continued livestock grazing is not anticipated to result in any cumulative effects to wildlife species or habitat in the project area.

### **Soils**

No substantial cumulative effects to soils were identified. There may be increased trailing to new salt and supplement locations, but effects are expected to be negligible and highly localized. Compaction is expected to continue on established routes with increased recreational use in the area due to the expansion of Wickenburg and surrounding communities. The incremental impact of livestock grazing is not anticipated to result in a significant impact to soils.

### **Developments**

No new or proposed developments or projects were identified within the project area. A number of existing rights-of-way (ROWs), including roads, pipelines, and public utilities, intersect portions of the Eagle Eye Complex. Owners/operators are authorized to access ROWs for routine maintenance and repair. Minor disturbances or impacts to resources may occur due to vehicle access and maintenance activities, such as brush clearing, within the ROWs. These past and continuing actions associated with ROWs are not expected to contribute additional incremental impacts beyond those described in Chapter 3 of this EA.

## **Resources Dismissed from Detailed Analysis**

This section lists and describes the issues, resources, and concerns dismissed from analysis in this EA. These potential issues were identified during project scoping, and include elements of the environment that by statute, regulation, or EO must be considered in all EAs (BLM 2008, Appendix 1).

The purpose for dismissing issues in an EA is to focus the environmental analysis on issues that are truly significant to the proposed action, and to avoid amassing needless detail in accordance with CEQ regulations (40 CFR 1500.1(b)). CEQ requires that impacts shall be discussed in proportion to their significance, and for non-significant issues, there should be only enough discussion to show why more study is not warranted (40 CFR 1502.2). The following issues are dismissed from further analysis with explanation because (1) they do not exist in the project area, or (2) they would not be impacted by the proposed action(s), or (3) the potential impacts are not measurable or are negligible.

### **Air Quality – Present, Not Impacted**

The Clean Air Act of 1970 and subsequent amendments required the Environmental Protection Agency to establish National Ambient Air Quality Standards (NAAQS), which specify maximum levels for six criteria pollutants: carbon monoxide, nitrogen dioxide, ozone, particulate matter (PM), sulfur dioxide, and lead. Livestock operations have the potential to release fugitive dust and carbon monoxide associated with cattle trailing, range improvements, and vehicle use. Maricopa County is classified by EPA as “attainment” for the purposes of NAAQS.

The RHE for the Eagle Eye Complex found that conditions on the allotment are meeting rangeland health standards for vegetation cover (Standard 3) and for soil conditions (Standard 1) (BLM 2013). Because none of the actions considered in this EA would increase grazing activities, there is no expectation that the actions would measurably impact air quality or lead to non-attainment of NAAQS.

### **Accommodation of Sacred Sites – Not Present**

EO 13007, *Indian Sacred Sites* (1996), requires Federal agencies to (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and (2) avoid adversely affecting the physical integrity of such sacred sites. No known sacred sites are present in the project area, and during consultations with the American Indian Tribes that claim cultural affiliation to the area, no Native American religious concerns were identified in relation to livestock grazing within these allotments.

### **Areas of Critical Environmental Concern – Present, Not Impacted**

The Eagle Eye allotment contains 334 acres of the 74,950 acre Harquahala ACEC. No effects to the ACEC are expected under the proposed action.

### **Cultural Resources**

Cultural and heritage resources within the Hassayampa Field Office represent evidence of more than 10,000 years of human occupation of the region. The majority of the cultural resources on public lands are archaeological sites reflecting both pre-Columbian and post-contact occupation.

According to Arizona BLM Handbook H-8110, Guidelines for Identifying Cultural Resources (BLM 1999), livestock grazing permit renewals are generally exempt from cultural resources surveys. Range improvements, however, are land disturbing activities that require site-specific survey. Based on the proposed action, which would not involve any ground disturbing activities as proposed, the BLM conducted a Class I Literature Search and a Class III intensive archaeological survey was previously conducted in the area in 1974, 1978, and 2012.

A Class I survey (literature search) was conducted to identify whether previously recorded cultural resources or archaeological projects occur within or adjacent to the proposed project area. The parameters of the literature search included the locations of the proposed area discussed in the EA and a 1/4 mile search boundary. The Class I survey revealed that cultural resources surveys have been conducted with

the Eagle Eye Complex allotments. None of these Class III surveys identified any significant cultural resources.

Class III intensive cultural resources survey was conducted within the project areas as proposed previously for projects not related to this EA. The previously completed Class III Survey focused on proposed transmission lines and BLM Survey Units for land exchanges, including a survey buffer appropriate to the proposed reason for the survey and meeting BLM standards. The surveys in total resulted in a survey area totaling approximately 2 acres. The Class III survey resulted in the identification of a single previously identified linear lithic scatter AZ T: 5:5(ASU) identified in 1974 and 1978 and not observed in 2012 by LSD. No additional cultural resources were identified during the survey. No impacts to cultural resources are expected from this action.

### **Energy Conservation/Energy Requirements and Conservation Potential**

The CEQ's NEPA Guidelines Section 1502.2(e) indicates that the discussion of environmental consequences must include analysis of the ". . . [e]nergy requirements and conservation potential of various alternatives and mitigation measures." There are no new range improvements being proposed at this time.

No energy would be expended at this time, Therefore, the topic is dismissed from further analysis.

### **Environmental Justice – Not Present**

EO 12898, *General Actions to Address Environmental Justice in Minority Populations and Low Income Populations* (1994), requires all Federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low income populations. The proposed action would not result in disproportionate health or environmental effects on minorities or low income populations or communities. Nothing inherent in the alternatives considered would cause any statistically significant changes to ethnic composition of the resident populations and there is no indication that there would be any adverse economic effects on any particular ethnic group or any particular income group under any alternative.

### **Hazardous and Solid Wastes – Not Present**

No known hazardous or solid waste issues occur in the allotment (BLM 2007 p. 437).

### **Floodplains or Wetlands – Not Present**

EO 11988, *Floodplain Management* (1977) and EO 11990, *Protection of Wetlands* (1977), require all Federal agencies to avoid construction within the 100-year floodplain unless no practicable alternative exists, and to minimize the destruction, degradation, or loss of wetlands. The proposed action does not result in any impacts to floodplains or wetlands.

### **Paleontological Resources – Not Present**

Bedrock exposures within the allotments are composed of igneous intrusive and volcanic extrusive rocks of Proterozoic and Phanerozoic age. Paleontological resources never occur in igneous rocks and only very rarely in some types of volcanic rocks. Cenozoic age unconsolidated sediments of fluvial and colluvial origin comprise the non-bedrock areas within valleys and drainages and generally have a low potential for the occurrence of paleontological resources. There are no paleontological resources known to exist within the allotments. Management actions are designed to inventory and protect fossil sites if they are discovered in the course of normal management activities (BLM 2007 (FEIS)).

### **Prime and Unique Farmlands – Not Present**

Under the *Farmland Protection Act* of 1981, Federal agencies seek to minimize the unnecessary or irreversible conversion of farmland to nonagricultural uses. No unique or prime farmlands exist within the project area; therefore, the proposed action would have no impact on this resource (BLM 2007, p. 437).

#### **Recreation – Present, Not Impacted**

Recreation opportunities within the project area are classified in the Bradshaw-Harquahala RMP. Continued livestock use would not affect the availability of recreational opportunities within the allotment. In many instances, recreationists use the same roads, primitive roads, and trails as grazing permittees where little or no conflict has occurred.

#### **Visual Resources – Present, Not Impacted**

Under the RMP, the Eagle Eye Complex is allocated to Visual Resource Management (VRM) Classes III. VRM Class III objective is to partially retain the existing character of the landscape, with a moderate level of change. None of the proposed actions would alter the landscape beyond the objectives of the VRM Class. Grazing practices would continue as they have in the past. The proposed action would authorize construction of the riparian fence; however, this would not change the character of the existing landscape. VRM objectives for the allotment would be met under all alternatives.

#### **Urban Quality, Historic and Cultural Resources, and the Design of the Built Environment – Not Present**

CEQ requires that analysis of environmental consequences must discuss potential effects to urban quality, historic and cultural resources, and the design of the built environment, including the reuse and conservation potential of various alternatives and mitigation measures (40 CFR 1502.16(g)). The proposed action would have no impact on these resources.

#### **Wild Horses and Burros – Present, Not Impacted**

Wild horses or burros are present on the Complex, but no herd management area is associated with the project area. No impacts to wild burros are expected.

#### **Wild and Scenic Rivers – Not Present**

There are no river segments within the allotment that are designated, eligible, or suitable, as wild, scenic, or recreational under the Wild and Scenic Rivers Act.

#### **Wilderness**

There are no wilderness areas that occur within any of the Eagle Eye Complex allotments.

## Chapter 4: Consultation

The BLM conducts scoping to solicit internal and external input on the potential issues, impacts, and alternatives that may be addressed in an EIS or EA. The BLM conducted scoping on this EA concurrently with taking comments on the 2015 Eagle Eye Complex RHE. External scoping was conducted via letter sent to the Consultation, Coordination, and Cooperation list, including State agencies, Federal agencies, and interested publics. Recipients were asked to comment on the draft RHEs as well as the Proposed Action presented in this EA. The scoping period for the Eagle Eye Complex was December 15<sup>th</sup> to January 15<sup>th</sup> 2016. No external scoping responses were received.

### List of Preparers

Name	Title
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# **Appendix A: Arizona's Standards for Rangeland Health and Guidelines for Grazing Administration**

## **INTRODUCTION**

The Department of the Interior's final rule for Grazing Administration, issued on February 22, 1995, and effective August 21, 1995, requires that Bureau of Land Management (BLM) State Directors develop State or regional standards and guidelines for grazing administration in consultation with BLM Resource Advisory Councils (RAC), other agencies and the public. The final rule provides that fallback standards and guidelines be implemented, if State standards and guidelines are not developed by February 12, 1997. Arizona Standards and Guidelines and the final rule apply to grazing administration on public lands as indicated by the following quotation from the Federal Register, Volume 60, Number 35, page 9955.

"The fundamentals of rangeland health, guiding principles for standards and the fallback standards address ecological components that are affected by all uses of public rangelands, not just livestock grazing. However, the scope of this final rule, and therefore the fundamentals of rangeland health of §4180.1, and the standards and guidelines to be made effective under §4180.2, are limited to grazing administration."

Although the process of developing standards and guidelines applies to grazing administration, present rangeland health is the result of the interaction of many factors in addition to grazing by livestock. Other contributing factors may include, but are not limited to, past land uses, land use restrictions, recreation, wildlife, rights-of-way, wild horses and burros, mining, fire, weather, and insects and disease. With the commitment of BLM to ecosystem and interdisciplinary resource management, the standards for rangeland health as developed in this current process will be incorporated into management goals and objectives. The standards and guidelines for rangeland health for grazing administration, however, are not the only considerations in resolving resource issues.

The following quotations from the Federal Register, Vol. 60, No. 35, page 9956, February 22, 1995, describe the purpose of standards and guidelines and their implementation:

"The guiding principles for standards and guidelines require that State or regional standards and guidelines address the basic components of healthy rangelands. The Department believes that by implementing grazing-related actions that are consistent with the fundamentals of §4180.1 and the guiding principles of §4180.2, the long-term health of public rangelands can be ensured.

"Standards and guidelines will be implemented through terms and conditions of grazing permits, leases, and other authorizations, grazing-related portions of activity plans (including Allotment Management Plans), and through range improvement-related activities.

"The Department anticipates that in most cases the standards and guidelines themselves will not be terms and conditions of various authorizations but that the terms and conditions will reflect the standards and guidelines.

"The Department intends that assessments and corrective actions will be undertaken in priority order as determined by BLM.

"The Department will use a variety of data including monitoring records, assessments, and knowledge of the locale to assist in making the "significant progress" determination. It is anticipated that in many cases it will take numerous grazing seasons to determine direction and magnitude of trend. However, actions will be taken to establish significant progress toward conformance as soon as sufficient data are available to make informed changes in grazing practices."

## FUNDAMENTALS AND DEFINITION OF RANGELAND HEALTH

The Grazing Administration Regulations, at §4180.1 (43 Code of Federal Regulation [CFR] 4180.1), Federal Register Vol. 60, No. 35, pg. 9970, direct that the authorized officer ensures that the following conditions of rangeland health exist:

(a) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.

(b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.

(c) Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives such as meeting wildlife needs.

(d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This Committee defined Rangeland Health ". . . as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." This committee emphasized ". . . the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The Committee also recommended that "The determination of whether a rangeland is healthy, at risk, or unhealthy should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

Standards describe conditions necessary to encourage proper functioning of ecological processes on specific ecological sites. An ecological site is the logical and practical ecosystem unit upon which to base an interpretation of rangeland health. Ecological site is defined as:

". . . a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management" (Journal of Range Management, 48:279, 1995). Ecological sites result from the interaction of climate, soils, and landform (slope, topographic position). The importance of this concept is that the "health" of different kinds of rangeland must be judged by standards specific to the potential of the ecological site. Acceptable erosion rates, water quality, productivity of plants and animals, and other features are different on each ecological site.

Since there is wide variation of ecological sites in Arizona, standards and guidelines covering these sites must be general. To make standards and guidelines too specific would reduce the ability of BLM and interested publics to select specific objectives, monitoring strategies, and grazing permit terms and conditions appropriate to specific land forms.

Ecological sites have the potential to support several different plant communities. Existing communities are the result of the combination of historical and recent uses and natural events. Management actions may be used to modify plant communities on a site. The desired plant community for a site is defined as follows: "Of the several plant communities that may occupy a site, the one that has been identified

through a management plan to best meet the plan's objectives for the site. It must protect the site as a minimum." (Journal of Range Management, 48:279, 1995.)

Fundamentals (a) and (b) define physical and biological components of rangeland health and are consistent with the definition of rangeland health as defined by the Committee on Rangeland Classification, Board on Agriculture, National Research Council, as discussed in the paragraph above. These fundamentals provide the basis for sustainable rangelands.

Fundamentals (c) and (d) emphasize compliance with existing laws and regulation and, therefore, define social and political components of rangeland health. Compliance with Fundamentals (c) and (d) is accomplished by managing to attain a specific plant community and associated wildlife species present on ecological sites. These desired plant communities are determined in the BLM planning process, or, where the desired plant community is not identified, a community may be selected that will meet the conditions of Fundamentals (a) and (b) and also adhere to laws and regulations. Arizona Standard 3 is written to comply with Fundamentals (c) and (d) and provide a logical combination of Standards and Guidelines for planning and management purposes.

## STANDARD AND GUIDELINE DEFINITIONS

**Standards** are goals for the desired condition of the biological and physical components and characteristics of rangelands. Standards:

- (1) are measurable and attainable; and
- (2) comply with various Federal and State statutes, policies, and directives applicable to BLM Rangelands.

**Guidelines** are management approaches, methods, and practices that are intended to achieve a standard. Guidelines:

- (1) typically identify and prescribe methods of influencing or controlling specific public land uses;
- (2) are developed and applied consistent with the desired condition and within site capability; and
- (3) may be adjusted over time.

## IMPLEMENTING STANDARDS AND GUIDELINES

The authorized officer will review existing permitted livestock use, allotment management plans, or other activity plans which identify terms and conditions for management on public land. Existing management practices and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet, or are making significant progress toward meeting, the standards and are in conformance with the guidelines. The review will be interdisciplinary and conducted under existing rules which provide for cooperation, coordination, and consultation with affected individuals, federal, state, and local agencies, tribal governments, private landowners, and interested publics.

This review will use a variety of data, including monitoring records, assessments, and knowledge of the locale to assist in making the significant progress determination. Significance will be determined on a case by case basis, considering site potential, site condition, weather and financial commitment. It is anticipated there will be cases where numerous years will be needed to determine direction and magnitude of trend.

Upon completion of review, the authorized officer shall take appropriate action as soon as practicable but no later than the start of the next grazing year upon determining that the existing grazing management practices or level of use on public land are significant factors contributing to failure to achieve the standards and conform with the guidelines that are made effective under 43 CFR 4180.2. Appropriate

action means implementing actions that will result in significant progress toward fulfillment of the standards and significant progress toward conformance with guidelines.

Livestock grazing will continue where significant progress toward meeting standards is being made. Additional activities and practices would not be needed on such allotments. Where new activities or practices are required to assure significant progress toward meeting standards, livestock grazing use can continue contingent upon determinations from monitoring data that the implemented actions are effective in making significant progress toward meeting the standards. In some cases, additional action may be needed as determined by monitoring data over time.

New plans will incorporate an interdisciplinary team approach (Arizona BLM Interdisciplinary Resource Management Handbook, April 1995). The terms and conditions for permitted grazing in these areas will be developed to comply with the goals and objectives of these plans which will be consistent with the standards and guidelines.

## ARIZONA STANDARDS AND GUIDELINES

Arizona Standards and Guidelines (S&G) for grazing administration have been developed through a collaborative process involving the Bureau of Land Management State S&G Team and the Arizona Resource Advisory Council. Together, through meetings, conference calls, correspondence, and Open Houses with the public, the BLM State Team and RAC prepared Standards and Guidelines to address the minimum requirements outlined in the grazing regulations. The Standards and Guidelines, criteria for meeting Standards, and indicators are an integrated document that conforms to the fundamentals of rangeland health and the requirements of the regulations when taken as a whole.

Upland sites, riparian-wetland areas, and desired resource conditions are each addressed by a standard and associated guidelines.

### **Standard 1: Upland Sites**

Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).

#### **Criteria for meeting Standard 1:**

Soil conditions support proper functioning of hydrologic, energy, and nutrient cycles. Many factors interact to maintain stable soils and healthy soil conditions, including appropriate amounts of vegetative cover, litter, and soil porosity and organic matter. Under proper functioning conditions, rates of soil loss and infiltration are consistent with the potential of the site.

Ground cover in the form of plants, litter or rock is present in pattern, kind, and amount sufficient to prevent accelerated erosion for the ecological site; or ground cover is increasing as determined by monitoring over an established period of time.

Signs of accelerated erosion are minimal or diminishing for the ecological site as determined by monitoring over an established period of time.

#### **As indicated by such factors as:**

##### Ground Cover

- litter
- live vegetation, amount and type (e.g., grass, shrubs, trees, etc.)
- rock

##### Signs of erosion

- flow pattern
- gullies
- rills
- plant pedestaling

**Exceptions and exemptions (where applicable):**

None

**Guidelines:**

1-1. Management activities will maintain or promote ground cover that will provide for infiltration, permeability, soil moisture storage, and soil stability appropriate for the ecological sites within management units. The ground cover should maintain soil organisms and plants and animals to support the hydrologic and nutrient cycles, and energy flow. Ground cover and signs of erosion are surrogate measures for hydrologic and nutrient cycles and energy flow.

1-2. When grazing practices alone are not likely to restore areas of low infiltration or permeability, land management treatments may be designed and implemented to attain improvement.

**Standard 2: Riparian-Wetland Sites**

Riparian-wetland areas are in properly functioning condition.

**Criteria for meeting Standard 2:**

Stream channel morphology and functions are appropriate for proper functioning condition for existing climate, landform, and channel reach characteristics. Riparian-wetland areas are functioning properly when adequate vegetation, land form, or large woody debris is present to dissipate stream energy associated with high water flows.

Riparian-wetland functioning condition assessments are based on examination of hydrologic, vegetative, soil and erosion-deposition factors. BLM has developed a standard checklist to address these factors and make functional assessments. Riparian-wetland areas are functioning properly as indicated by the results of the application of the appropriate checklist.

The checklist for riparian areas is in Technical Reference 1737-9 "Process for Assessing Proper Functioning Condition." The checklist for wetlands is in Technical Reference 1737-11 "Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas."

**As indicated by such factors as:**

- Gradient
- Width/depth ratio
- Channel roughness and sinuosity of stream channel
- Bank stabilization
- Reduced erosion
- Captured sediment
- Ground-water recharge
- Dissipation of energy by vegetation

**Exceptions and exemptions (where applicable):**

- Dirt tanks, wells, and other water facilities constructed or placed at a location for the purpose of providing water for livestock and/or wildlife and which have not been determined through local planning efforts to provide for riparian or wetland habitat are exempt.
- Water impoundments permitted for construction, mining, or other similar activities are exempt.

**Guidelines:**

2-1. Management practices maintain or promote sufficient vegetation to maintain, improve or restore riparian-wetland functions of energy dissipation, sediment capture, groundwater recharge and stream bank stability, thus promoting stream channel morphology (e.g., gradient, width/depth ratio, channel roughness and sinuosity) and functions appropriate to climate and landform.

2-2. New facilities are located away from riparian-wetland areas if they conflict with achieving or maintaining riparian-wetland function. Existing facilities are used in a way that does not conflict with riparian-wetland functions or are relocated or modified when incompatible with riparian-wetland functions.

2-3. The development of springs and seeps or other projects affecting water and associated resources shall be designed to protect ecological functions and processes.

**Standard 3: Desired Resource Conditions**

Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

**Criteria for meeting Standard 3:**

Upland and riparian-wetland plant communities meet desired plant community objectives. Plant community objectives are determined with consideration for all multiple uses. Objectives also address native species, and the requirements of the Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, Clean Water Act, and appropriate laws, regulations, and policies.

Desired plant community objectives will be developed to assure that soil conditions and ecosystem function described in Standards 1 and 2 are met. They detail a site-specific plant community, which when obtained, will assure rangeland health, State water quality standards, and habitat for endangered, threatened, and sensitive species. Thus, desired plant community objectives will be used as an indicator of ecosystem function and rangeland health.

**As indicated by such factors as:**

- Composition
- Structure
- Distribution

**Exceptions and exemptions (where applicable):**

Ecological sites or stream reaches on which a change in existing vegetation is physically, biologically, or economically impractical.

**Guidelines:**

3-1. The use and perpetuation of native species will be emphasized. However, when restoring or rehabilitating disturbed or degraded rangelands, non-intrusive, non-native plant species are appropriate for use where native species (a) are not available, (b) are not economically feasible, (c) cannot achieve ecological objectives as well as non-native species, and/or (d) cannot compete with already established non-native species.

3-2. Conservation of Federal threatened or endangered, proposed, candidate, and other special status species is promoted by the maintenance or restoration of their habitats.

3-3. Management practices maintain, restore, or enhance water quality in conformance with State or Federal standards.

3-4. Intensity, season and frequency of use, and distribution of grazing use should provide for growth and reproduction of those plant species needed to reach desired plant community objectives.

3-5. Grazing on designated ephemeral (annual and perennial) rangeland may be authorized if the following conditions are met:

- ephemeral vegetation is present in draws, washes, and under shrubs and has grown to useable levels at the time grazing begins;
- sufficient surface and subsurface soil moisture exists for continued plant growth;
- serviceable waters are capable of providing for proper grazing distribution;
- sufficient annual vegetation will remain on site to satisfy other resource concerns, (i.e., watershed, wildlife, wild horses and burros); and
- monitoring is conducted during grazing to determine if objectives are being met.

3-6. Management practices will target those populations of noxious weeds which can be controlled or eliminated by approved methods.

3-7. Management practices to achieve desired plant communities will consider protection and conservation of known cultural resources, including historical sites, and prehistoric sites and plants of significance to Native American peoples.



**Appendix B**

# Rangeland Health Evaluation

Eagle Eye Allotment #3027

6Y Ranch Lease Allotment #5042

Christopherson Allotment #5025

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<a href="#">2.2 Effus Allotment</a> .....	Error! Bookmark not defined.
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[5.0 Eagle Eye Complex Ecological Sites](#)..... **Error! Bookmark not defined.**

## **Abstract**

This Rangeland Health Evaluation is a stand-alone report designed to ascertain compliance with the Arizona Standards for Rangeland Health on the Eagle Eye, 6Y Ranch Lease, and Christopherson grazing allotments.

Standard One is achieved on this complex of allotments.

Standard Two is not applicable to these allotments.

Standard Three is achieved on this complex of allotments.

## **1.0 Introduction**

The purpose of this draft land health evaluation is to gauge whether the Arizona Standard of Rangeland Health (Standards) are being achieved on the Eagle Eye, 6Y, and Christopherson grazing allotments (hereafter the “Eagle Eye Complex” or “Complex”) and to determine if livestock are the causal factor for either not achieving or not making significant progress towards achieving land health standards in the case of non-achievement of Standards. An evaluation is not a decision document, but a standalone report that clearly records the analysis and interpretation of the available inventory and monitoring data. As part of the land health assessment process Desired Plant Community (DPC) objectives were established for the Biological Resources (biological objects within the boundaries of the allotments). The DPC objectives will assure that soil condition and ecosystem function described in Standards 1 and 2 are met.

The Secretary of the Interior approved Arizona’s Standards for Rangeland Health and Guidelines for Grazing Administration (Guidelines) in April 1997. The Decision Record, signed by the BLM State Director (April 1997) provides for full implementation of the Standards and Guides in Arizona BLM Land Use Plans. See Appendix B for Arizona’s Standards for Rangeland Health.

Land Health Standards are measurable and attainable goals for the desired condition of the biological resources and physical components/characteristics of the desert ecosystems found within the boundaries of these grazing allotments.

This evaluation seeks to ascertain: 1) if standards are being achieved, not achieved, and, in cases of not achieved, if significant progress is being made towards achievement of land health. 2) Where it is ascertained that land health standards are not being achieved, determine whether livestock grazing is a significant factor causing that non-achievement.

## **2.0 Complex Profile**

### **2.1 Complex Location**

The Eagle Eye Complex is located south to east of the town of Aguila, Arizona. Eagle Eye and Aguila roads lie on the western side of the complex. Acreages for the allotments within the complex are given in Section 2.2.1, below. A map of the Complex allotments is available in Appendix A.

### **2.2 Physical Description**

#### **2.2.1 Allotment Acreages**

The acreages of the allotments within the Eagle Eye Complex are given below.

Land Classification	Eagle Eye Allotment	6Y Allotment	Christopherson Allotment
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Public Acres	3858	2873	9162
State Acres	957	1278	6361
Private Land Acres	980	0	89
Total Acres	5795	4151	15612

### 2.2.2 Climate Data

Climate data for this allotment are taken from the Western Regional Climate Center data available at [www.wrcc.dri.edu](http://www.wrcc.dri.edu). The data are based on the National Oceanic and Atmospheric Administration (NOAA) site located in Wickenburg, AZ due east of the complex. Average mean air temperature at this site is 65.7°F, with an average of 150.4 days per year at a daily maximum temperature above 90°F and 61.2 days a year with a daily minimum below 32°F. This is consistent with the Natural Resource Conservation Service (NRCS) Agricultural Handbook 296, which describes the climate of the area as:

*“The average annual air temperature is 58 to 74 degrees F (15 to 23 degrees C). The freeze-free period averages 285 days and ranges from 205 to 365 days, decreasing in length with increasing elevation.” (USDA 2006)*

### 2.2.3 Precipitation

Precipitation data for the Eagle Eye Complex is taken from the Maricopa County Flood Control District (MCFCD). MCFCD maintains a network of rain, streamflow, and weather stations within the watershed in and surrounding Maricopa County, with publicly available historic station data. The stations below were used in the calculation of precipitation on the Complex:

Station Name	Station Number	Lat	Long	Years of Record	Mean Annual Rainfall
Grass Wash at US 60	5155	33.9401	-113.188	13	7.36
Upper Grass Wash	5145	33.8776	-113.091	12	8.23
Dead Horse Wash	5195	33.781	-113.029	14	7.65
Centennial Wash	5180	33.94325	-113.001	33	8.01
Twin Peaks	5250	33.8836	-112.823	12	8.76
Harquahala Mountain	5185	33.8121	-113.347	21	12.09
Gladden	5170	33.9028	-113.298	32	7.28

### 2.2.4 Soils Data

Soils data for the Complex are taken from the NRCS soil survey of the Aguila-Carefree area (1986). The soils data is limited to public lands within the complex, and does not include soils present on State trust or privately held lands.

The most dominant soil map unit within the complex is the Mohave loam, calcareous solum, 0-8 percent slope, making up 13.8 percent of the area. This is a well-drained soil on fan terraces, basin floors and stream terraces. The soil is derived from mixed alluvium with a depth 60 inches or more. The ecological site associated with this soil is the Limy Fan 7-10”pz (R040XB207AZ).

The second most dominant soil within the complex is the Guest Clay, making up 11.7 percent of the area. Guest soils are well drained soils on flood plains. The soil is derived from alluvium dominants from acid

and basic igneous rock with a depth of 60 inches or more. The ecological site associated with these soils is the Clayey Swale 7-10”pz (R040XB203AZ).

The third most dominant soil within the complex is the Mohave-Guest complex, making up 10.8 percent of the area. The Mohave soils are well drained soils on fan terraces and flood plains. The soil is derived from alluvium with a depth of 60 inches or more. The ecological site associated with these soils is the Loamy Upland 7-10”pz (R040XB213AZ). Guest soils are well drained soils on flood plains. The soil is derived from alluvium dominants from acid and basic igneous rock with a depth of 60 inches or more. The ecological site associated with these soils is the Clayey Swale 7-10”pz (R040XB203AZ).

The fourth most dominant soil within the complex is the Pinaleno-Tres Hermanos complex, 1-10 percent slopes, making up 8.9 percent of the area. Pinaleno soils are well drained soils on fan and stream terraces. The soil is derived from fan alluvium of mixed rock with a depth of 24 to 60 inches. The ecological site associated with this soil is the Clay Loam Upland 7-10”pz (R040XB205AZ). The Tres Hermanos soils are well-drained soils on alluvial fans and footslopes. The soil is derived from alluvium mainly from igneous rocks with a depth of 40 to 45 inches. The ecological site associated with this soil is the Loamy Upland 7-10”pz (R040XB213AZ).

The fifth most dominant soil within the complex is the Continental-Mohave complex, 1-3 percent slopes, making up 8.3 percent of the area. Continental soils are well drained soils on fan terraces. The soil is derived from alluvium from mixed sources with a depth of 60 inches or more. The ecological site associated with this soil is the Clay Loam Upland 7-10”pz (R040XB205AZ). The Mohave soils are well drained soils on fan terraces and flood plains. The soil is derived from alluvium with a depth of 60 inches or more. The ecological site associated with these soils is the Loamy Upland 7-10”pz (R040XB213AZ).

The sixth most dominant soil within the complex is the Greyeagle-Continental-Nickel association, 1-40 percent slopes, making up 6.8 percent of the area. Greyeagle soils are somewhat excessively drained soils on fan terraces and hillslopes. The soil is derived from mixed alluvium with a depth of 24-60 inches. The ecological site associated with this soil is the Clay Loam Upland 7-10”pz (R040XB205AZ). Continental soils are well drained soils on fan terraces. The soil is derived from alluvium from mixed sources with a depth of 27-60 inches. The ecological site associated with this soil is the Clay Loam Upland 7-10”pz. Nickel soils are well drained soils on fan remnants. The soil is derived from alluvium from mixed rock sources with a depth of 31-60 inches. The ecological site associated with this soil is the Limy Upland 7-10”pz (R040XB210AZ).

The seventh most dominant soil within the complex is the Lehman's-Rock outcrop complex, 8-65 percent slopes, making up 6.4 percent of the area. These are well drained soils on pediments and hills. The soil is derived from slope alluvium from volcanic rock with a depth of 14 inches. The ecological site associated with this soil is the Volcanic Hills 7-10”pz (R040XB210AZ).

The remainder of the soil types present on the allotment include the Continental clay loam, Eba very gravelly loam, Gran soils, Wickenburg soils, Ohaco gravelly loams, and multiple complexes of these and the above described soils.

## **2.3 Biological Resources**

### **2.3.1 Major Land Resource Areas**

The Eagle Eye Complex lies within Major Land Resource Area (MLRA) 40, Sonoran Basin and Range. MLRAs are described in USDA NRCS Agriculture Handbook 296: “Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin” (2006). MRLAs

describe, on a large-landscape scale, the physiography, geology, climate, water, soils, biological resources and general land use.

Ecological Site Descriptions produced by the NRCS are organized by MLRA for reference purposes.

### **2.3.2 Ecological Sites**

An ecological site is a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. It is the product of all the environmental factors responsible for its development, and it has a set of key characteristics (soils, hydrology, and vegetation) that are included in the ecological site description. Development of the soils, hydrology, and vegetation are all interrelated. Each is influenced by the other and influences the development of the others. (TR 1734-07, Ecological Site Inventory)

Ecological sites are named and classified based on soil parent material or soil texture and precipitation. There are several ecological sites that occur within the Eagle Eye Complex. The dominant ecological sites on Public lands within the complex are described below. Reference Map 3, Appendix A, for ecological sites occurring on the complex.

NRCS provides Ecological Site Descriptions online at <https://esis.sc.egov.usda.gov/>.

#### Limy Fan 7-10”pz R040XB207AZ

This site occurs on fan and stream terraces with slopes ranging from 1-3% and elevations from 1000’ to 2000’. Soils are deep and formed in loamy alluvium of moderate age and mixed origins. Plant-soil moisture relationships are poor to fair. The potential plant community is a mixture of desert shrubs, cacti, and annual forbs and grasses. Annual vegetative production is expected to be between 176-455lbs air-dry weight per acre.

#### Clayey Swale 7-10”pz R040XB203AZ

This site occurs on floodplains and alluvial fans with slopes ranging from 0-2% and elevations from 1100’ to 2200’. Soils are deep and formed on clayey alluvium of mixed origins. Plant-soil moisture relationships on the site are very good. The potential plant community on the site is dominated by tobosa grass. Annual forbs and grasses are common. Annual vegetative production is expected to be between 712-880lbs air-dry weight per acre.

#### Loamy Upland 7-10”pz R040XB213AZ

This site occurs on fan and stream terraces with slopes ranging from 1-15% and elevations from 1000’ to 2200’. Soils are deep and formed in loamy alluvium of mixed origins. Plant-soil moisture relationships on this site are fair. The potential plant community is a mixture of desert shrubs, cacti, and annual grasses and forbs. Perennial grasses and forbs are a minor component of the community. Annual vegetative production is expected to be between 300-500lbs air-dry weight per acre.

#### Clay Loam Upland 7-10”pz R040XB205AZ

This site occurs on fan and stream terraces with slopes ranging from 1-3% and elevations from 1000’ to 2050’. Soils are deep and formed in clayey alluvium of mixed origins. Plant-soil moisture relationships on this site are fair. The potential plant community is a mix of grass, forbs, desert shrubs and cacti. Annual vegetative production is expected to be between 300-460lbs air-dry weight per acre.

#### Volcanic Hills 7-10”pz R040XB210AZ

This site occurs on hillslopes and ridge tops with slopes ranging from 15-65% and elevations from 1000’ to 2500’. Soils are shallow and formed on intermediate igneous material. Soils are slightly calcareous, loamy textured and have very well developed covers of cobble, stones and gravel. Rock outcrops can account for up to 35% of the area. Plant-soil moisture relationships are fair to good. The potential plant



community is a diverse mixture of desert shrubs, trees and cacti with limited perennial grass. Annual vegetative production is expected to be between 450-575lbs air-dry weight per acre.

**2.3.3 General Wildlife Resources**

Wildlife species that occur within the Eagle Eye Complex are typical and representative of the vegetative communities present in the area. Species present include, but are not limited to, mule deer, coyote, javelina, mountain lion, bobcat, gray fox, raccoon, desert cottontail, black-tailed jackrabbits, Gambel’s quail, great horned owls, and various reptiles, small mammals and migratory birds.

**2.3.4 Special Status Species, T&E**

Sonoran desert tortoises (*Gopherus morafkai*), a BLM sensitive species, occupy much of the upland areas in the Eagle Eye Complex. The desert tortoise distribution within the Complex is not uniform. Tortoises tend to occupy hillsides and ridges with outcrops of large boulders as well as areas with incised washes and caliche caves, but may be found in lower densities throughout the area. Tortoises generally use natural and excavated cover sites between or under boulders and in caliche caves along washes wherever they occur. Their diet consists of annual forbs (30.1%), perennial forbs (18.3%), grasses (27.4%), woody plants (23.2%) and prickly pear fruit (1.1%) (Van Devender, et al. 2002).

The Eagle Eye complex contains category I, II, and III desert tortoise habitat. Category I habitat is defined as: 1) Habitat that is essential to the maintenance of large, viable populations; 2) Habitat where conflicts are resolvable; and 3) Habitat that contains medium to high densities of tortoises or low densities contiguous with medium or high densities. Category II habitat is defined as: 1) Habitat that may be essential to the maintenance of viable populations; 2) Habitat where most conflicts are resolvable; and 3) Habitat that contains medium to high densities of tortoises or low densities contiguous with medium or high densities. Category III habitat is defined as: 1) Habitat that is not considered essential to the maintenance of viable populations; 2) Habitat where most conflicts are not resolvable; and 3) Habitat that contains low to medium densities of tortoises not contiguous with medium or high densities. The table below shows the acreages of desert tortoise habitat on public lands within the complex.

Allotment	Category 1 Acres	Category 2 Acres	Category 3 Acres
Eagle Eye	1855	0	2003
6 Y	0	1240	1633
Christopherson	0	5898	3265

**2.4 Special Management Areas**

The Eagle Eye allotment contains 334 acres of the Harquhala ACEC.

**2.5 Recreational Resources**

The complex contains 56.8 miles of existing routes, which are all currently open to all travel modes.

By allotment, miles of routes in each are as follows:

Eagle Eye - 21.4 miles total

15.3 miles are managed by the BLM as primitive roads. 6.1 miles are Maricopa County Roads consisting of Aguila Road and Eagle Eye Road.

6Y Ranch Lease – 8.0 miles total  
All 8.0 miles are managed by the BLM as primitive roads.

Christopherson - 27.4 miles total  
All 27.4 miles are managed by the BLM as primitive roads.

#### General public access

Public access generally coincides with routes permitted for use the grazing permittees. Minor maintenance of the existing routes is generally welcomed by the public. Major upgrades to the existing routes are less welcome due to the recreationists' expectation for rough, minimally maintained roads. Improving roads to a higher standard is generally perceived by the public, and the BLM, to invite vandals and new uses which may leave trash or displace authorized use. Improving access can have the effect of increasing use of an area which was previously lightly used, leading to increased litter and increasing impacts to vegetation and water quality.

## 3.0 Grazing Management

### 3.1 Grazing History

The current permit and lease holder for the Eagle Eye and 6Y Ranch Lease allotments is the Serrano family. They acquired the allotments in 1989. The Christopherson permit is held by the Shiew family. They acquired the allotment in 2004.

BLM billing records show continuous use on these grazing allotments since the 1960s. Livestock have likely been present in this area since the mid-1800s.

### 3.2 Mandatory Terms and Conditions for Permitted Use

The 6Y Ranch Lease and Christopherson allotments are classified as perennial allotments. Grazing occurs year-long at varying levels of intensity. The Eagle Eye allotment is classified as ephemeral. Grazing occurs infrequently during periods of annual vegetation production. The Mandatory Terms and Conditions of the permits and leases are listed below:

Allotment Name	Allotment Number	Livestock Number	Livestock Kind	%PL	Type Use	AUMs
Eagle Eye	03027	0	Cattle	67	Ephemeral	0
6Y Ranch Lease	05042	25	Cattle	71	Active	213
Christopherson	05025	156	Cattle	73	Active	1367

## 4.0 Objectives

### 4.1 Relevant Planning and Environmental Documents

The Taylor Grazing Act of 1934 provides for two types of authorized use: (1) A *grazing permit*, which is a document authorizing use of the public lands within an established grazing district, and are

administered in accordance with Section 3 of the Taylor Grazing Act; and (2) a *grazing lease*, which is a document authorizing use of the public lands outside an established grazing district, and are administered in accordance with Section 15 of the Taylor Grazing Act. The Eagle Eye allotment is a Section 3 grazing permit; the 6Y Ranch Lease and Christopherson allotments are Section 15 grazing leases.

The BLM is responsible for establishing the appropriate levels and management strategies for livestock grazing in these allotments. Grazing permits issued must be in compliance with the multiple use and sustained yield concepts of FLPMA and the Fundamentals of Rangeland Health (43 CFR 4180), and be in accordance with the Guidelines for Grazing Administration while continuing to achieve Arizona Standards for Rangeland Health.

*Land Health Standards:*

On April 28, 1997, the Secretary of Interior approved the implementation of the *Arizona Standards for Rangeland Health and Guidelines for Grazing Administration* for all Land Use Plans in Arizona. The purpose of the Standards and Guidelines is to maintain or improve the health of the public rangelands. Standards and guidelines are intended to help the Bureau, rangeland users and others focus on a common understanding of acceptable resource conditions and work together to achieve that vision. Standards and Guidelines were incorporated into Phoenix District land use plans in 1997 and into the *Bradshaw-Harquahala RMP* in 2010.

As defined by the Arizona Resource Advisory Council, “Standards” are goals for the desired condition of the biological and physical components and characteristics of rangelands. “Guidelines” are management approaches, methods, and practices that are intended to achieve a standard. Guidelines are developed and applied consistent with the desired condition and within the site’s capability and specific public land uses, and may be adjusted over time. Arizona S&Gs are defined as the following:

**Standard 1 - Upland Sites**

*Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).*

**Standard 2 - Riparian - Wetland Site**

*Riparian-wetland areas are in proper functioning condition.*

**Standard 3 - Desired Resource Conditions**

*Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.*

The Bradshaw-Harquahala Resource Management Plan (2010) contains additional desired future condition objectives for wildlife special status species. For the Eagle Eye Complex, the desired future condition objectives for Sonoran desert tortoise are applicable. These objectives are given below:

*“TE-3. In Category I and II areas, vegetation will consist of at least 5 percent native perennial grasses, at least 10 percent native perennial forbs or subshrubs, at least 30 percent native trees and cacti, by dry weight, as limited by the potential of the ecological site as described by the Natural Resource Conservation Service (NRCS) ecological site guides.”*

## 4.2 Key Area Objectives

Specific Key Area objectives step down from the Desired Future Condition objectives found in the Bradshaw-Harquahala RMP (2010). These Key Area specific objectives are designed to assess Public Land conformance to the Arizona Standards for Rangeland Health on the Eagle Eye Complex.

There are 5 active Key Areas on the Eagle Eye Complex. The Eagle Eye allotment contains 1 Key Area. The 6Y Ranch Lease and Christopherson allotments each contain 2 Key Areas. Christopherson Key Area 1 is on State Trust Lands and was replaced by Key Area 3 approximately 200 yards west of the original key area. The table below shows the active key areas on the complex:

Allotment	Key Area	Ecological Site
Eagle Eye	KA1	Loamy Upland 7-10"pz
6Y Ranch Lease	KA1	Clayey Swale 7-10"pz
	KA2	Loamy Upland 7-10"pz
Christopherson	KA2	Clayey Swale 7-10"pz
	KA3	Limy Fan 7-10"pz

Desired Plant Community (DPC) Objectives were developed for each Key Area within the Complex by an interdisciplinary team of BLM resource specialists and biologists. These objectives are designed to maintain or improve the biotic integrity of the Public Lands, provide for wildlife habitat, and provide for usable forage as limited by the potential of the ecological site. These objectives, and the rationale for each objective, are given below.

### 4.2.1 Standard 1- Upland Sites, applies to all key areas.

Objective: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site). (Bradshaw-Harquahala RMP decision LH-1)

Soil erosion on the key area is appropriate to the ecological site on which it is located. Factors indicating conformance to Standard 1 include ground cover, litter, vegetative foliar cover, flow patterns, rills, and plant pedestalling in accordance to developed NRCS Ecological Site Guides and/or Reference Sheets. Deviations that are "slight" or "slight to moderate" from the appropriate site guide or reference are considered meeting the Standard. Departures of Moderate or greater will not meet the Standard except in cases where the departure is documented as showing an improvement of land health over what is expected on a reference site.

### 4.2.2 Standard 3- Desired Resource Condition Objectives

Objective: Productive, diverse upland and riparian-wetland plant communities exist and are maintained.

DPC objectives detail a site-specific plant community, which, when obtained, will assure rangeland health, State water quality standards, and habitat for endangered, threatened and sensitive species. Because DPC objectives are site-specific, Key Areas located on similar stratum may have difference DPC objectives. This is due to differences in slope, elevation, aspect and rainfall factors, as well as other site potential limiting factors such as prior disturbance, rock outcroppings, or heavy gravel cover. The recommended palatable shrub and grass compositions will provide for adequate wildlife forage on the site

for species such as Sonoran desert tortoise, mule deer, quail, and other non-game wildlife species. The foliar cover and bare ground cover class objectives will provide thermal and hiding cover for wildlife species and will prevent accelerated erosion on the sites.

Sonoran desert tortoise habitat requirements are listed in the Bradshaw-Harquahala RMP. The DPC objectives for each key area are consistent with the Sonoran desert tortoise habitat requirements based on the potential for the site.

#### *Eagle Eye Allotment*

Key Area 1, Loamy Upland 7-10" ecological site:

- Maintain a palatable shrub composition at  $\geq 20\%$
- Maintain a foliar cover of  $\geq 15\%$
- Maintain a bare ground cover class of  $\leq 40\%$

Rationale:

This Key Area is located on a terrace at an elevation of approximately 2270'.

Rationale is taken from the NRCS Loamy Upland ecological site guide and reference sheet. Both the ecological site guide and reference sheet state that perennial grasses make up a minor component of this ecological site. While perennial grass was present on the site, a perennial grass DPC objective was not set due to the low grass cover on the site and a limited potential for grass recruitment. The ecological site guide calls for shrub composition from 45-75% for all species. When considering species that are palatable to wildlife, maintaining a palatable shrub composition of equal to or greater than 20% is appropriate to the site and falls within the guidelines of the ESD. The reference sheet shows a canopy cover class between 15-25%. Due to this site being on the lower end of the ESD rainfall range, a foliar cover class of 15% is appropriate to the site and within the ranges provided in the reference state. The reference sheet calls for a bare ground cover class between 10-60%, dependent upon annual rainfall. A bare ground cover class of less than or equal to 40% is appropriate to the site given its rainfall regime and the reference state.

#### *6Y Ranch Lease Allotment*

Key Area 1, Clayey Swale 7-10"pz ecological site:

- Maintain a perennial grass composition of  $\geq 70\%$
- Maintain a foliar cover of  $\geq 30\%$
- Maintain a bare ground cover class of  $\leq 35\%$

Rationale:

This Key Area is located on a terrace at an elevation of approximately 2200'.

Rationale for DPC objectives is taken from the NRCS Clayey Swale ecological site guide and reference sheet. The ecological site guide shows a perennial grass composition of 60-68% at historic climax plant community, and the reference sheet shows 85-90% of the canopy cover is perennial grasses in the reference state. The perennial grass objective of 70% composition slightly exceeds the historic climax plant community but is based on the low shrub and tree cover present on the site. The reference sheet calls for a canopy cover between 20-30%. The foliar cover objective falls within this range. In the reference state, the bare ground ranges from 20-60%. The bare ground cover class objective falls within this range. Due to the low gravel cover on this site, 35% or less bare ground was deemed appropriate based on the slope, aspect, and erodibility of these soils.

Key Area 2, Loamy Upland 7-10"pz ecological site:

- Maintain a perennial grass composition of  $\geq 10\%$
- Maintain a foliar cover of  $\geq 10\%$

- Maintain a bare ground cover class of  $\leq 50\%$

Rationale:

This Key Area is located on a terrace at an elevation of approximately 2220'.

Rationale is taken from the NRCS Loamy Upland ecological site guide and reference sheet. Both the ecological site guide and reference sheet state that perennial grasses make up a minor component of this ecological site. This site is at a lower elevation than Eagle Eye Key Area 1, and includes small inclusions of more clayey soils facilitating grass production. Due to the limited nature of these inclusions, a perennial grass composition of equal to or greater than 10% is expected to maintain the perennial grasses on the site and allow for additional recruitment. Due to the presence of perennial grasses on the site, and the proximity of the Clayey Upland ecological site, a palatable shrub composition was not set for this Key Area. The reference sheet shows a canopy cover class between 15-25%. Due to this site being on the lower end of the ESD rainfall range, a foliar cover class of 10% is appropriate to the site. The reference sheet calls for a bare ground cover class between 10-60%, dependent upon annual rainfall. A bare ground cover class of less than or equal to 50% is appropriate to the site given its rainfall regime and the reference state.

#### *Christopherson Allotment*

Key Area 2, Clayey Swale 7-10"pz ecological site:

- Maintain a perennial grass composition of  $\geq 70\%$
- Maintain a foliar cover of  $\geq 30\%$
- Maintain a bare ground cover class of  $\leq 45\%$

Rationale:

This Key Area is located on a terrace at an elevation of approximately 2210'.

Rationale for DPC objectives is taken from the NRCS Clayey Swale ecological site guide and reference sheet. The ecological site guide shows a perennial grass composition of 60-68% at historic climax plant community, and the reference sheet shows 85-90% of the canopy cover is perennial grasses in the reference state. The perennial grass objective of 70% composition slightly exceeds the historic climax plant community but is based on the low shrub and tree cover present on the site. The reference sheet calls for a canopy cover between 20-30%. The foliar cover objective falls within this range. In the reference state, the bare ground ranges from 20-60%. The bare ground cover class objective falls within this range. Due to the absence of gravel cover on this site, 45% or less bare ground was deemed appropriate based on the slope, aspect, and erodibility of these soils. This site is located at a slightly higher elevation than 6Y Key Area 1, and is expected to have a lower available water, leading to an increased bare ground potential in comparison.

Key Area 3, Limy Fan 7-10"pz ecological site:

- Maintain a palatable shrub composition of  $\geq 15\%$
- Maintain a foliar cover of  $\geq 15\%$
- Maintain a bare ground cover class of  $\leq 35\%$

Rationale:

This Key Area is located on a fan at an elevation of approximately 2310'.

Rationale of DPC objectives is taken from the NRCS Limy Fan ecological site guide and reference sheet. The ecological site guide and reference sheet show a limited potential for perennial grasses on the site, with the reference sheet showing none occurring in the reference state. A perennial grass DPC objective was not set due to this. The ecological site guide shows a shrub component from 44-88%. When considering the species within this shrub component that serve as forage species for wildlife, a palatable

shrub composition of equal to or greater than 15% is appropriate to the site. In the reference state, canopy cover is expected to be between 10-15%. The foliar cover DPC objective falls within the range of the reference state. Bare ground on the site is expected to be between 10-60% depending on gravel and litter cover. The bare ground cover class DPC falls within this range and is appropriate to the site.

## 5.0 Inventory and Monitoring Data

### 5.1 Rangeland Survey Data

Rangeland Inventory was completed on the Eagle Eye Complex in 1981. This inventory was completed using the Modified Soil Vegetation Inventory Methodology based on BLM Handbook H-4410-1, “National Range Handbook” and Technical Reference 1734-7, “Ecological Site Inventory”. The inventory was used to determine range condition and apparent trend as described in the 1982 Lower Gila North Draft Grazing Environmental Impact Statement.

### 5.2 Monitoring Protocols

Monitoring protocols used at the Key Areas on the allotments include a variety of study methods. Compliance with Standard One is completed using the Interpreting Indicators of Rangeland Health study method, as described in BLM Technical Reference 1734-6 Version 4 (2005). This study method is supplemented with quantitative data collected in the methods described below.

Compliance with Standard Three is completed using a variety of upland study methods. On 6Y Key Area 1 and Christopherson Key Areas 2 and 3, Dry Weight Rank, Point Cover, and Pace Frequency are used for vegetative monitoring. These methods are described in detail in BLM Technical Reference 1734-4, “Sampling Vegetation Attributes”. For these methods, a 40X40 centimeter quadrat was used, with a single point located along the rear edge of the frame for point cover data. On Eagle Eye Key Area 1 and 6Y Key Area 2, Belt Density, Line Intercept, and Point Cover are used due to the low vegetative cover of these sites.

Utilization data was collected at each Key Area using the Key Species method. This method is described in BLM Technical Reference 1734-3, “Utilization Studies and Residual Measurements”.

## 6.0 Management Evaluation and Summary of Studies Data

### 6.1 Actual Use

Actual Use reporting is not required on any of the allotments in the Eagle Eye Complex. The BLM administered portions of the Eagle Eye allotment are used intermittently, as the allotment is classified as Ephemeral. Actual use reporting is not required on these allotments. Livestock numbers provided in the tables below are based on actual use reports as available, and billed use.

#### 6.1.1 Eagle Eye Allotment

<u>Number of Active Livestock</u>	<u>Kind</u>	<u>Grazing Begin</u>	<u>Period End</u>	<u>%PL</u>	<u>AUM" s</u>
454	Cattle	3/9/2010	5/9/2010	67	605
186	Cattle	2/13/2008	5/27/2008	67	704

1112	Cattle	4/1/2001	4/30/2001	67	735
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### 6.1.2 6Y Ranch Lease Allotment

<u>Number of Active Livestock</u>	<u>Kind</u>	<u>Grazing Begin</u>	<u>Period End</u>	<u>%PL</u>	<u>AUM" s</u>
25	Cattle	3/1/14	2/28/15	71	213
25	Cattle	3/1/13	2/28/14	71	213
25	Cattle	3/1/12	2/28/13	71	213
25	Cattle	3/1/11	2/28/12	71	213
25	Cattle	3/1/10	2/28/11	71	213
25	Cattle	3/1/09	2/28/10	71	213
25	Cattle	3/1/08	2/28/09	71	213
25	Cattle	3/1/07	2/28/08	71	213
25	Cattle	3/1/06	2/28/07	71	213
25	Cattle	3/1/05	2/28/06	71	213
25	Cattle	3/1/04	2/28/05	71	213

### 6.1.3 Christopherson Allotment

<u>Number of Active Livestock</u>	<u>Kind</u>	<u>Grazing Begin</u>	<u>Period End</u>	<u>%PL</u>	<u>AUM" s</u>
156	Cattle	3/1/14	2/28/15	73	
156	Cattle	3/1/13	2/28/14	73	
156	Cattle	3/1/12	2/28/13	73	
0	Cattle	3/1/11	2/28/12	73	
156	Cattle	3/1/10	2/28/11	73	1367
156	Cattle	3/1/09	2/28/10	73	1367
156	Cattle	3/1/08	2/28/09	73	1367
156	Cattle	3/1/07	2/28/08	73	1367
156	Cattle	3/1/06	2/28/07	73	1367
100	Cattle	3/15/05	5/31/05	73	187
156	Cattle	3/1/04	2/28/05	73	1367

## 7.0 Conclusions

### 7.1 Upland Health Conclusions

Summary of Standard Achievement or Non-achievement for all Key Areas:

<b>Allotment</b>	<b>Key Area</b>	<b>Standard One</b>	<b>Standard Three</b>
<b>Eagle Eye</b>	KA1	Achieved	Achieved
<b>6 Y</b>	KA1	Achieved	Achieved



	KA2	Achieved	Achieved
<b>Christopherson</b>	KA2	Achieved	Achieved
	KA3	Achieved	Achieved

Upland Health Conclusions are based on the analysis of the current monitoring data for each key area. Standard Three analysis is based on Dry Weight Rank and Point Cover study methods or on Belt Density and Line Intercept study methods. Grass composition results are based on the sum composition percent for all grass species occurring on the study area. Palatable shrub composition results are based on the sum composition percent for all palatable browse species as listed, by animal species, in Appendix A, Section 3, "Eagle Eye Complex Plant List". Vegetative foliar cover and bare ground cover class results are based on point cover data.

Utilization data is used to determine if livestock are a potential causal factor for non-achievement of Standards. Based on Holechek (1988), livestock utilization levels in this precipitation zone should be between 30-40% for moderate use without producing deleterious effects to the ecological site. Based on Heffelfinger(2006), browse utilization in this precipitation zone should be limited to 35% to prevent deleterious effects to deer habitat.

### **7.1.1 Eagle Eye allotment**

#### *Key Area 1*

Standard One: Upland Site Achieves Standard

Objective: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Signs of accelerated erosion are minimal and are consistent with the site reference state. Soil and Site Stability and Hydrologic Function ratings are both categorized as a "None to Slight Departure" from the reference state. Reference Section 2.1.1 of Appendix A.

Standard Three: Standard is achieved on this site.

- Maintain a palatable shrub composition at  $\geq 20\%$  ACHIEVED
- Maintain a foliar cover of  $\geq 15\%$  ACHIEVED
- Maintain a bare ground cover class of  $\leq 40\%$  ACHIEVED

Rationale:

The palatable shrub composition objective is met for desert tortoise on this site, at 38%. Foliar cover on the site was calculated to be slightly more than 19%, meeting the DPC objective. Bare ground on the site was calculated to be slightly more than 23%, meeting the DPC objective.

Utilization data on this key area shows use of 3-awn grass at 7.5%.

### **7.1.2 6Y Ranch Lease allotment**

#### *Key Area 1*

Standard One: Upland Site Achieves Standard

Objective: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Signs of accelerated erosion are minimal and are consistent with the site reference state. Soil and Site Stability and Hydrologic Function ratings are both categorized as a “None to Slight Departure” from the reference state. Reference Section 2.2.1 of Appendix A.

Standard Three: Standard is achieved on this site.

- Maintain a perennial grass composition of  $\geq 70\%$  ACHIEVED
- Maintain a foliar cover of  $\geq 30\%$  NOT ACHIEVED
- Maintain a bare ground cover class of  $\leq 35\%$  ACHIEVED

Rationale: The perennial grass composition is met for Sonoran desert tortoise on this site, at 79%.: The perennial grass composition objective is met on this site, with a perennial grass composition of just slightly less than 79%. Foliar cover objectives are not met on this site, with foliar cover being calculated at 28%. The bare ground cover class objective is met on this site, with a bare ground cover class of 7%. Extensive litter was present on the site, both from annual species and perennial grasses.

Utilization on the site was calculated between 2.5 and 7% in 2013 and 2015. Based on these low utilization levels, it is unlikely that livestock are a causal factor for partial non-achievement of Standard 3.

#### *Key Area 2:*

Standard One: Upland Site Achieves Standard

Objective: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Signs of accelerated erosion are minimal and are consistent with the site reference state. Soil and Site Stability and Hydrologic Function ratings are both categorized as a “None to Slight Departure” from the reference state. Reference Section 2.2.2 of Appendix A.

Standard Three: Standard is achieved on this site.

- Maintain a perennial grass composition of  $\geq 10\%$  ACHIEVED
- Maintain a foliar cover of  $\geq 10\%$  ACHIEVED
- Maintain a bare ground cover class of  $\leq 50\%$  ACHIEVED

Rationale: The perennial grass composition is met for Sonoran desert tortoise on this site, at 12.5%. Although a palatable browse objective was not set, the palatable browse component for mule deer was 10% due to the presence of mesquite on the site. The foliar cover objective is met on the site, with a foliar cover of 11%. The bare ground cover class is met on the site, with a cover class of slightly more than 48%.

Utilization on the site was calculated between 2.5 and 7% in 2013 and 2015.

#### **7.1.1 Christopherson allotment**

##### *Key Area 2*

Standard One: Upland Site Achieves Standard

Objective: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Signs of accelerated erosion are minimal and are consistent with the site reference state. Soil and Site Stability and Hydrologic Function ratings are both categorized as a “None to Slight Departure” from the reference state. Reference Section 2.3.1 of Appendix A.

Standard Three: Standard is achieved on this site.

- Maintain a perennial grass composition of  $\geq 70\%$  ACHIEVED
- Maintain a foliar cover of  $\geq 30\%$  NOT ACHIEVED
- Maintain a bare ground cover class of  $\leq 45\%$  ACHIEVED

Rationale:

The perennial grass composition objective for Sonoran desert tortoise is met on this site, with a perennial grass composition of 97%. Foliar cover objectives are not met on this site, with foliar cover being calculated at 29%. The bare ground cover class objective is met on this site, with a bare ground cover class of 30%. Extensive litter was present on the site, both from annual species and perennial grasses.

Utilization on the site was calculated between 18 and 15% in 2013 and 2015. Based on these utilization levels, it is unlikely that livestock are a causal factor for partial non-achievement of Standard 3.

### *Key Area 3*

Standard One: Upland Site Achieves Standard

Objective: Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).

Signs of accelerated erosion are minimal and are consistent with the site reference state. Soil and Site Stability and Hydrologic Function ratings are both categorized as a “None to Slight Departure” from the reference state. Reference Section 2.3.2 of Appendix A.

Standard Three: Standard is achieved on this site.

- Maintain a palatable shrub composition of  $\geq 15\%$  ACHIEVED
- Maintain a foliar cover of  $\geq 15\%$  ACHIEVED
- Maintain a bare ground cover class of  $\leq 35\%$  ACHIEVED

Rationale: The palatable shrub composition objective was met on this site for desert tortoise, with a palatable shrub composition of 91%. The palatable shrub composition is met for mule deer, with a palatable shrub composition of slightly more than 17%. The foliar cover objective is met on this site, with a foliar cover of slightly more than 24%. The bare ground cover class objective is met, with a bare ground cover class of 27%.

Utilization on the site was calculated at 6%.

## **8.0 Recommended Management Actions**

### **8.1 Recommended Management Actions for Uplands in the Complex**

To facilitate orderly management of the range, Actual Use reporting should be added to the terms and conditions of the perennial leases. The lessees have voluntarily submitted Actual Use for several years, however, adding the reporting requirement will ensure appropriate use levels have been maintained during drought years, and will facilitate desired stocking rate calculations in years that Utilization data is collected.

Continued management of the Eagle Eye allotment as an ephemeral only permit is recommended. While year-long forage is available on portions of the allotment, the majority of the public lands within the

allotment lack sufficient forage to support a base herd. Areas with perennial forage are within Category I Sonoran desert tortoise habitat around Eagle Eye peak.

The 6Y allotment has potential to support additional livestock following monsoonal green-up of *Pleuraphis* species. Given current livestock stocking rates and utilization levels, the current perennial stocking rate should be maintained, with a seasonal stocking increase during the warm-season grass growing season. *Tobosa* species on the allotment would likely benefit from short-term increased grazing to reduce standing dead prior season growth.

## 9.0 List of Preparers

Name	Title
James Holden	Rangeland Management Specialist
Codey Carter	Wildlife Biologist
Steve Bird	Wild Horse and Burro Specialist
Mary Skordinsky	Recreation Specialist
Tom Bickauskas	Travel Management Specialist

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Technical Reference 1734-7. 2001. Ecological Site Inventory. Natural Science and Technology Center, Bureau of Land Management. Denver, Colorado.

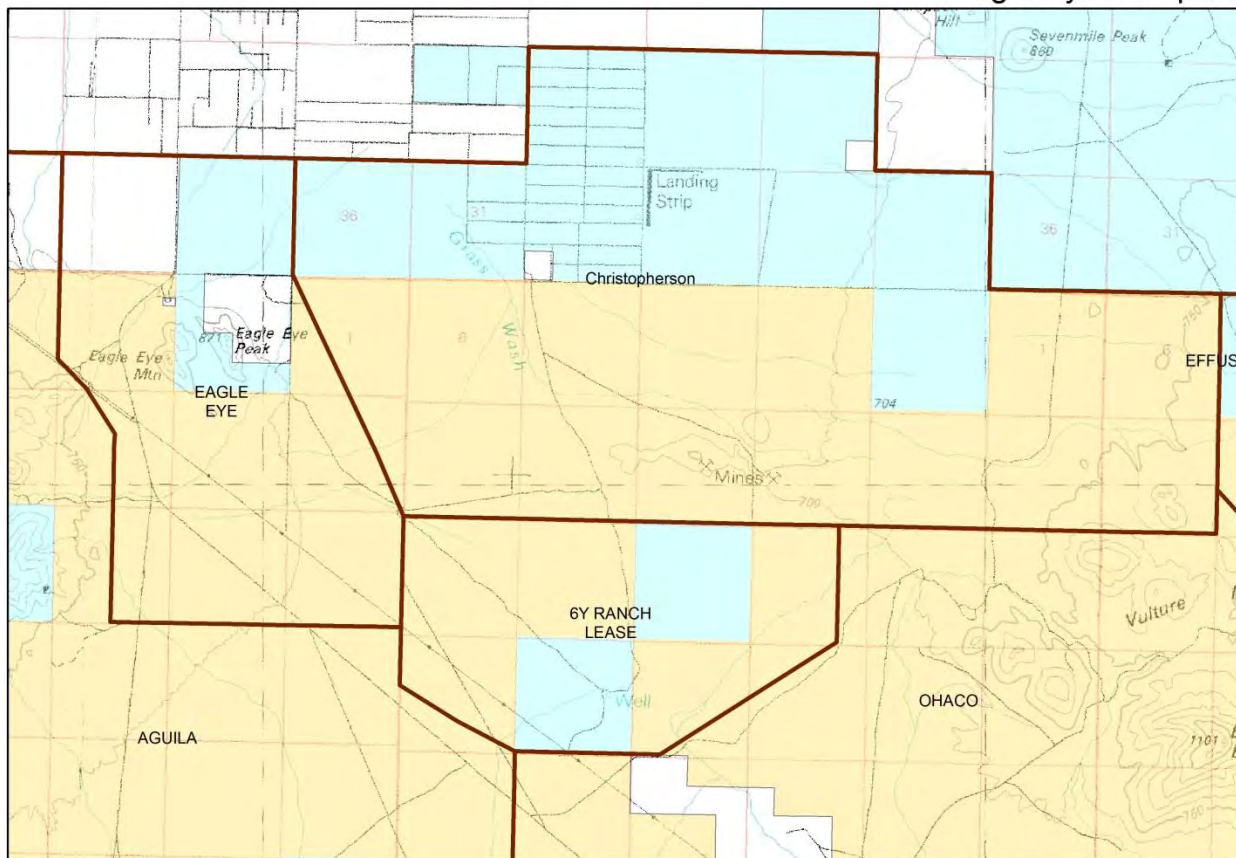
Van Devender, T. R., et al. 2002. Grasses, Mallows, Desert Vine, and More: Diet of the Desert Tortoise in Arizona and Sonora. Pp.159-193 in T. R. Van Devender. ed. The Sonoran Desert Tortoise: Natural History, Biology, and Conservation. University of Arizona Press and The Arizona-Sonora Desert Museum, Tucson.

## **Eagle Eye Complex Data Appendices**

# 1.0 Complex Maps

Map 1, Eagle Eye Complex Boundaries

## Eagle Eye Complex



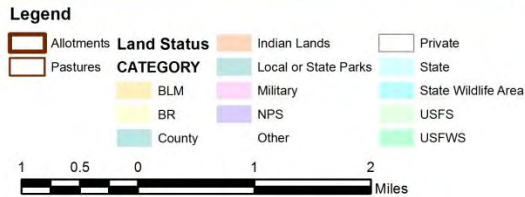
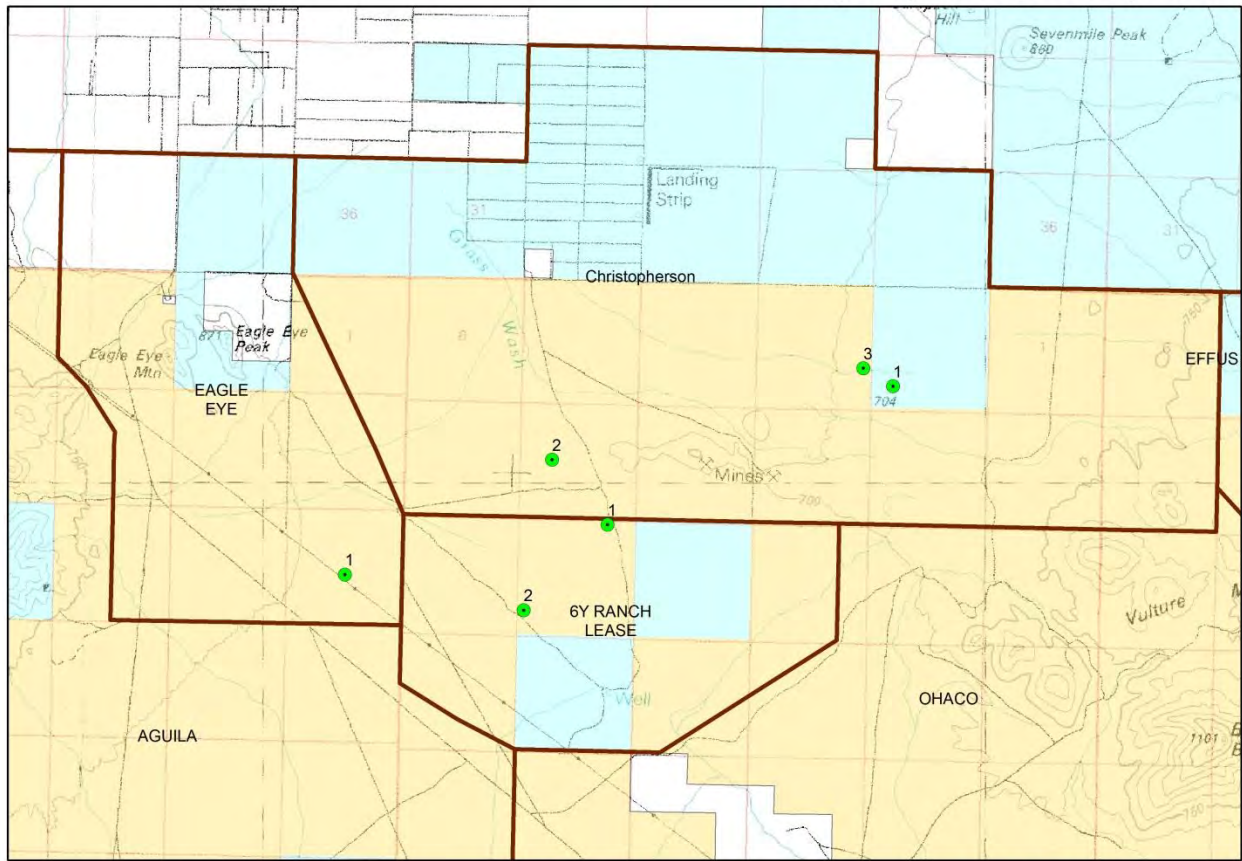
**Legend**

Allotments	<b>Land Status</b>	Indian Lands	Private
Pastures	<b>CATEGORY</b>	Local or State Parks	State
	BLM	Military	State Wildlife Area
	BR	NPS	USFS
	County	Other	USFWS



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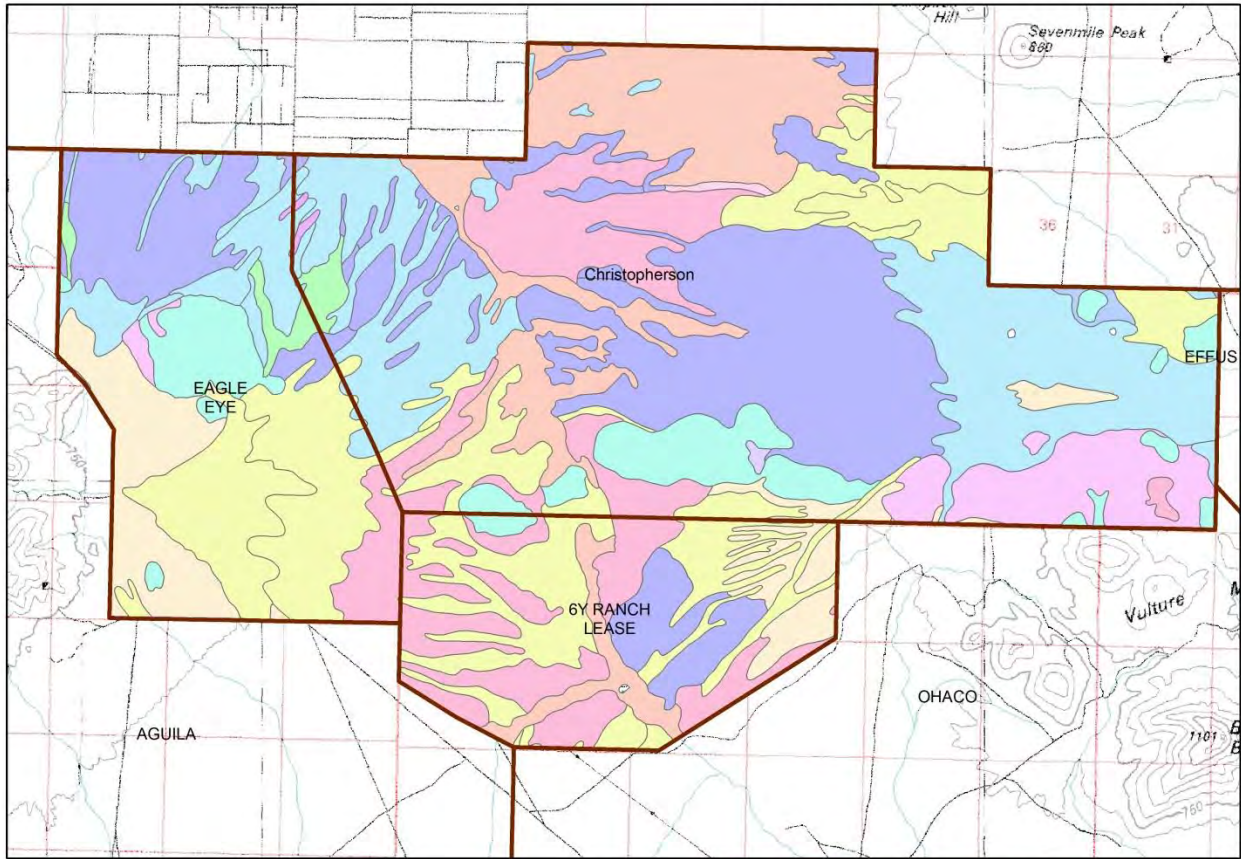
### Eagle Eye Complex Key Areas



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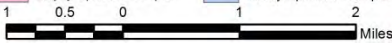


Map 3, Eagle Eye Complex Ecological Sites  
 Eagle Eye Complex Ecological Sites



**Legend**

Ecological Site	
	Clay Loam Upland 7-10" p.z.
	Clayey Bottom 7-10" p.z.
	Clayey Upland 10-12" p.z.
	Clayey Upland 7-10" p.z.
	Granitic Hills 7-10" p.z.
	Limy Fan 7-10" p.z.
	Limy Upland 10-12" p.z.
	Loamy Upland 10-12" p.z.
	Loamy Upland 7-10" p.z.
	Sandy Loam 7-10" p.z. Deep
	Sandy Loam Upland 10-12" p.z.
	Sandy Loam Upland 7-10" p.z. Fine
	Volcanic Hills 7-10" p.z.



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## 2.0 Key Area Data

### 2.1 Eagle Eye Allotment

#### 2.1.1 Key Area 1

##### Interpreting Indicators of Rangeland Health:

Attribute Rating:	Rationale:
Soil and Site Stability (S):	None to Slight Departure. The indicators observed, when compared to the reference state, are consistent with expected conditions on the site.
Hydrologic Function (H):	None to Slight Departure. The indicators observed, when compared to the reference state, are consistent with the expected conditions on the site.
Biotic Integrity (B):	None to Slight Departure. The indicators observed, when compared to the reference state, are consistent with the expected conditions on the site.

Codes: N-S (None to Slight) S-M (Slight to Moderate) M (Moderate) M-E (Moderate to Extreme) E-T (Extreme to Total)

##### Point Cover Data:

Point Cover data were collected in conjunction with Line Intercept and Density data. The percent cover by cover class is given below:

Year	Site	Bare Ground	Herb. Cover	Litter	Rock/Gravel	Cryptogam
2015	1	23.1%	19.6%	40.7%	10.6%	6.0%

##### Frequency and Composition Data:

Composition data is based on Belt Density Transects.

Plant Species KA1 2014	Symbol	2015
		Compositon (%)
<b>Tree and Shrub Species</b>		
Ambrosia deltoidea	AMDE4	36.5%
Larrea tridentata	LATR2	60.9%
Ambrosia dumosa	AMDU2	1%
Peniocereus greggii	PEGR3	0.5%
Prosopis velutina	PRVE	0.5%
<b>Grasses</b>		
Dasyochloa pulchella	DAPU7	0.5%

##### Utilization data:

KA1 Utilization, 2015		% Use
SPECIES	SYMBOL	1/2015
3-awn	ARIST	7.5%

## 2.2 6Y Ranch Lease Allotment

### 2.2.1 Key Area 1

#### Interpreting Indicators of Rangeland Health:

Attribute Rating:	Rationale:
Soil and Site Stability (S):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.
Hydrologic Function (H):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.
Biotic Integrity (B):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.

Codes: N-S (None to Slight) S-M (Slight to Moderate) M (Moderate) M-E (Moderate to Extreme) E-T (Extreme to Total)

#### Ground Cover Data:

Year	Bare Ground	Gravel (>2mm-3")	Herb. Canopy	Litter	Rock >3"	Live Basal Veg.
2013	7.0%	0%	28.0%	51.0%	0%	14.00%

#### Frequency and Composition Data:

Plant Species KA1 2013	Symbol	Frequency (%)	Composition (%)
<b>Tree and Shrub Species</b>			
Prosopis velutina	PRVE	2.0	1.0
<i>Total</i>			<i>1</i>
<b>Grasses</b>			
Pleuraphis mutica	PLMU3	79.0	78.9
Eragrostis cilianensis	ERCI	45.5	13.6
Leptochloa viscida	LEVI5	22.0	6.5
<i>Total</i>			<i>99</i>

#### Utilization Data:

KA1 Utilization		% USE		
SPECIES	SYMBOL	1/2013	10/2013	1/2015
Tobosagrass	PLMU3	2.5%	7%	2.5%

### 2.2.2 Key Area 2

#### Interpreting Indicators of Rangeland Health:

Attribute Rating:	Rationale:
Soil and Site Stability (S):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.
Hydrologic Function (H):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.

Biotic Integrity (B):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.
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Codes: N-S (None to Slight) S-M (Slight to Moderate)M (Moderate)M-E (Moderate to Extreme) E-T (Extreme to Total)

Ground Cover Data:

Year	Bare Ground	Gravel/Stone	Herb. Canopy	Litter	Cryptogam
2013	48.5%	30.5%	11.0%	8.0%	2.0%

Composition Data:

Composition data is taken from belt density transects.

Plant Species KA2 2013	Symbol	Composition (%)
<b>Tree and Shrub Species</b>		
Larrea tridentata	LATR2	77.5%
Prosopis velutina	PRVE	10.0%
<i>Total</i>		<i>87.5%</i>
<b>Grasses-Perennial</b>		
Pleuraphis mutica	PLMU3	12.5%
<i>Total</i>		<i>12.5%</i>

Utilization Data:

KA2 Utilization, 2014		% USE	
SPECIES	SYMBOL	1/2013	1/2015
Tobosagrass	PLMU3	4.6%	16%

## 2.3 Christopherson Allotment

### 2.3.1 Key Area 2

#### *Interpreting Indicators of Rangeland Health:*

Attribute Rating:	Rationale:
Soil and Site Stability (S):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.
Hydrologic Function (H):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.
Biotic Integrity (B):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.

Codes: N-S (None to Slight) S-M (Slight to Moderate) M (Moderate) M-E (Moderate to Extreme) E-T (Extreme to Total)

#### *Ground Cover Data:*

Ground Cover data were collected as point cover data in conjunction with Dry Weight Rank and Frequency data. The percent cover by cover class is given below:

Year	Site	Bare Ground	Herb. Cover	Litter	Live Basal Veg
2013	2	30.0%	29.0%	27.0%	14.0%

#### *Frequency and Composition Data:*

Composition data is relative composition based on the Dry Weight Rank study method.

KA2 2013 Plant Species	Symbol	Frequency (%)	Composition (%)
<b>Tree and Shrub Species</b>			
Prosopis velutina	PRVE	1.0	1.2
Opuntia sp.	OPUNT	2.0	1.8
<b>Grasses-Perennial</b>			
Pleuraphis mutica	PLMU3	85.0	97.0

#### *Utilization Data:*

Key Area 2 Utilization		% USE	
SPECIES	SYMBOL	3/2013	1/2015
Pleuraphis mutica	PLMU3	17.9%	15.2%

### 2.3.2 Key Area 3

#### *Interpreting Indicators of Rangeland Health:*

Attribute Rating:	Rationale:
Soil and Site Stability (S):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.
Hydrologic Function (H):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.

Biotic Integrity (B):	None to Slight Departure. The observed indicators, when compared to the reference state, are consistent with the expected conditions on the site.
-----------------------	---

Codes:N-S (None to Slight)S-M (Slight to Moderate)M (Moderate)M-E (Moderate to Extreme) E-T (Extreme to Total)

Ground Cover Data:

Ground Cover data were collected as point cover data in conjunction with Dry Weight Rank and Frequency data. The percent cover by cover class is given below:

Year	Site	Bare Ground	Herb. Cover	Litter	Gravel	Rock >= 1/2"	Cryptogam
2013	3	27.0%	24.5%	8.5%	31.0%	5.5%	3.5%

Frequency and Composition Data:

Composition data is relative composition based on the Dry Weight Rank study method.

Plant Species KA3 2013	Symbol	Frequency (%)	Composition (%)
<b>Tree and Shrub Species</b>			
Ambrosia dumosa	AMDU2	4.5	10.2
Larrea tridentata	LATR2	33.0	80.5
Lycium andersonii	LYAN	0.5	1.1
Prosopis velutina	PRVE	3.0	6.1
<i>Total</i>		<i>41</i>	<i>97.9</i>
<b>Forbs- Perennial/Biennial</b>			
Amsinckia	AMSIN	1.0	
Erodium	ERODI	0.5	
Perezia	PEREZ2	0.5	
Phoradendron	PHORA	1.0	0.5
Plantago	PLANT	0.5	
Unknown Forb		1.5	1.5
<i>Total</i>		<i>5</i>	<i>2</i>

Utilization data:

Key Area 3 Utilization		% USE
SPECIES	SYMBOL	1/2015
Ambrosia dumosa	AMDU2	6%

### 3.0 Eagle Eye Complex Plant List

The following plant list comprises all the plant species identified on long-term monitoring transects. This list is not exhaustive nor all inclusive of the plants on the Complex. Plant species on the list are identified by common name, scientific name, and NRCS Plants Database symbol. Palatable plants are identified, by species, for Sonoran desert tortoise, mule deer, and domestic livestock (cattle). Palatability of plant species for Sonoran desert tortoise is taken from VanDevender, et al (2002) and Oftedal (2002). Palatability of plant species for mule deer is taken from the “Habitat Guidelines for Mule Deer: Southwest Deserts Ecoregion” (Heffelfinger 2006). Livestock plant palatability is taken from the Complex-associated Ecological Site Descriptions.

Common Name	Scientific Name	Symbo l	Sonoran Tortoise	Mule Deer	Livestoc k
Triangle bursage	<i>Ambrosia deltoidea</i>	AMDE 4	X		
White bursage	<i>Ambrosia dumosa</i>	AMDU 2	X	X	
Fiddleneck	<i>Amsinckia spp.</i>	AMSIN			
Fluffgrass	<i>Dasyochloa pulchella</i>	DAPU7			
Stinkgrass	<i>Eragrostis cilianensis</i>	ERCI			
Stork’s bill	<i>Erodium spp.</i>	ERODI		X	
Creosote bush	<i>Larrea tridentata</i>	LATR2	X		
Sticky sprangletop	<i>Leptochloa viscida</i>	LEVI5			
Wolfberry	<i>Lycium andersonii</i>	LYAN	X		
Pricklypear	<i>Opuntia</i>	OPUNT	X	X	
Night blooming cereus	<i>Peniocereus greggii</i>	PEGR3			
perezia	<i>Perezia</i>	PEREZ 2			
mistletoe	<i>Phoradendron californicum</i>	PHCA8		X	
Indian wheat	<i>Plantago spp.</i>	PLANT			
Tobosagrass	<i>Pleuraphis mutica</i>	PLMU3	X		
Mesquite	<i>Prosopis velutina</i>	PRVE	X	X	X

