United States Department of the Interior

Bureau of Land Management

Arnold (No. 03004) and Beloat (No. 03007) Grazing Allotments Reauthorization

Environmental Assessment

DOI-BLM-AZ-P020-2025-0006-EA

August 2025

U.S. Department of the Interior
Bureau of Land Management
Phoenix District

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1 INTRODUCTION

1.1 BACKGROUND

The Bureau of Land Management (BLM) is considering whether to renew 10-year term grazing authorizations (grazing permits) for the Arnold and Beloat Allotments (Allotments) and, if so, on what terms and conditions. The Allotments overlap with the Sonoran Desert National Monument (SDNM). In 2024, the BLM completed the SDNM Complex Land Health Evaluation (LHE), which evaluated achievement of the Arizona Standards for Rangeland Health (Standards) for the Arnold and Beloat Allotments, both inside and outside of the SDNM, and, in cases of non-achievement, determined the causal factor or factors thereof.

The Allotments are located approximately 25 miles southwest of the City of Phoenix in Maricopa County, Arizona (Figure 1). The Allotments are adjacent to each other and bound by the Gila River to the north, the Estrella Mountains to the east, the North Maricopa Mountains to the south, and highway 85 to the west. The community of Estrella, a suburb of the City of Goodyear, and numerous agricultural lands are within the northeastern portion of the Beloat Allotment. The El Paso natural gas pipeline acts as the SDNM boundary and bisects the southwestern portion of the Beloat Allotment and the southern portion of the Arnold allotment. The SDNM encompasses 1,612 acres of the Arnold and 33,758 acres of the Beloat (Table 1). The Allotments include BLM administered and other federal, Arizona State Trust (referred to as state land) and state wildlife area, Native American Reservation, and private lands (Table 2).

Table 1 Land use in Bureau of Land Management jurisdiction including the Sonoran Desert National Monument (SDNM) and single use utililty scale solar right-of-way (ROW).

BLM Land Use	Arnold	Beloat	Planning Area
BLM inside the SDNM	1,612	33,758	35,370
BLM outside the SDNM	21,867	63,596	85,463
Subtotal BLM	23,479	97,354	120,833
Solar ROW	1,025	2,063	3,088
BLM Available	22,454	95,291	117,745

Table 2 Land management within the planning area broken down by allotment.

Land Management	Arnold	Beloat	Planning Area
BLM (Available)	22,454	95,291	117,745
Other Federal	333	1,077	1,410
Indian Reservation	0	3,180	3,180
State Trust Land	1,108	22,705	23,813
State Wildlife Area	5	54	59
Private Land	1,291	52,392	53,683
Total Acres	25,191	174,699	198,388

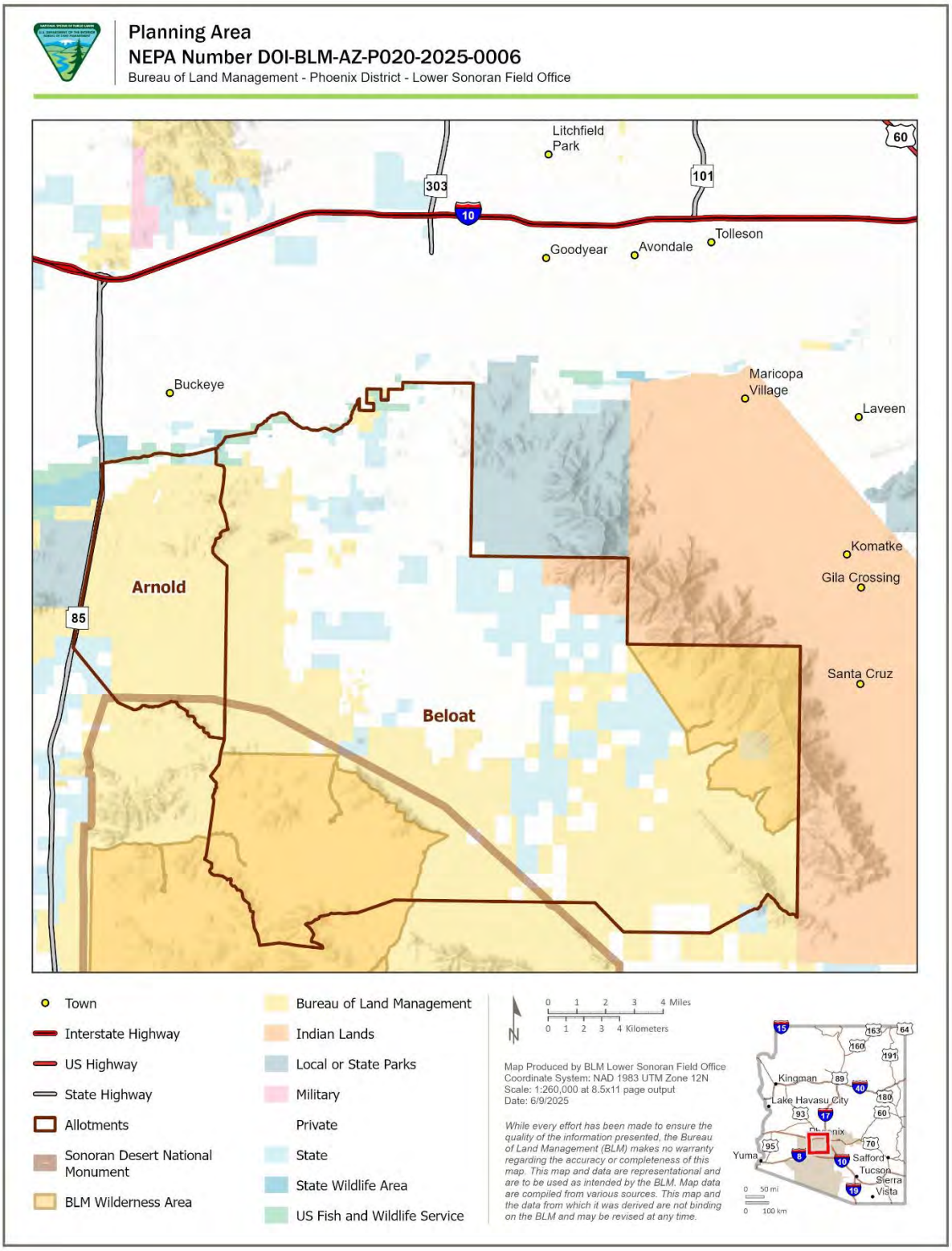

Figure 1 Map of the general area surrounding the analysis area. A full-sized map 508 compliant map is available in the document section of the EA website (https://eplanning.blm.gov/eplanning-ui/project/2036119/510).

1.2 GRAZING HISTORY

Livestock grazing in Gila Bend and the surrounding areas began in the late 1700s with a few Native American rancherias where livestock were confined to the flood plains of the Gila River. At the time, the river was the only available reliable water source that could support livestock. Livestock use of the drier valleys and mountains did not occur until the drilling of wells and development of dirt stock tanks in the early 1900s. The first of these was a dirt stock tank developed around 1900 in the Little Rainbow Valley just north of the SDNM boundary. The first wells in the area were drilled in Rainbow Valley around 1910 to 1912. Portions of the Beloat and Arnold Allotments were incorporated into the Sonoran Desert National Monument by Presidential Proclamation 7397 on January 17, 2001 (Appendix 2).

Rangelands managed by the Lower Sonoran Field Office were classified as either perennial-ephemeral or ephemeral only between 1973 and 1976 pursuant to the special rule published in the Federal Register on December 7, 1968 (33 FR 18245).

- Ephemeral rangelands, as defined in the grazing regulations, are “areas of the Hot Desert Biome (Region) that do not consistently produce enough forage to sustain a livestock operation but may briefly produce unusual volumes of forage to accommodate livestock grazing.” “Ephemeral plant” means a short-lived annual plant that completes its life cycle in a few weeks. Examples include Indian wheat (*Plantago purshii*), filaree (*Erodium cicutarium*), Russian thistle (*Salsola kali tenifolia*), red brome (*Bromus rubens*), and six weeks grama (*Bouteloua barbata*).
- Perennial-ephemeral rangelands are areas of the Hot Desert Biome that produce enough perennial forage each year to support a year-round livestock operation and from time to time produce ephemeral vegetation suitable to accommodate additional livestock grazing.

Permits included terms and conditions for Ephemeral use only or a combination of Perennial/Ephemeral use, as appropriate (see section 2.1).

Ephemeral use authorization allows the permittee to apply to make use of ephemeral forage when it becomes available. After receiving an application for ephemeral use, the BLM must determine if ephemeral plant growth is sufficient to support the requested use. Upon approval of the application, the BLM will issue a grazing fee bill that specifies the allowed livestock numbers, period-of-use, the allotment and pasture as applicable, and the forage amount, in AUMs. Livestock were last approved for ephemeral use under an ephemeral grazing authorization on the Arnold in 2014 and 2015 for a total of 852 AUMs.

Perennial/Ephemeral use authorizations specify number of livestock, type of livestock, period of use and permitted AUMs or perennial forage that may be consumed annually throughout the term of the authorization. Additional use of ephemeral forage may be approved after the BLM has considered rangeland conditions and determined that such use will not cause detrimental effects to the perennial forage resource and does not present conflicts with other resource uses and values. Upon application approval, the BLM will issue a grazing fee bill that specifies the allowed livestock numbers, period-of-use, the allotment and pasture as applicable, and the ephemeral forage amount, in AUMs.

1.2.1 Arnold Allotment

The Arnold Allotment is classified as ephemeral use only. In years with sufficient precipitation, the grazing permittee may apply for use based on the available ephemeral forage. The Arnold is split into three pastures, one in the east, one in the west, and a smaller steer holding pasture in the center (Figure 2). There are three dirt reservoirs, and three well/pipeline served troughs. However, only one well, Chiggar well, is currently in working order. When ephemeral grazing is approved, cattle are distributed between the pastures and water sources to utilize ephemeral forage. Approximately 45 percent of the SDNM within the Arnold is fenced out from cattle use.

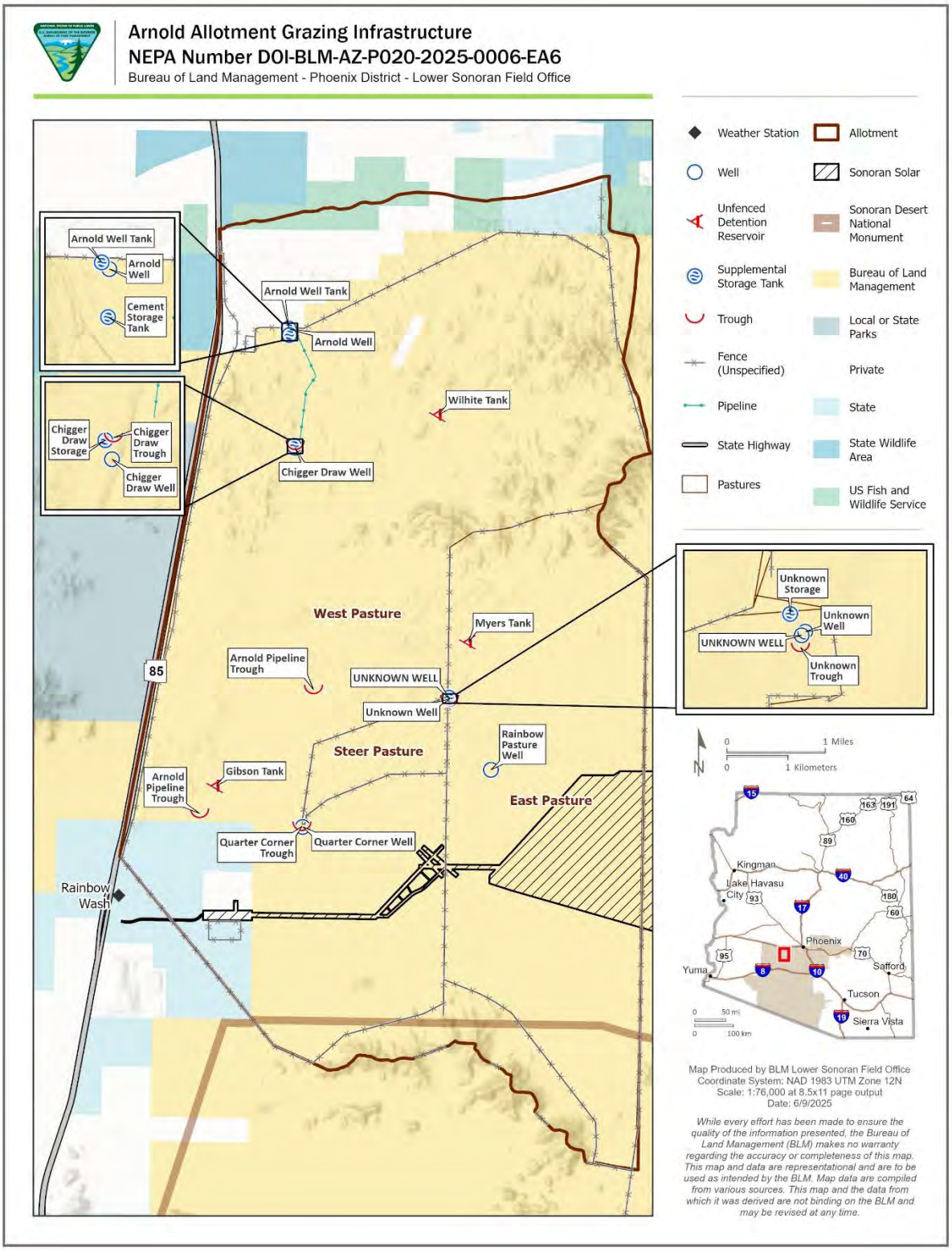

Figure 2 Grazing infrastructure and pastures of the Arnold Allotment. A full-sized map 508 compliant map is available in the document section of the EA website (https://eplanning.blm.gov/eplanning-ui/project/2036119/510).

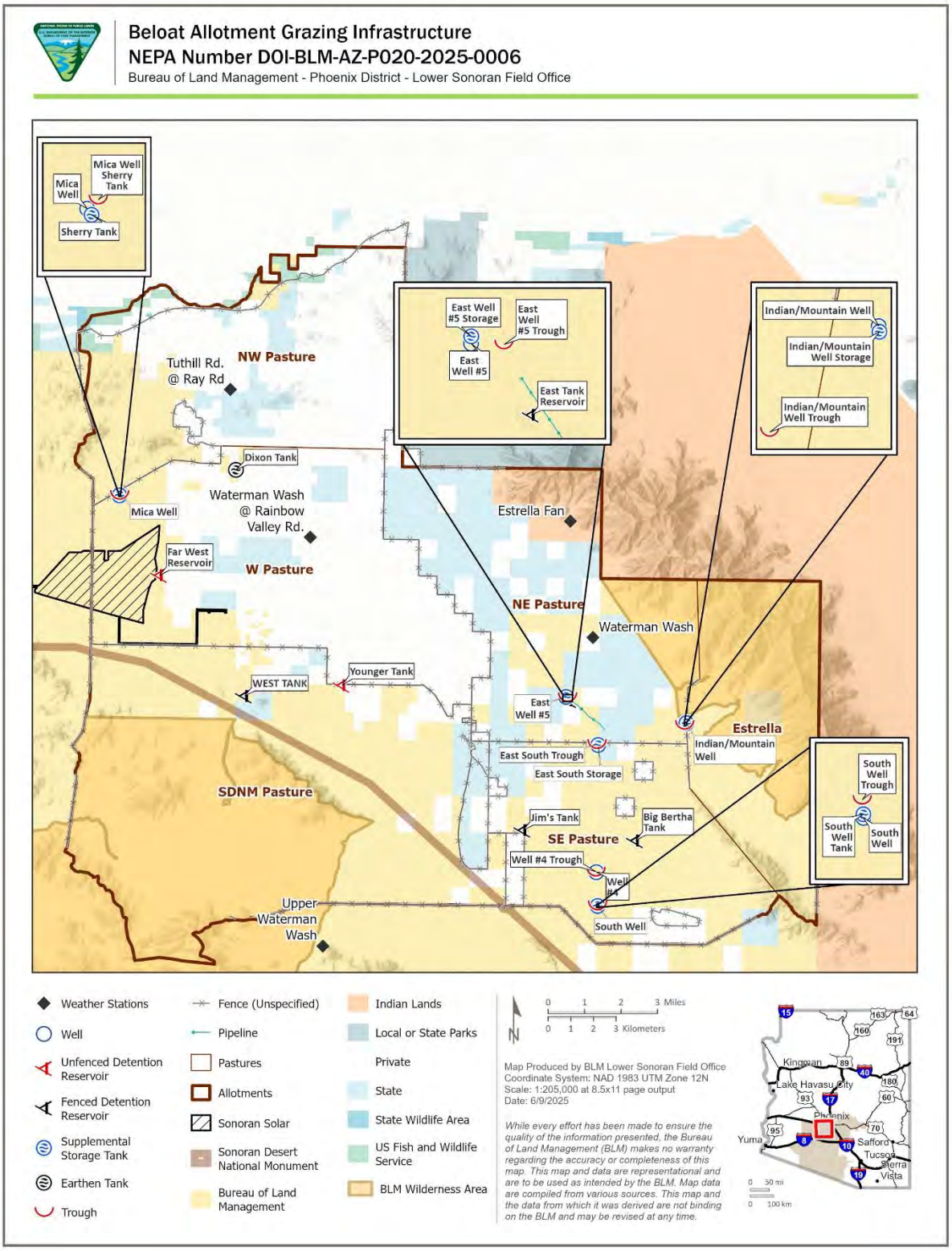

Figure 3 Grazing infrastructure and pastures of the Beloat Allotment. A full-sized map 508 compliant map is available in the document section of the EA website (https://eplanning.blm.gov/eplanning-ui/project/2036119/510).

1.2.2 Beloat Allotment

The Beloat Allotment is classified as perennial/ephemeral. A maximum base herd of 287 cows graze the Beloat year-round. Additional cattle may be approved to utilize ephemeral forage during years with sufficient precipitation. The Beloat is split into six pastures, three in the east and three in the west (Figure 3). However, the smallest pasture in the northwest has no available water at this time. There are seven well/pipeline served troughs and eleven dirt reservoirs. Fifty percent of the dirt reservoirs only hold water during years with above average precipitation. The most productive pastures with relatively even water distribution are the three eastern pastures along the Estrella Mountains. The two western pastures with available water are equal in size, but less productive. Therefore, the western pastures are used primarily as ephemeral pastures. Cattle are most frequently gathered and sorted at the Headquarters well and reservoir in the center of the Beloat off Bullard Avenue. Only the southwest pasture contains portions within the SDNM. The wildlife and urban/rural interface introduce challenges such as land sales, utility rights-of-way, and gates frequently left open.

1.3 PURPOSE AND NEED FOR ACTION

The purpose of this action is to renew, as appropriate, livestock grazing permits for the Allotments for the next 10 years, including by making appropriate adjustments to grazing management to maintain appropriate land heath conditions.

The need for this action and the maintenance of land health reflects the BLM's role in implementing the Taylor Grazing Act, the Federal Land Policy and Management Act (FLPMA), the BLM's grazing regulations (43 Code of Federal Regulations [CFR] 4100), the Lower Sonoran Resource Management Plan (RMP) (BLM 2012), and the SDNM RMP as amended (BLM 2012 and BLM 2024).

1.4 DECISION TO BE MADE

The Lower Sonoran Field Manager is the Authorized Officer responsible for decisions regarding management of public lands within the Allotments. This analysis will help to inform the decision to renew, renew with modifications, or not renew the permits. If renewed, management actions, mitigation measures, and monitoring requirements will be prescribed for the Allotments to ensure management objectives and Rangeland Health Standards continue to be achieved.

1.5 CONFORMANCE WITH APPLICABLE LAND USE PLANS

The Proposed Action is in conformance with the Lower Sonoran RMP and the SDNM RMP, as amended (BLM 2012 and BLM 2024).

The Lower Sonoran RMP makes livestock grazing available and allocates forage for the portions of the Arnold and Beloat Allotments that are located outside of the SDNM boundary (GR-1.1.1). The SDNM RMP makes livestock grazing available for ephemeral grazing only on the SDNM portion of the Allotments (GR-A-1 and GR-A-2).

The following two sections describe the RMP decisions that apply to managing grazing on BLM-administered lands in the Allotments. Each decision is preceded by its unique decision number.

1.5.1 Lower Sonoran RMP

The Lower Sonoran RMP (BLM 2012) is the applicable land use plan for the portions of the Allotments outside of the SDNM. The RMP identifies resource management objectives and management actions for managing a broad spectrum of land uses and allocations for public lands managed by the Lower Sonoran Field Office.

The following rangeland management objectives in the Lower Sonoran RMP are relevant to the Proposed Action:

Rangeland Management (GR) Objectives

- GR-1: "Manage livestock grazing in the Lower Sonoran Decision Area to provide for multiple uses while maintaining healthy ecosystems".

- GR-1.1 “Livestock grazing use and associated practices will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved. Management will achieve, or make significant progress toward achieving, Land Health Standards and produce a wide range of public values, such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.”
- GR-1.1.1 “Approximately 830,200 acres of BLM-administered lands are allocated and available for livestock grazing, as shown in Table 2-6 and Map II, Livestock grazing. Approximately 100,000 acres of BLM-administered lands will not be available for grazing.”
- GR-1.1.7 “All existing water developments will be evaluated and modified, as necessary, to provide the maximum benefit and minimum impact to priority wildlife and special status species.”
- GR-1.1.8 “Grazing management on allotments categorized as “Maintain” and “Improve” may include rest rotation, deferred rotation, deferred, seasonal, short duration or other management practices to be implemented where needs are identified through monitoring. On “Custodial” allotments, grazing systems or season of use will be coordinated with the permittee, Arizona State Land Department, and/or Natural Resources Conservation Service.”
- GR-1.1.10 “Allotments may be classified as ephemeral, in accordance with the Special Ephemeral Rule published December 7, 1968, through Rangeland Health Assessments during the permit renewal process. The BLM has established criteria and standard operating procedures (SOPs; Best, Management Practices and Standard Operating Procedures), based upon the Special Rule through which allotments can be classified and managed as ephemeral.”
- GR-1.1.11 “The Arizona Guidelines for Grazing Administration, as approved in the Arizona Standards for Rangeland Health and guidelines for Grazing Administration (1997), will apply where appropriate to all livestock grazing activities.”
- GR-1.1.12 “Land not allocated for livestock use will remain unallocated for this use and its forage and other vegetation will be reserved for wildlife and nonconsumptive uses.”
- GR-1.1.13 “If an evaluation of land health standards identifies an allotment where land health standards cannot be achieved under any level or management of livestock use and where current grazing use has been identified as the causal factor, then decisions identifying those areas as available for livestock grazing will be revisited.”
- GR-1.1.14 “Should a livestock grazing permit be relinquished, the allotment and associated resources and public uses will be evaluated to determine the appropriate allocation of available forage.”
- GR-1.1.16 “Construction of new livestock waters in Category I and Category II desert tortoise habitat and in bighorn sheep habitat will be addressed on a case-by-case basis.”
- GR-1.1.17 “Range improvement permits, and cooperative range improvement agreements shall specify the standards, design, construction, and maintenance criteria for the range improvements and other additional conditions and stipulations or modification deemed necessary. The extent, location, and timing of such actions will be based on allotment-specific management objectives adopted through the evaluation process, interdisciplinary development, and analysis of proposed actions ad funding.”

1.5.2 SDNM RMP

The SDNM RMP applies to BLM-administered lands for portions of the allotments that are within the SDNM (BLM 2012). The following rangeland management objectives in the SDNM RMP are relevant to the Proposed Action:

GR-1: “Manage livestock grazing in the SDNM to provide for multiple uses while maintaining healthy ecosystems”.

- GR-1.1 “Livestock grazing use and associated practices will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved. Management will achieve, or make significant progress toward achieving, Land Health Standards and produce a

wide range of public values, such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds."

- GR-1.1.1. "All existing water developments will be evaluated, and modified as necessary, to provide the maximum benefit and minimum impact to priority wildlife and special status species."
- GR-1.1.2 "Grazing management on allotments categorized as "Maintain" and "Improve" may include rest rotation, deferred rotation, deferred, seasonal, short duration or other management practices to be implemented where needs are identified through monitoring. On "Custodial" allotments, grazing systems or season of use will be coordinated with the permittee, Arizona State Land Department, and/or Natural Resources Conservation Service."
- GR-1.1.3 "If grazing availability or classification differs for the Big Horn, Conley, Lower Vekol, Hazen, Beloat, and Arnold allotments outside SDNM versus inside the monument boundaries, fencing or other control mechanisms will be installed to allow for management of monument lands separately from the rest of the allotment before grazing could continue."
- GR-1.1.4 "Allotments may be classified as ephemeral in accordance with the Special Ephemeral Rule published December 7, 1968, through Rangeland Health Assessments during the permit renewal process. The BLM has established criteria and SOPs based upon the Special Rule through which allotments can be classified and managed as ephemeral. These criteria include:

    - Rangelands are within the hot desert biome;
    - Average annual precipitation is less than eight inches;
    - Rangelands produce less than 25 pounds per acre of desirable perennial forage;
    - The vegetative community is composed of less than five-percent desirable forage species;
    - The rangelands are generally below 3,500 feet in elevation;
    - Annual production is highly unpredictable, and forage availability is of a short duration;
    - Usable forage production depends on abundant moisture and other favorable climatic conditions;
    - Rangelands lack potential to improve existing ecological status and produce a dependable supply of forage through intensive rangeland management practices."

- GR-1.1.5 "The Arizona Guidelines for Grazing Administration, as approved in the Arizona Standards for Rangeland Health and Guidelines for Grazing Administration (1997), will apply where appropriate to all livestock grazing activities."
- GR-1.1.6 "Lands not allocated for livestock use will remain unallocated for this use and its forage and other vegetation will be reserved for wildlife and non-consumptive uses."
- GR-1.1.7 "If an evaluation of land health standards identifies an allotment where land health standards cannot be achieved under any level or management of livestock use and where current grazing use has been identified as the causal factor, the decisions identifying those areas as available for livestock grazing will be revisited."
- GR-1.1.8 "Should a livestock grazing permit be relinquished, the allotment and associated resources, and public uses will be evaluated to determine the appropriate allocation of available forage."
- GR-1.1.9 "One-time travel off a designated routes may be approved with written authorization for the authorized officer to access sick or injured livestock. See also TM-4.2.3."
- GR-1.1.10 "Construction of new livestock waters in Category I and Category II desert tortoise habitat and in bighorn sheep habitat will be addressed on a case-by-case basis."
- GR-1.1.11 "Range improvement permits, and cooperative range improvement agreements shall specify the standards, design, construction and maintenance criteria for the range improvements and other additions conditions and stipulations or modifications deemed necessary. The extent, location and timing of such actions will be based on allotment-specific management objectives adopted through the evaluation process, interdisciplinary development and analysis of proposed actions, and funding."
- GR-2 "Manage livestock grazing in the SDNM Decision Area to provide for multiple uses while maintaining healthy ecosystems and protecting the monument's biological and cultural resources."
- GR-2.1 "Public lands in SDNM north of I-8 available to livestock use will be managed to achieve or make significant progress towards achieving Land Health Standards to ensure that the health of the biological resources is maintained or improved. Livestock grazing use and associated practices

will be managed in a manner consistent with other multiple use needs and other desired resource condition objectives to ensure that the health of rangeland resources and ecosystems are maintained or improved."

- GR-2.1.2 "Domestic goats or sheep will not be permitted."

In 2024, the BLM amended the SDNM RMP (DOI-BLM-AZ-P040-2020-0001-EA), adding the following management guidelines:

- GR-A-1 "The six livestock grazing allotments north of Interstate-8 within the SDNM are available for livestock grazing (see Selected Alternative map)" (DOI-BLM-AZ-P040-2020-0001-EA).
- GR-A-2 "Only ephemeral livestock grazing may be permitted on the SDNM portion of the six livestock grazing allotments north of Interstate-8. No AUMs are allocated for Permitted Active use" (DOI-BLM-AZ-P040-2020-0001-EA)

1.6 Relationships to Statutes, Regulations or Other Plans

The Proposed Action and alternatives must comply with the following laws and agency regulations and be consistent with applicable Federal, state and local laws, regulations, and plans to the maximum extent possible.

Presidential Proclamation 7397 designated the SDNM and provides that "[l]aws, regulations, and policies followed by the Bureau of Land Management in issuing and administering grazing permits or leases on all lands under its jurisdiction shall continue to apply with regard to the lands in the monument; provided, however, that grazing permits on Federal lands within the monument south of Interstate 8 shall not be renewed at the end of their current term; and provided further, that grazing on Federal lands north of Interstate 8 shall be allowed to continue only to the extent that the Bureau of Land Management determines that grazing is compatible with the paramount purpose of protecting the objects identified in this proclamation." The Proposed Action and alternatives are consistent with Presidential Proclamation 7397.

The Taylor Grazing Act of 1934 provide for grazing as a use of the public lands, and the Federal Land Policy and Management Act (FLPMA) of 1976 establishes the BLM's "multiple-use and sustained yield mandate to serve present and future generations" (BLM 2022a). FLPMA is an "act to establish public land policy; to establish guidelines for its administration; to provide for the management, protection, development, and enhancement of the public lands; and for other purposes" (BLM 2022a). Livestock grazing on public lands is managed according to grazing regulations found in the Code of Federal Regulations (at 43 CFR Part 4100 (2005)).

The Taylor Grazing Act 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 is 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 is administered in accordance with Section 15 of the Taylor Grazing Act. All the Allotments are within a grazing district and administered under Section 3 grazing permits.

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."

BLM Arizona adopted the *Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management* (BLM 1997) (also called the Rangeland Health Standards, Land Health Standards, Standards and Guidelines, and S&Gs) for all land use plans in 1997. The Rangeland Health Standards are intended to ensure grazing does not adversely affect rangeland health. Guidelines direct the selection of grazing management practices and livestock facilities (if appropriate) to attain and maintain, or make significant progress toward, the standards with respect to each of uplands sites, riparian-wetland areas, and desired resource conditions. Methods and practices (guidelines) address watersheds, ecological

condition, water quality, and habitat for special status species. Standard 1 - Uplands Sites has two guidelines; Standard 2 - Riparian-Wetland Areas has three guidelines, and Standard 3 - Desired Resource Conditions has seven guidelines.

Executive Order 14154, *Unleashing American Energy* (Jan. 20, 2025), and a Presidential Memorandum, *Ending Illegal Discrimination and Restoring Merit-Based Opportunity* (Jan. 21, 2025), require the Department to strictly adhere to the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321 *et seq.* Further, such Order and Memorandum repeal Executive Orders 12898 (Feb. 11, 1994) and 14096 (Apr. 21, 2023). Because Executive Orders 12898 and 14096 have been repealed, complying with such Orders is a legal impossibility. The BLM verifies that it has complied with the requirements of NEPA, including the Department's regulations and procedures implementing NEPA at 43 C.F.R. Part 46 and Part 516 of the Departmental Manual, consistent with the President's January 2025 Order and Memorandum. The BLM has also voluntarily considered the Council on Environmental Quality's rescinded regulations implementing NEPA, previously found at 40 C.F.R. Parts 1500–1508, as guidance to the extent appropriate and consistent with the requirements of NEPA and Executive Order 14154.

An existing Programmatic Agreement (PA) among the BLM, Southwestern Region Three of the U.S. Forest Service, U.S. Fish and Wildlife Service, Arizona State Historic Preservation Officer, and Advisory Council on Historic Preservation regarding the Effects of Vegetation and Range Management Activities in Arizona, executed September 30, 2020 (BLM 2020b), governs the proposed action, and compliance with the existing PA satisfies the BLM's obligations under Section 106 of the National Historic Preservation Act of 1966, 54 U.S.C. § 306108.

1.7 Issues

The BLM Lower Sonoran Field Office (LSFO) interdisciplinary (ID) team identified 5 issues that will be analyzed in detail in this Environmental Assessment. Those are:

- Will the proposed grazing management pose a risk to land health?
- Will the proposed grazing management degrade cultural resources?
- Does the proposed grazing management pose a risk for wildlife, migratory birds, BLM sensitive species, and threatened and endangered species?
- How will the proposed grazing management impact wildlife movement in corridors?
- How will the proposed grazing management impact air quality and climate change?

These issues are analyzed in detail in Chapters 3 and 4 of this environmental assessment.

1.8 Issues Considered but Eliminated from Detailed Analysis

The BLM considered reviewing the socioeconomic impact of the proposed alternatives. In 2024, the BLM studied the impact of similar alternatives to the towns of Buckeye, Goodyear, Avondale and beyond (BLM 2024, sections 3.5, 20-23, 4.7 60-62, and Appendix 6). The results of that analysis are still applicable to the current effort. The BLM incorporates the analysis from those sections by reference but does not otherwise analyze this issue in detail in this environmental assessment.

The 2024 SDNM Grazing RMPA determined the degree of changes to the visual character of the SDNM caused by livestock grazing would be negligible for BLM managed lands (BLM 2024, section 3.11, pages 48-49 and 4.13, pages 73-75). Due to the negligible impact of grazing on Visual Resource Management, the BLM incorporates the analysis from those sections by reference but does not analyze that issue in detail in this environmental assessment.

The impact to designated wilderness areas was not analyzed in detail. Wilderness areas are subject to the Wilderness Act of 1964, Section 4(d)(4)(2) of which states that grazing, "where established prior to the effective date of the Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the [administering agency]." Maintenance of range improvements and wildlife water catchments within these wilderness areas must abide by the Wilderness Act of 1964, the Arizona Wilderness Act of 1990, and the 2012 SDNM RMP/ROD. Certain motorized/mechanized uses are authorized within these wilderness areas. Emergency response, some law enforcement activities, motorized retrieval of sick or injured livestock, and other accepted uses are provided for in the Arizona Desert Wilderness Act of 1990.

2 PROPOSED ACTION AND ALTERNATIVES

This section describes the alternatives to be analyzed in detail. Based on the management recommendations presented in the 2024 SDNM Complex Land Health Evaluation (LHE), the interdisciplinary (ID) team developed Alternative A (No Action), Alternative B (Resource Protection), Alternative C (Ephemeral Grazing Only), and Alternative D (No Grazing).

2.1 ALTERNATIVE A – NO ACTION

Under Alternative A, the No Action alternative, the Arnold and Beloat permits would be renewed for a period of 10 years under the same terms and conditions as the existing permits for the Arnold (Table 3) and Beloat Allotments (Table 4).

2.1.1 Arnold Allotment

Mandatory Terms and Conditions

Table 3 Arnold Allotment Alternative A proposed mandatory terms and conditions.

Allotment	Pasture	Livestock		Period		% PL	Type Use	AUMs
		Number	Kind	Begin	End			
Arnold	--	0	Cattle	3/1	2/28	96	Ephemeral	0

Other Terms and Conditions

- When forage conditions warrant, livestock grazing may be authorized upon application to utilize an ephemeral forage crop pursuant to federal grazing regulations, special management requirements and other guidance.

2.1.2 Beloat Allotment

Mandatory Terms and Conditions

Table 4 Beloat Allotment proposed mandatory terms and conditions for Alternative A.

Allotment	Pasture	Livestock		Period		% PL	Type Use	AUMs
		Number	Kind	Begin	End			
Beloat	--	287	Cattle	3/1	2/28	83	Active	2859

Other Terms and Conditions

- When forage conditions warrant, livestock grazing may be authorized upon application to utilize an ephemeral forage crop pursuant to federal grazing regulations, special management requirements and other guidance.

2.2 ALTERNATIVE B – RESOURCE PROTECTION

Under Alternative B, the Resource Protection Alternative, the Arnold and Beloat permits would be renewed for a period of 10 years with modifications to the terms and conditions (see 2.2.1 and 2.2.2). This Alternative is informed by the 2024 SDNM Complex LHE and conforms with the 2024 SDNM Grazing RMPA ensuring no perennial grazing within the SDNM.

2.2.1 Arnold Allotment

The Arnold Allotment would continue to be an ephemeral only allotment, but relative to Alternative A, there are additional constraints on the requirements. The constraints include rain requirements, a reduction in the approvable ephemeral forage utilization by cattle to 40%, and a specified duration for individual grazing periods to conform with BLM Arizona's current guidelines. The Arnold Allotment is managed as an ephemeral grazing allotment, so management does not differ from the SDNM grazing

management required by the 2024 SDNM Grazing RMPA (DOI-BLM-AZ-P040-2024-0001-RMP-EA). Fencing divides the allotment into three pastures (Figure 2): West, East, and Steer (center).

Mandatory Terms and Conditions

Table 5 Alternative B Arnold Allotment proposed mandatory terms and conditions.

Allotment	Pasture	Livestock		Period		% PL	Type Use	AUMs
		Number	Kind	Begin	End			
Arnold	--	0	Cattle	3/1	2/28	96	Ephemeral	0

Other Terms and Conditions

- When forage conditions warrant, livestock grazing may be approved upon application to utilize an ephemeral forage crop pursuant to federal grazing regulations, special management requirements and other guidance including:
    - Total rain-year precipitation at the time of application must be 90% or greater of the 20-year average expected before ephemeral grazing may be approved. The annual rain-year begins October 1 and ends September 30.
    - No more than 40% of available ephemeral forage may be utilized.
    - Ephemeral grazing may be approved for up to 60 days except between April 1 to September 30 where applications may only be approved for up to 30 days.
- The permittee/lessee must properly complete, sign and date an Actual Grazing Use Report Form (BLM Form 4130-5) annually. The completed form(s) must be submitted to the BLM, Lower Sonoran Field Office (LSFO) within 15 days from the last day of authorized annual grazing use (43 CFR 4130.3-2(d)).

2.2.2 Beloat Allotment

This alternative includes an 84.9% reduction in perennial AUMs in response to degraded land health. The type of use in the SDNM (Southwest) pasture is converted to Ephemeral Only to conform to the 2024 SDNM Grazing RMPA (BLM 2024). The Northwest Pasture would be closed to protect riparian habitat and the Gila River which contains habitat for endangered species. The Northwest Pasture may be reopened once fencing along the northern border of the BLM-managed lands or a virtual fence is installed to prevent cattle from entering the riparian habitat. The environmental effects of new fencing are not being analyzed here but would be analyzed in a subsequent environmental assessment. The West and Southeast Pastures would only be authorized for ephemeral use to respond to a lack of perennial palatable species, and the Estrella Pasture would have a reduction in AUMs through a constrained season of use. Relative to Alternative A, there are additional constraints on the requirements before Ephemeral grazing may commence. The constraints are the same as those for the Arnold Allotment in this alternative. The existing pasture fencing for the SDNM or Southwest Pasture (Figure 3) extends beyond the SDNM boundary ensuring the SDNM pasture is not impacted by perennial grazing. In addition, the Southeast and West Pastures that border the SDNM pasture will be managed as ephemeral only as well, providing an additional buffer between the SDNM and perennial grazing pastures. Alternatively, virtual fencing may be used to prevent cattle from entering the SDNM.

Mandatory Terms and Conditions

Table 6 Alternative B Beloat Allotment proposed mandatory terms and conditions.

Allotment	Pasture	Livestock		Period		% PL	Type Use	AUMs
		Number	Kind	Begin	End			
Beloat	Northeast	18	Cattle	3/1	2/28	83	Active	226
Beloat	Estrella	41	Cattle	11/1	3/30	83	Active	207

Allotment	Pasture	Livestock		Period		% PL	Type Use	AUMs
		Number	Kind	Begin	End			
Beloat	Southeast	0	Cattle	3/1	2/28	83	Ephemeral	0
Beloat	West	0	Cattle	3/1	2/28	83	Ephemeral	0
Beloat	SDNM/Southwest	0	Cattle	3/1	2/28	83	Ephemeral	0

Other Terms and Conditions:

- When forage conditions warrant, livestock grazing may be approved upon application to utilize an ephemeral forage crop pursuant to federal grazing regulations, special management requirements and other guidance including:
    - Total rain-year precipitation at the time of application must be 90% or greater of the 20-year average expected before ephemeral grazing may be approved. The annual rain-year begins October 1 and ends September 30.
    - No more than 40 percent of available ephemeral forage may be grazed.
    - Ephemeral grazing may be approved for up to 60 days except between April 1 to September 30 where applications may only be approved for up to 30 days.
- Livestock shall be removed from a pasture once utilization of any perennial palatable species reaches an average of 35%.
- No grazing may occur in the northwest pasture without physical or virtual fence to control livestock movement and prevent livestock drift into the Gila River, riparian corridor, and the Gila Waterfowl Wildlife Management Area. New fencing must be approved through NEPA analysis.
- The permittee/lessee must properly complete, sign and date an Actual Grazing Use Report Form (BLM Form 4130-5) annually. The completed form(s) must be submitted to the BLM, Lower Sonoran Field Office (LSFO) within 15 days from the last day of authorized annual grazing use (43 CFR 4130.3-2(d)).

2.3 ALTERNATIVE C – EPHEMERAL GRAZING ONLY

Under Alternative C, the Ephemeral Grazing Only Alternative, all pastures in the Allotments would be converted to Ephemeral Only along with other modifications to the terms and conditions for both the Arnold (Table 7) and Beloat (Table 8) Allotments. This Alternative is informed by the 2024 SDNM Complex LHE and conforms with the 2024 SDNM Grazing RMPA by ensuring no perennial grazing within the SDNM.

2.3.1 Arnold Allotment

For the Arnold Allotment, there is no difference between Alternative B and C. The terms and conditions are the same.

Mandatory Terms and Conditions

Table 7. Arnold Allotment mandatory terms and conditions for Alternative C.

Allotment	Pasture	Livestock		Period		% PL	Type Use	AUMs
		Number	Kind	Begin	End			
Arnold	--	0	Cattle	3/1	2/28	96	Ephemeral	0

Other Terms and Conditions

- When forage conditions warrant, livestock grazing may be approved upon application to utilize an ephemeral forage crop pursuant to federal grazing regulations, special management requirements and other guidance including:
    - Total rain-year precipitation at the time of application must be 90% or greater than the 20-year average expected before ephemeral grazing may be approved. The annual rain year begins October 1 and ends September 30.
    - No more than 40 percent of available ephemeral forage may be grazed.
    - Ephemeral grazing may be approved for up to 60 days except between April 1 to September 30 when applications may only be approved for up to 30 days.

- The permittee/lessee must properly complete, sign and date an Actual Grazing Use Report Form (BLM Form 4130-5) annually. The completed form(s) must be submitted to the BLM, Lower Sonoran Field Office (LSFO) within 15 days from the last day of authorized annual grazing use (43 CFR 4130.3-2(d)).

2.3.2 Beloat Allotment

Alternative C eliminates all perennial grazing from the Beloat Allotment. This is an additional reduction of 433 AUMs relative to Alternative B. The terms and conditions for ephemeral grazing are the same for Alternative B and C. The existing pasture fencing for the SDNM or Southwest Pasture (Figure 3) extends beyond the SDNM boundary ensuring the SDNM pasture is only grazed when authorized. If grazing is approved in parts of the allotment, but not in the SDNM pasture, the fences would constrain cattle to the appropriate pastures. Alternatively, virtual fencing may be used to prevent cattle from entering the SDNM.

Mandatory Terms and Conditions

Table 8. Beloat Allotment mandatory terms and conditions.

Allotment	Pasture	Livestock		Period		% PL	Type Use	AUMs
		Number	Kind	Begin	End			
Beloat	--	0	Cattle	3/1	2/28	83	Ephemeral	0

Other Terms and Conditions

- When forage conditions warrant, livestock grazing may be approved upon application to utilize an ephemeral forage crop pursuant to federal grazing regulations, special management requirements and other guidance including:
    - Total rain-year precipitation at the time of application must be 90% or greater than the 20-year average expected before ephemeral grazing may be approved. The annual rain year begins October 1 and ends September 30.
    - No more than 40 percent of available ephemeral forage may be grazed.
    - Ephemeral grazing may be approved for up to 60 days except between April 1 to September 30 when applications may only be approved for up to 30 days.

- No grazing may occur in the northwest pasture without physical or virtual fence to control livestock movement and prevent livestock drift into the Gila River, riparian corridor, and the Gila Waterfowl Wildlife Management Area. New fencing must be approved through NEPA analysis.
- The permittee/lessee must properly complete, sign and date an Actual Grazing Use Report Form (BLM Form 4130-5) annually. The completed form(s) must be submitted to the BLM, Lower Sonoran Field Office (LSFO) within 15 days from the last day of authorized annual grazing use (43 CFR 4130.3-2(d)).

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2.4 ALTERNATIVE D – NO GRAZING ALTERNATIVE

Under the No Grazing alternative, the BLM would not authorize grazing on the BLM-managed lands of the Arnold and Beloat Allotments, both inside and outside of the SDNM boundary. Grazing on private lands and on Arizona State Trust Land leases would be expected to continue.

2.5 SUMMARY OF ALTERNATIVES

Table 9 Comparison of potential AUMs between alternatives. Alternative D would make the Arnold and Beloat Allotments unavailable to graze.

Allotment	Alternative A	Alternative B	Alternative C	Alternative D
Arnold	Ephemeral	Ephemeral	Ephemeral	0 AUMs
Beloat	2859 AUMs	433 AUMs	Ephemeral	0 AUMs

2.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

2.6.1 Remove Livestock Grazing from the SDNM

Under this alternative, the BLM would not authorize livestock grazing on BLM-managed lands in the portion of the Allotments that occur within the SDNM. The BLM would continue to authorize livestock grazing on BLM-managed lands located within the portion of the Allotments outside of the SDNM.

Rationale for elimination from detailed analysis: The BLM is analyzing three alternatives that include substantial decreases or the elimination of grazing within the SDNM portion of the Allotments. The No Grazing, Ephemeral Grazing, and Resource Protection alternatives would limit grazing in the SDNM and addresses the results of the Land Health Evaluation.

Under the No Grazing alternative, the BLM analyzes the effect of eliminating livestock grazing on the BLM-managed lands within the SDNM and beyond making the analysis of an alternative that eliminates grazing just from the portion of the Allotments in the SDNM redundant.

2.6.2 Remove Livestock Grazing from All Ecological Sites that Do Not Meet Standards for Rangeland Health

Under this alternative, the BLM would not authorize livestock grazing on BLM-managed lands that have ecological sites with plant communities that are not meeting Standards for Rangeland Health as described in the 2024 SDNM Complex LHE.

Rationale for elimination from detailed analysis:
Ecological sites and plant communities form a mosaic within pastures. Monitoring locations for a specific ecological site within a specific pasture may have met grazing standards despite the overall ecological site type not meeting standards overall. Further, soil component data is not fine scale enough to differentiate ecological sites within a soil map unit making a spatial analysis impractical. Analyzing the overall health of pastures in the EA is more appropriate for implementing grazing management in individual allotments. Managing pastures with existing fences is also less destructive than installing new fencing would be.

The No Grazing alternative analyzes the effect of eliminating grazing on all BLM-managed lands within the Arnold and Beloat Allotments. The Resource Protection Alternative analyzes the effect of reducing but not eliminating grazing. An alternative that eliminates grazing just from those portions of the Allotments that are not meeting standards would be redundant.

3 Affected Environment & Environmental Consequences

This chapter identifies and describes the current condition and of resources in the human environment which may be affected by the alternatives. The Affected Environment is the same for all alternatives.

3.1 General Setting

The Planning area is the analysis area, it encompasses all of the lands within the Arnold and Beloat Allotments. Those lands include BLM managed land within and outside the SDNM (Table 1). The analysis area includes the BLM managed lands, land managed by other federal agencies, Arizona State Land Department, Native American Reservations lands, and private lands (Table 2). There are also other special designated areas including the Lower Gila Terrace Area of Critical Environmental Concern, the de Anza National Historic Trail Management Area, and the North Maricopa Mountains wilderness and the Sierra Estrella Wilderness area.

3.2 Types of Effects

In this document, the terms “effect” and “impact” are used synonymously. Effects fall into two categories:

- ***Direct***: caused by the action and occur at the same time and place.
- ***Indirect:*** caused by the action, but occur later in time or further in distance, but are still reasonably foreseeable.

For the purpose of this analysis, direct or indirect impacts are referred to as “impacts.”

3.3 Will the Proposed Grazing Management Pose A Risk to Land Health?

3.3.1 Land Health Affected Environment

This analysis incorporates by reference the analysis and citations used in the discussion of the Affected Environment, Environmental Consequences, and Past, present, and foreseeable future Effects in the Vegetation and Noxious Invasive Weed Species section (section 3.6, pages 24-30) of the SDNM Grazing RMPA EA (DOI-BLM-AZ-P040-2024-0001-RMP-EA). That section categorizes the impact of grazing on plant communities and on weeds within the entire SDNM. Portions of both the Allotments are included within the SDNM. The discussion below expands on that analysis.

3.3.1.1 Rangeland Health Standards

The BLM land health objectives are specific to each of Arizona’s Standards for Rangeland Health (Table 10), and objectives were developed using indicators associated with these Standards (LHE, Appendix 1, pages 33-35). The achievement of these Standards ensures maintenance of rangeland health, Arizona water quality standards, and wildlife habitat including endangered, threatened, and sensitives species. This analysis focuses on Standards 1 and 3. Though a small section of the BLM managed land does border the Gila River, there are no waters cattle will have access to that would allow them to reach the Gila River. Therefore, Standard 2 was not analyzed. For Standard 1, the rating of Moderate Departure or less based on the Interpreting Indicators of Rangeland Health methodology (Pellant et al. 2020) was considered meeting the standard. Standard 3 objectives were met if the threshold for more than half the characteristics was met. The characteristics and required thresholds are described in the LHE for foliar cover, palatable species composition, and diversity of perennial species (Appendix 1, pages 34-35).

Table 10 Applicable Arizona Bureau of Land Management Rangeland Health Standards.

Grazing Standard	Description
1- Upland Sites	Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate and landform (ecological site).
2- Riparian-Wetland Sites	Riparian-wetland areas are in proper functioning condition.
3- Desired Resource Conditions	Productive and diverse upland and riparian-wetland communities of native species exist and are maintained.

Monitoring data were originally collected in 2017-2018. The data included Interpreting Indicators of Rangeland Health (Pellant et al. 2020), Soil Stability, line intercept, line point intercept and belt transects. Data were collected on 10 parallel transects in a site that was 100 feet by 300 feet.

In 2022, BLM Arizona began collecting Assessment Inventory and Monitoring (AIM) data. During the 2023 data collection, five sites from the 2017-2018 data collection were revisited in an effort to measure changes over the intervening time within the Beloat Allotment. At the time the Land Health Evaluation was revised in January 2024 for the SDNM Grazing RMPA EA, data review for errors and quality control at the National Operations Center had not been completed for the 2023 data. In addition to the five revisit sites in the Beloat Allotment, AIM data were collected at two new sites in both 2022 and 2023. With the quality control completed, 2023 data from the revisit sites and the four additional sites are incorporated into the analysis. AIM core methods were used (Canopy Gap, Line Point Intercept, Soil Stability, Species Inventory, Soil Pits) and the supplementary method of 2-meter belt transects was added. The 2022/2023 AIM protocol differs from the 2017/2018 protocol in that data were collected from only three 25-meter transects that form three equidistant spokes in a circular site with a 30-meter radius.

3.3.1.2 Standard 1 Soils and Landform

Landforms in the analysis area consist of broad, alluvial basin floors separated by basaltic or granitic mountains, hills, and rock outcrops, dissected by several major drainages and numerous ephemeral ones. The soils range from shallow to deep, usually calcareous, sandy loams. Upland parts of the basins are carved by desert washes with soils that are coarse- to medium-textured and cobbly to gravelly on the surface. Soils located higher on broad alluvial fans often derive directly from upslope bedrock and are underlain by a caliche layer. Farther down, alluvial fans often occur with loamier texture in the upper horizons and often contain a less distinct carbonate layer. Biotic crusts and desert pavement are common in the analysis area and provide increased soil stability, water infiltration (Belnap 1995) and protection against wind and surface-sheet erosion (BLM 2001). Qualitative and quantitative soil-resource data is available from the National Resource Conservation Service soils surveys (NRCS 1997). For additional information on Soils Resources in the analysis area see Section 3.2.6 of the Lower Sonoran/SDNM FEIS (BLM 2012).

Though overgrazing can lead to increased bare ground and risk of soil erosion, other human activities in the analysis area also impact soils in the SDNM. Wildfires, building construction, and linear rights of way such as pipelines and roads contribute to sedimentation rates at 3-4 times greater rates than grazing (Jeong & Dorn 2019). Wildfire reduces soil aggregate stability, increasing soil and micronutrient loss (Morra et al. 2024) and increase soil compaction (Morra et al. 2024) for at least two years after a fire. The increased use of public lands since Covid-19 has resulted in more damage from off-road vehicles and increased the chance of fire ignition. Clearing and construction for solar developments and expanding suburban development, OHV use, and risk of wildfire in the planning area are expected to have greater impacts on soils than some grazing management options (Jeong & Dorn 2019).

The BLM incorporates by reference the discussion on grazing impacts to soil erosion and the benefits of grazing on soil resources found in the 2024 SDNM Grazing RMPA/EA (BLM 2024, section 3.8.2, page 38). Further specific information on each allotment follows:

Arnold Allotment

The soils range from shallow granitic hills in the north to deeper alluvial fans in the south. Elevation in the area ranges from 900 ft. to 1,500 ft. There are three dominant ecological sites within the Arnold Allotment: Granitic Upland, Limy Fans, and Limy Uplands. The National Resource Conservation Service soil data indicates this area is in a precipitation zone of 7-10 inches. Since the 1980s, the average precipitation has been between 5.44 inches (Tuthill) to 6.69 inches (Estrella Fan) with the analysis area averaging 6.0 - 6.5 inches (Section 3.7, Figure 8). More information on the soils and ecological sites is available in the LHE (Appendix 1, Section 3.3, p.9-15).

All of the ecological sites in the Arnold Allotment met Grazing Standard 1 which addresses soils. A single monitoring site did not meet Grazing Standard 1 because of Hydrological function objectives but did meet management objectives (Figure 4).

When data were analyzed by vegetation communities, grazing was determined to cause 12.5% of the Creosote – Bursage plant community to not achieve Grazing Standard 1. However, the vast majority of the plant community was meeting Standard 1. The Palo Verde – Mixed Cactus community met Standard 1 objectives (Appendix 1, Section 8.1, p44-47).

Beloat Allotment

The soils range from shallow calcareous granitic hills in the west, and deep alluvial fans in the valley, to moderately deep non-calcareous soils in the east. The dominant ecological sites within the Arnold Allotment are Granitic Upland, Limy Fan, Limy Upland, Limy Upland Deep, Sandy Bottom, Sandy Loam Deep, and Sandy Loam Upland. Elevation in the area ranges from 1,100 ft. to 2,493 ft. The National Resource Conservation Service soil data indicates this area is in a precipitation zone of 7-10 inches. Since the 1980s, the average precipitation has been between 5.44 inches (Tuthill) to 6.69 inches (Estrella Fan) with the analysis area averaging 6.0 - 6.5 inches (see Section 3.7, Figure 8). More information on the soils and ecological sites is available in the Land Health Evaluation (Appendix 1, Section 3.3, p9-15).

Grazing Standard 1 was not met on Sandy Loam Deep or Sandy Loam Upland ecological sites (Figure 5) typically because soils and either hydrologic or biologic function was impaired (Appendix 1, section 8.2, pages 47-51). Sandy Loam Deep and Upland sites were located primarily in the eastern three pastures. At those sites, the magnitude of the deviations from expected soil and hydrological function exceeded the objective. The reason for that deviation was cattle grazing activity. The other five ecological sites achieved Standard 1 (Appendix 1, section 8.2, p47-51).

When analyzed by plant community, grazing, i.e., damage caused by cattle activity, was the cause for 50% of the Palo Verde – Mix Cactus and 9% of the Creosote Bursage communities not achieving Standard 1.

3.3.1.3 Standard 3: Desired Resource Conditions- Plant Community

A variety of native plant species exist in the analysis area. The dominant species include *Larrea tridentata, Plantago ovata, and Lesquerella gordonii*. *Ambrosia deltoidea* and *A. dumosa* are common as is the small forb *Chorizanthe rigida*. Other species include *Lotus*, *Lupinus, Astragalus, Pectocarya, Lepidium*, *Cryptantha*, *Amsinckia, Castilleja, Parkinsonia*, and *Vulpia*. More information on Sonoran Desert scrub species is available in the SDNM Grazing RMPA (BLM 2024, section 3.6.1). The AIM data collection in 2022 - 2023 did not include sites in the Arnold Allotment, but they identified 108 plant species in the Beloat Allotment. The three ecological sites in the Arnold Allotment are also in the Beloat Allotment, so many of the species detected through monitoring are likely also in the Arnold Allotment.

The action area includes four nonnative species. *Erodium cicutarium* (storksbill, filaree), *Schismus barbatus* (Mediterranean grass), *Brassica tournefortii* (Sahara, Asian, or African mustard), and *Oncosiphon piluliferum* (stinknet, globe chamomile). The data from 2017-2018 did not include annual species, however data from the AIM monitoring efforts in 2022 and 2023 in the Beloat Allotment and 2024 ephemeral grazing monitoring in the Arnold Allotment, and inspection surveys for the Sonoran Solar ROW provide data on nonnative annual species.

Arnold Allotment

Data was collected on perennial species between 2016 and 2018. In addition to the dominant upland species *Larrea tridentata*, there was also *Encelia farinosa* and species in the *Ambrosia*, *Krameria*, and *Lycium* genera were found throughout the allotment. Common tree species included *Parkinsonia floridia*, *P. microphylla*, and *Olneya tesota*. There were a variety of cacti species.

An ephemeral inspection in April 2024 found *Plantago ovata* dominated the annual plant community within the allotment. Other ephemeral forage assessment locations also had *Erodium*, *Lepidium, Schismus,* or a small unknown forb species. *Schismus* was only dominant at one site near a corral in the Steer Pasture (Figure 2) with *Oncosiphon piluliferum* and *Schismus* found in the corral. In April 2024, 564 pounds/acres of forage was deemed acceptable for cattle use around the Arnold Pipeline Trough, Quarter Corner Well, and Rainbow Pasture Well (Figure 2), however there was no grazing authorized in 2024 because fences and waters were not fully functional. Ephemeral grazing applications are only based on the presence of annual species, so perennial species data was not collected in 2024.

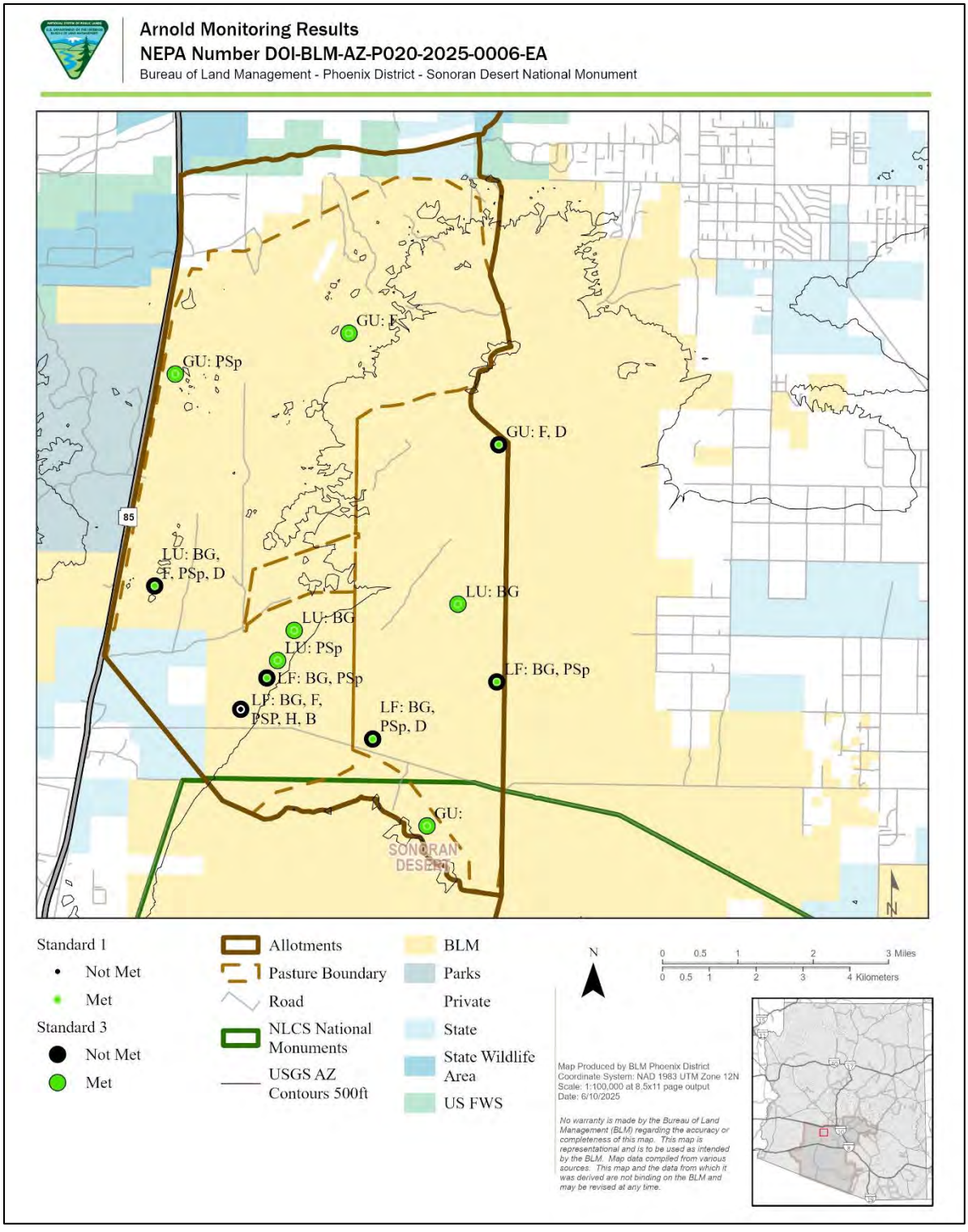

Figure 4 Results of land health monitoring in the Arnold Allotment. Circles note sites where land health standards were met (green) or not (black) for both range health standard 1 (inset small circle) and standard 3 (large outer circle). The first two letters of a site indicate the ecological site Granitic Upland (GU), Limy Upland (LU), or Limy Fan (LF). The letters following the colon indicate what, if any objectives were not met for land health standards 1 or 3. Abbreviations for the objectives include F (Foliar cover), BG (bare ground cover), PSp (Palatable plant species composition), D (species diversity), H (hydrological function), B (Biotic function), and S (soils functions).

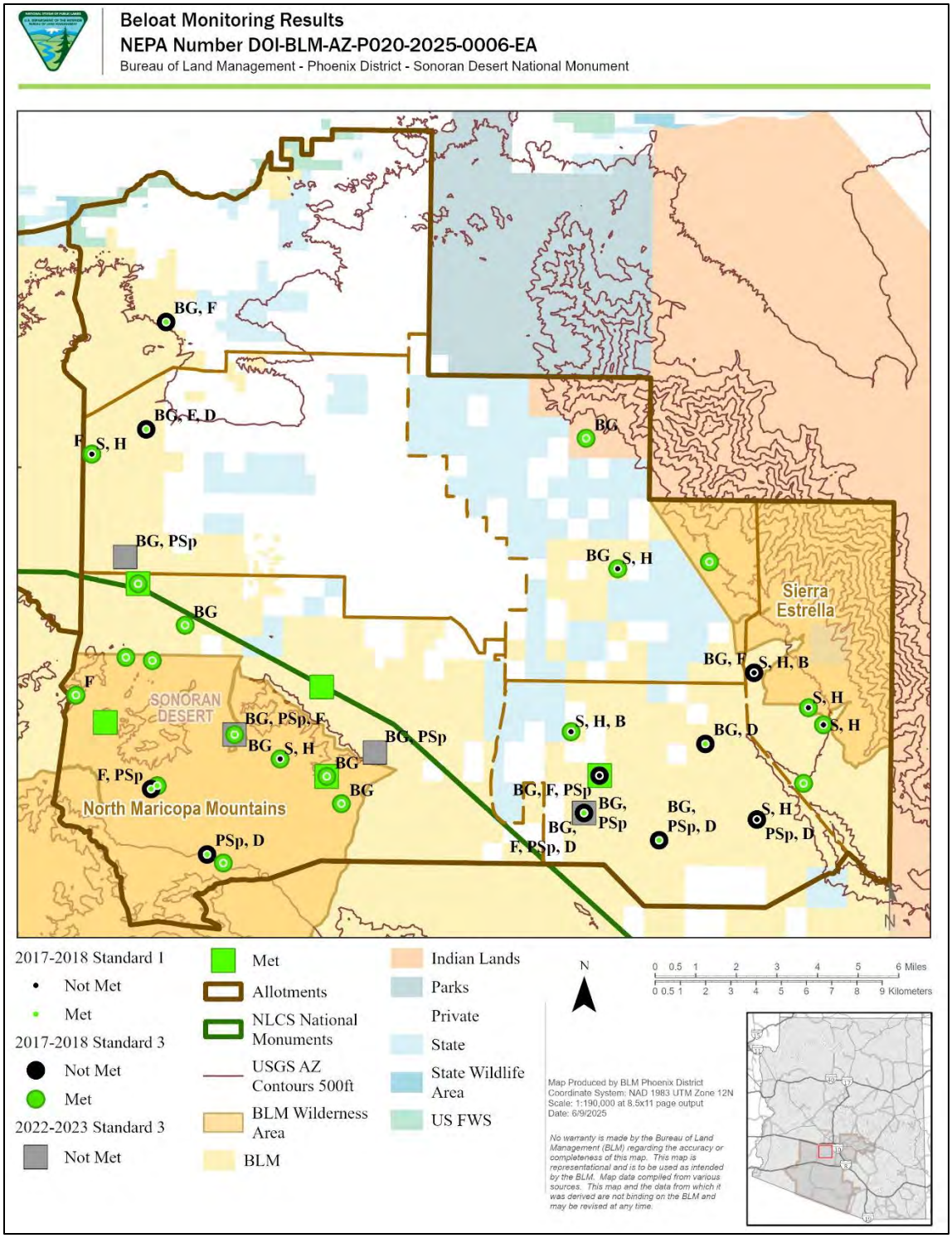

Figure 5 Results of land health monitoring in the Beloat Allotment. Circles note sites where land health standards were met (green) or not (black) for both range health standard 1 (inset small circle) and standard 3 (large outer circle). The first two letters of a site indicate the ecological site Granitic Upland (GU), Limy Upland (LU), or Limy Fan (LF). The letters following the colon indicate what, if any objectives were not met for land health standards 1 or 3. Abbreviations for the objectives include F (Foliar cover), BG (bare ground cover), PSp (Palatable plant species composition), D (species diversity), H (hydrological function), B (Biotic function), and S (soils functions).

Schismus was located in the steer pasture within the corral and at two sampling sites within 500 ft of the corral at Quarter Corner Well (Figure 2). *Oncosiphon piluliferum* was found in the corral of steer pasture, but not noted elsewhere. During inspection surveys for the Sonoran Solar ROW, *Brassica tournefortii* was located where the road leading to the solar field cross washes. *Brassica* was also found in drainages throughout the Sonoran Solar ROW and within the project most highly concentrated in the eastern side of the ROW and along the fence lines. *Erodium cicutarium* was located at a few forage collection sites.

The Arnold Allotment met Standard 3 objectives for the Granitic Upland and Limy Upland ecological sites (Figure 4). The Limy Fan ecological sites were determined to not meet desired plant community objectives, because of excessive bare ground and a lack of palatable perennial species (Figure 4, details in Appendix 1, section 8.1, p44-47).

When data were analyzed by vegetation community, 62.5% of the Creosote – Bursage communities, did not meet objectives for Standard 3. Grazing was determined to be the cause of 25% of the community not meeting Standard 3; the remaining 37.5% was caused by recreational use or other causes. In the Palo Verde – Mixed Cactus community, 25% of the community was not achieving Standard 3 objectives, but the reason was not determined to be cattle grazing (Appendix 1, section 8.1, p44-47).

Beloat Allotment

The most common plant species detected in 2022 – 2023 included *Larrea tridentata* and *Plantago ovata* found at all 9 sites and *Lesquerella gordonii* found at 7 sites. The shrubs *Ambrosia deltoidea* (6 sites) and *A. dumosa* (4) are common as is the small forb *Chorizanthe rigida* (5). Other genera included in monitoring data are Lotus (3 species, 4 sites), *Lupinus* (4 species, 5 sites), *Astragalus* (4 sites), *Pectocarya recurvata* (4 sites), *Lepidium (3 species, 8 sites)*, *Cryptantha (3 species, 4 sites)*, *Amsinckia (2 species, 6 sites), Castilleja* (2 species 4 sites), *Parkinsonia (2 species 6 sites)*, and *Aristida purpurea* (3 sites).

Four nonnative species are present in the Beloat Allotment. *Brassica tournefortii* was found in drainages in the western pasture and throughout the Sonoran Solar ROW concentrated in the eastern side of the ROW and along its fence line. The AIM surveys found *Brassica tournefortii* (four sites), *Schismus barbatus* (6 sites) and two species of *Erodium: E. cicutarium* (3 sites) and *E. texanum* (1 site). Records on iNaturalist suggest *Oncosiphon piluliferum* is located in the Northwest and Western pastures along roads, farm fields and neighborhoods (https://www.inaturalist.org/taxa/78258-Oncosiphon-pilulifer).

Two of the four Sandy Loam Deep ecological sites within the Beloat Allotment did not meet Grazing Standard 3 (Figure 5), leading to a conclusion that the entire ecological site did not meet that standard; grazing was determined to be the causal factor. Limy Upland Deep sites did not meet Standard 3 (Figure 5), but the BLM was unable to determine a consistent reason for Limy Upland Deep sites not meeting Standard 3. When analyzed by plant community, cattle were determined to be the cause for 9% of Creosote – Bursage, 25% of Ephemeral Wash, and 28.6% of Palo Verde – Mixed Cactus communities not meeting Standard 3 (Appendix 1, section 8.1, p47-51).

In recent years, the permittee has grazed the eastern pastures, avoiding the pastures within the SDNM. Utilization data was collected in those three pastures in 2021. At the four sites where data were collected six of seven utilization assessments had key forage species utilization recorded below 30%, with the last below 32% (Table 11). This is within the realm of conservative grazing forage utilization that is determined to be sustainable for deserts (Holechek et al. 1999, 2006).

AIM data were collected at nine monitoring sites in the Beloat Allotment in 2022 and 2023. Five sites were sites first established in 2017 or 2018 and revisited in 2023 (Table 12). When site B-SLU-04 was revisited in 2023, the site improved and met Standard 3 desirable resource objectives. In 2023, site B-GU-01 did not meet desirable resource objectives but it was in 2017 (Table 12). This is likely a factor of fewer transects used in the AIM protocol. In 2017, palatable species cover was low (3%) and could have easily been missed by differences in protocol sampling methods. The data collected did not alter the fact that the majority of Granitic Uplands sites met Standard 3 objectives. The soil pit data collected at the AIM site LSFO 2022-023 indicated it was a Sandy Loam Deep Site. That site met the desirable resource condition objectives for that ecological site (Table 12). The additional data indicate that 3 of 5 monitoring locations in that ecological site met standards. Based on that, the entire ecological site is meeting standards. Data

Table 11 Utilization data collected in the Beloat Allotment in 2021 and 2025.

Species	Pasture	Utilization (%)	Date
Pleuraphis rigida	Northeast	26.8	April 13, 2021
Parkinsonia florida	Northeast	26.6	April 13, 2021
Pleuraphis rigida	Estrella	31.3	April 13, 2021
Ambrosia dumosa	Estrella	7.8	April 13, 2021
Pleuraphis rigida	Southeast	27.7	April 13, 2021
Ambrosia dumosa	Southeast	4.95	April 13, 2021
Pleuraphis rigida	Estrella	11.31	December 15, 2021

Table 12 Desirable resource condition for sites where data was collected in 2022 and 2023. Bold text indicates objective was met. Below indicates whether the site was visited in for the Land Health Evaluation data collection in 2017-2018 and whether the site met Standard 3 or not in both time periods. All sites visited in 2022 or 2023 used the Assessment Inventory and Monitoring protocol. New sites established in 2022 or 2023 begin with LFSO.

Desired Resource Condition Objective	**B-GU -1**	**B-LF -3**	**B-LUD -4**	**B-LU -2**	**B-SLU -4**	**LSFO 2022 - 002**	**LSFO 2022 - NR-003**	**LSFO 2022 - 023**	**LSFO 2022 - 061**
Ecological Site	Granitic Upland	Limy Fan	Limy Upland Deep	Limy Upland	Sandy Loam Upland	Limy Fan	Limy Fan	Sandy Loam Deep	Limy Fan
Bare Ground	39.3	21.3	56.6	27.3	34.0	24.0	50.0	9.3	33.3
Foliar Cover	11.1	56.7	29.3	36.0	64.0	34.7	20.7	24.0	45.3
Palatable Species	0.0	0.0	0.0	23.8	33.3	42.9	0.0	3.7	0.0
Shannon Diversity Index	1.43	1.25	0.86	2.23	1.77	1.17	1.10	1.44	0.90
Std 3 met in 2018	Y	Y	N	Y	N	-	-	-	-
2022						Y	N	Y	
2023	N	Y	N	Y	Y				N

Table 13 Table showing achievement by ecological site including the data collected in 2022 and 2023. Updates were made to the five revisited sites. Data from the four new monitoring sites established for the AIM data collection were also incorporated. This increases the number of sites in the Limy Fan and Sandy Loam Deep ecological site relative to the analysis described in the Land Health Evaluation on page 49 (Appendix 1).

Ecological Site	Plots (n)	Plots Achieved Standard 3 (n)	Ecological Site Achieved Standard 3?	Causal Factor For Non-Achievement
Granitic Upland	4	4	Yes	N/A
Limy Fan	7	5	Yes	N/A
Limy Upland	4	3	Yes	N/A
Limy Upland Deep	4	1	No	Unknown*
Sandy Bottom	4	3	Yes	N/A
Sandy Loam Deep	5	3	Yes	N/A†
Sandy Loam Upland	5	4	Yes	N/A

** - Photos from 2023 continue to show no evidence of cattle use.*

†- Addition data collected in 2022 means more than 50% of sites are meeting standards. Where the standards were not met, cattle grazing was the cause in 2017.

were also collected in Limy Fan sites (Table 12). The data collected did not change the determination that the ecological site met desirable resource conditions. The BLM incorporated the new data and revised the table in section 8.2 of the LHE (

Table 13).

3.3.2 Land Health Environmental Impacts

3.3.2.1 Standard 1 Soils and Landforms Impacts

Analysis Common to All Alternatives

The Land Health Evaluation determined that soils in most ecological sites did not deviate significantly from expected conditions in the Arnold and Beloat Allotments (Appendix 1). This suggests that ephemeral grazing is suitable for protecting soil resources and hydrological functions. Biotic crusts and desert pavement are common in the analysis area and provide increased soil stability, water infiltration (Belnap 1995) and protection against wind and surface-sheet erosion (BLM 2001). Additional analysis is detailed in the 2024 SDNM Livestock Grazing RMPA EA DOI-BLM-AZ-P040-2024-0001-RMP-EA in the following sections: vegetation 3.6 and 4.8 (pp 24-30, 62-65); soils 3.8 and 4.10 (pp 37-4, 66-69); Air Resources 3.10 and 4.12 (pp 45-48, 71-73).

Alternative A: No Action

Arnold

Ephemeral grazing, if approved, would only occur during wet seasons when biological crusts are less vulnerable to damage by livestock grazing activities (BLM 2001). The flexibility and criteria required to approve ephemeral grazing would help protect vegetative and biological crust cover and prevent potential impacts to soils.

Beloat

The Land Health Evaluation determined grazing was the causal factor for soil and hydrological functions not being met in the Estrella and Southeast Pastures (Appendix 1). Grazing at current levels in the Estrella and Southeast pastures may further degrade soil and hydrological function. In the western portion of the allotment, soil and hydrological function was only degraded at one of sixteen sites (Figure 5). In the West Pasture, one of two sites did not meet soil and hydrological objectives for Standard 1 (Figure 5), but the causal factor could not be determined because there was no evidence of cattle use at that site. Ephemeral grazing, if approved, would only occur during wet seasons when biological crusts are less vulnerable to damage by livestock grazing activities (BLM 2001) and should prevent degradation in the SDNM (Southwest) pasture.

Alternative B: Resource Protection

Arnold

Ephemeral grazing, if approved, would only occur during wet seasons when biological crusts are less vulnerable to damage by livestock grazing activities (BLM 2001). This alternative would limit the amount of ephemeral forage for cattle to 40%. This limitation would result in an associated decrease in the impact to soils relative to Alternative A and would result in the same potential for disturbance as Alternative C. Selecting the Resource Protection Alternative would result in less soil disturbance and could help improve biotic crust establishment in the 12.5% of Creosote-Bursage community not meeting Standard 1.

Beloat

Grazing was the causal factor for soil and hydrological functions not being met in the eastern pastures: Northeast, Estrella, and Southeast (Figure 5). In the western portion of the allotment, soil and hydrological function was only degraded at one of sixteen sites (Figure 5). In the West pasture, one of two sites did not meet soil and hydrological objectives (Figure 5), but the causal factor could not be determined because there was no evidence of cattle use at that site. Alternative B reduces the number of Active AUMs by 84.9% relative to current grazing management (Alternative A). As a result, the soil disturbances in the Estrella, Southeast, West, and Southwest Pastures would decrease. This alternative would limit the amount of ephemeral forage for cattle to 40% which also decreases the number of cattle and associated disturbance. Ephemeral grazing, if approved, would only occur during wet seasons when biological crusts are less vulnerable to damage by livestock grazing activities (BLM 2001) and should prevent the degradation in the SDNM (Southwest), West, and Southeast pastures. Compared to the No Action Alternative, selecting the Resource Protection Alternative would result in less soil disturbance and

improve the ability for biotic crust and plants to establish which would decrease soil erosion features when in the Sandy Loam Deep and Sandy Loam Upland ecological sites.

Alternative C: Ephemeral Grazing

Arnold

Alternatives B and C have the same terms and conditions for the Arnold Allotment. The impact on soils and ecological sites would be the same.

Beloat

Grazing was the causal factor for soil and hydrological functions not being met in the eastern pastures: Northeast, Estrella, and Southeast (Figure 5). In the western portion of the allotment, soil and hydrological function was only degraded at one of sixteen sites (Figure 5). In the West pasture, one of two sites did not meet soil and hydrological objectives (Figure 5), but the causal factor could not be determined because there was no evidence of cattle use at that site. Alternative C would eliminate perennial AUMs and turn the Beloat Allotment into an Ephemeral Only allotment. Ephemeral grazing, if approved, would only occur during wet seasons when biological crusts are less vulnerable to damage by livestock grazing activities (BLM 2001) and should prevent soil degradation within the allotment. As a result, the soil disturbances in the Estrella, Southeast, West, and Southwest Pastures would decrease. Selecting the Ephemeral Grazing Alternative would result in less soil disturbance than either Alternative A or B and improve the ability for biotic crust and plants to establish which would decrease soil erosion features in the Sandy Loam Deep and Sandy Loam Upland ecological sites.

Alternative D: No Grazing

Removing cattle from an area with a long grazing history can increase invasive grass cover and reduce native grass cover (Porensky et al. 2020). Removing cattle grazing has led to an increase in *Bromus rubens* cover (Brooks et al. 2006b) and other *Bromus* species (Brooks et al. 2016). Since the impact of grazing on *Schismus* is dependent on soils, *Schismus* may increase or decrease locally (Sassie et al. 2009) in the absence of grazing. *Schismus* increases the likelihood of wildfires in the desert southwest (Fusco et al. 2019). Wildfires, building construction, and linear rights-of-way such as those for pipelines and roads contribute to sedimentation rates at 3-4 times greater rates than grazing (Jeong & Dorn 2019). Wildfire reduces soil aggregate stability, increasing soil and micronutrient loss (Morra et al. 2024) and soil compaction (Morra et al. 2024) for at least two years after a fire. The increased use of public lands since Covid-19 has resulted in more damage from off-road vehicles and increased the chance of fire ignition. Clearing and construction for solar developments and expanding suburban development, OHV use, and risk of wildfire in the planning area are expected to have greater impacts on soils than some grazing management options (Jeong & Dorn 2019).

Livestock grazing has the potential to reduce fine fuels load and continuity (Davies et al. 2010, Davies et al. 2015) contributing to smaller burned areas when fires occur. Winter grazing lowered the maximum fire temperature, decreasing the risk of fire induced plant mortality in the sagebrush steppe (Davies et al. 2015). Cattle remove fine fuel biomass and reduce herbaceous litter resulting in shorter flame lengths and slower rates of spread (Diamond et al. 2012, Bruegger et al. 2016, Schachtschneider et al. 2024) even when utilization is as low as 26% (Bruegger et al. 2016). Moderate grazing prior to a fire can result in significantly lower annual grass cover relative to ungrazed sites (Davies et al. 2016). Sites grazed prior to fire had significantly greater native grass biomass, cover, and density and greater biotic crust cover than ungrazed sites 20 years after a fire (Davies et al. 2016).

Arnold

The greatest risk of annual plant invasion in the allotment is in the steer pasture where *Schismus* and *O. piluliferum* were located in and near the corral. There is also a risk of fuels build up near the roads in the southern portion of the allotment which could result in an accidental fire caused by campers or recreational target shooting. Wildfire would decrease soil stability and result in the loss of topsoil through wind and water erosion.

Beloat

Though the removal of grazing is potentially beneficial in some respects, the SDNM and adjoining Pastures have *Schismus* and *B. tournefortii* which could expand and contribute to increased fire risk. Wildfire would decrease soil stability and result in the loss of topsoil through wind and water erosion.

Wildfire also poses a risk to the housing developments in the Northwest Pasture and agricultural pastures in the West Pasture.

3.3.2.2 Standard 3 Desired Resource Condition- Plant Community Impacts

In the Mojave Desert, *Schismus* species cover (Mediterranean annual grasses) was higher at water troughs and decreased as distance from wells and troughs increased (Brooks et al. 2006b). Grazing was not correlated with changes in the biomass of *Bromus rubens, Schismus arabicus*, *S. barbatus,* or *Erodium cicutarium* in the Mojave Desert (Brooks et al. 2006a). Cattle and mule deer consume *Schismus* before the grass flowers (Krausman et al. 1997, Sassie et al. 2009) providing wildlife with forage, but the impact of cattle grazing on *Schismus* can be site dependent. A study in Argentina found that *Schismus barbatus* density was higher in ungrazed plots in sandy soils, higher in grazed plots in creosote stands, and unaffected in mesquite ecosystems (Sassie et al. 2009). Soil texture was not reported for creosote or mesquite systems making it unclear if sandy soils made it easier to consume or damage *S. barbatus* relative to a soil with more silt or clay content or if there is a different mechanism. Several ecological sites in the analysis area have sandy soils including limy fans, sandy bottoms, and the sandy loams. It is possible grazing could result in reduced density of *Schismus.* Additional information on grazing and its effects on annual grasses is included in the SDNM Grazing RMPA EA (BLM 2024, section 3.6.2, pages 26-30). It is also worth noting that native herbivores also contribute to the spread of invasive species through preferring to eat native plants, clearing the way for the front of nonnative plant invasions, and curtailing restoration efforts. (Orrock et al 2008, 2009, 2010).

Climate change has increased temperatures and altered the timing of precipitation in ways that may have benefited invasive species (Abatzoglou and Kolden 2011). Climate change is expected to cause an expansion of suitable habitat for Sahara Mustard (*Brassica tournefortii*) (Curtis and Bradley 2015). A number of natural environmental variables influence *B. tournefortii* populations including, aspect, soils, distance from washes, precipitation, and vegetation type (Sanchez-Flores 2007, Berry 2014, Rahmani 2020). *B. tournefortii* density is typically greatest within 500 m of roads (Sanchez-Flores 2007), but the trend can continue out to 2000 m before leveling off (Berry 2014). Despite research conducted in grazing allotments, proximity to grazing infrastructure did not change the likelihood of *B. tournefortii* presence (Berry 2014). Cattle and wildlife do not consume *B. tournefortii* (Renz 2006). However, overgrazing would open suitable habitat for the species to establish. Potential allelopathic effects of *B. tournefortii* on native species was studied using *Chaenactis stevioides* and *Plantago ovata. Plantago ovata* biomass increased when exposed to soils with assays of chemicals from *B. tournefortii* and negated the inverse relationship between the biomass of the two natives allowing *P. ovata* to persist despite the increase in *C. stevioides* biomass at the time of introduction (Underwood 2014).

Oncosiphon piluliferum is an invasive species quickly establishing throughout southern Arizona (Hendrick 2020). The species is likely unpalatable for livestock (Douglas 2022) and quickly establishes on disturbed areas in part because a single plant can produce 5000 seeds (Hendrick 2020). Seeds can remain viable in the soil seed bank for a minimum of 3 years, and likely longer (Douglass 2022). Over grazing contributed to a 10-fold greater canopy cover of *O. piluliferum* than in sites with low utilization (Rutherford 2010).

Alternative A: No Action

Arnold

Desirable Resource Conditions (Standard 3) met management objectives for the Granitic Upland and Limy Upland sites in the north and center of the allotment (Figure 4). The sites in the southern portion of the allotment did not meet objectives for perennial species composition and bare ground and, to a lesser extent, perennial species diversity (Figure 4). The lack of palatable perennial species makes this allotment not suitable for perennial grazing. Ephemeral grazing may still be plausible as annual species, particularly *Plantago ovata* (Indian wheat), were plentiful. However, the existing Terms and Conditions do not constrain ephemeral grazing to the extent that Alterative B and C do. There would be more plant matter removed which may increase bare ground which may benefit invasive species establishment. Relative to the other alternatives, the No Action Alternative would increase the stress to plants making native species less competitive against invasive species. Since this alternative has the fewest constraints on continued grazing, this alternative has an increased risk of the spread of invasive species from

overgrazing relative to the other alternatives. However, as overgrazing is less likely with ephemeral grazing than perennial grazing, the risk is relatively low.

Beloat

Given evidence of ecological degradation in the monitoring, continuing to graze at current levels would likely contribute to further degradation of land health conditions in the allotment particularly in the Southeast, West, and Estrella pastures which show evidence of declining range health, palatable perennial plant composition, and ecological function.

Based on the AIM data collected in 2022 and 2023, *Schismus* is found in the SDNM (or Southwest), West, and Southeast pastures including at sites in the SDNM. *Brassica tournefortii* was located in the SDNM (SW pasture) and *Oncosiphon piluliferum* was not located in the AIM data, but iNaturalist suggests *Schismus* (iNaturalist 2025c)*, O. piluliferum* (iNaturalist 2025b)*, and B. tournefortii* (iNaturalist 2025a) are established in the Estrella Mountain Regional Park, suburban area, and farmlands in the Northwest and West pasture and may serve as a seed source for invasive plants.

Current and historic grazing management has led to the Southeast Pasture not meeting desirable resource objectives for bare ground, perennial plant species diversity and palatable species (Figure 5). Though potentially associated with a combination of recreational use and historic grazing management, the West Pasture is also not meeting desirable resource conditions (Grazing Standard 3) in two of three sites (Figure 5). Both of the sites exceed expectations for bare ground cover, two have less than expected foliar cover and the proportion of palatable species did not meet expectations at one site. The bare ground in the West and Southeast Pastures increase the risk of further expansion of invasive species populations. There would be more plant matter removed which may increase bare ground which may benefit invasive species establishment. Relative to the other alternatives, the No Action Alternative would increase the stress to plants making native species less competitive against invasive species. This Alternative A would increase the risk of invasive species spreading in the Beloat Allotment relative to the Resource Protection and Ephemeral Grazing Alternatives.

Alternative B: Resource Protection

Arnold

Desirable Resource Conditions (Standard 3) were generally suitable for the Granitic Upland and Limy Upland sites in the north and center of the allotment (Figure 4). The sites in the southern portion of the allotment did not meet objectives for perennial species composition and bare ground and, to a lesser extent, perennial species diversity (Figure 4). This allotment does not appear to be suitable for perennial grazing. Ephemeral grazing may still be plausible as annual species, particularly *Plantago ovata* (Indian wheat), were plentiful. The proposed Terms and Conditions would constrain ephemeral grazing by allowing it to occur only in years when precipitation is at 90% of the year-to-date average by limiting the amount of forage for cattle consumption to 40%. This limitation reduces the risk of overgrazing relative to Alternative A and is the same as Alternative C.

Beloat

Alternative B reduces the number of Active (perennial) AUMs by 84.9% relative to current grazing management (Alternative A). Research suggests setting stocking rates to achieve 30-40% utilization should allow for continued improvement of rangeland health in desert rangelands (Holechek et al. 1999, Holechek et al. 2006). As a result, reducing the AUMs in the Estrella, Southeast, and West, Pastures to zero in below average rain and at a maximum of 40% meets the overall goal of maintaining an overall average below 35%. Managing those pastures under ephemeral grazing would allow perennial plant communities to recruit and recover and make progress towards the achievement of land health standards. Setting a cap of 35% utilization on forage in the perennial pastures is expected to allow for the perennial pastures in the eastern portion of the allotment to make progress toward achieving rangeland health objectives.

The 2024 SDNM Grazing RMPA (BLM 2024a) constrains grazing in the SDNM to ephemeral grazing. The grazing management in the Alternative would be ephemeral in the SDNM (Southwest) Pasture and conform to the 2024 RMPA (BLM 2024a). Ephemeral grazing would only occur when precipitation is at 90% of the year-to-date average and cattle would be limited to 40% of the ephemeral forage in the pasture. In years of greater than average rain, ephemeral grazing in the allotment except the Northwest

pasture would help to control fuels levels. The reduction in perennial grazing in pastures not meeting Standard 3 would allow plant communities to recover. Improved plant communities would increase root biomass protecting soils and increase canopy cover reducing the force of impact of rains and allowing for better soil retention.

Alternative C: Ephemeral Grazing

Arnold

Desirable Resource Conditions (Standard 3) were generally suitable for the Granitic Upland and Limy Upland sites in the north and center of the allotment (Figure 4). The sites in the southern portion of the allotment did not meet objectives for perennial species composition and bare ground and, to a lesser extent, perennial species diversity (Figure 4). This allotment does not appear to be suitable for perennial grazing. Ephemeral grazing may still be plausible as annual species, particularly *Plantago ovata* (Indian wheat), were plentiful. The proposed Terms and Conditions would constrain ephemeral grazing by allowing it to occur only in years when precipitation is at 90% of the year-to-date average and by limiting the amount of forage for cattle consumption to 40%. This reduces the risk of overgrazing relative to Alternative A and is the same as Alternative B.

Beloat

Alternative C eliminates all Active AUMs authorized under the current grazing management (Alternative A) converting the entire allotment to ephemeral only. Research suggests setting stocking rates that achieve 30% - 40% utilization should allow for continued improvement of rangeland health in desert rangelands (Holechek et al. 1999, Holechek et al. 2006). Ephemeral grazing in all pastures would occur only when precipitation is at or above 90% of the expected year-to-date average and limits cattle consumption of palatable forage to 40%. In review of the last 20 years of precipitation data, the average precipitation is lower than 90% of normal average between 30%-47% of the time, depending on the weather station and pasture in question (Maricopa 2025, see Table 15 for weather stations). This suggests grazing may occur in 5 to 7 years of the 10-year permit. In years of greater than average rain, ephemeral grazing would help to control fuels levels. The reduction in grazing pressure in Estrella, Southeast, West, and SDNM (Southwest) Pastures, would permit plant communities to recruit, recover, and restore degraded ecological function and diversity. Improved plant communities would increase root biomass protecting soils and increase canopy cover reducing the force of impact of rains and allowing for better soil retention.

Ephemeral grazing controls the buildup of fuels from annual grasses and forbs mitigating the risk of wildfire. *Schismus* increases the likelihood of wildfires in the desert southwest (Fusco et al. 2019), but livestock grazing has the potential to reduce fine fuels load and continuity (Davies et al. 2010, Davies et al. 2015) contributing to smaller burned areas when fires occur. Winter grazing lowered the maximum fire temperature, decreasing the risk of fire induced plant mortality in the sagebrush steppe (Davies et al. 2015). Cattle remove fine fuel biomass and reduce herbaceous litter resulting in shorter flame lengths and slower rates of spread (Diamond et al. 2012, Bruegger et al. 2016, Schachtschneider et al. 2024) even when utilization is as low as 26% (Bruegger et al. 2016). Moderate grazing prior to a fire can result in significantly lower cheatgrass cover relative to ungrazed sites (Davies et al. 2016). Sites grazed prior to fire had significantly greater native grass biomass, cover, and density and greater biotic crust cover than ungrazed sites 20 years after a fire (Davies et al. 2016).

This alternative would likely allow the pastures that are failing to meet rangeland health standards to make progress toward meeting those standards.

Alternative D: No Grazing

Removing cattle from an area with a long grazing history can increase invasive grass cover and reduced native grass cover (Porensky et al. 2020). Removing cattle grazing led to an increase in *Bromus rubens* cover (Brooks et al. 2006b) and other *Bromus* species (Brooks et al. 2016). Since the impact of grazing on *Schismus* is dependent on soils, *Schismus* may increase or decrease locally (Sassie et al. 2009) in the absence of grazing. *Schismus* is present in the allotment and increases the likelihood of wildfires in the desert southwest (Fusco et al. 2019), and in the absence of livestock grazing, fine fuels loads, and continuity may increase (Davies et al. 2010, Davies et al. 2015) contributing to larger burned areas when fires occur. A lack of winter grazing may result in hotter fires and greater rates of plant mortality (Davies et

al. 2015). In the absence of cattle consuming fine fuel biomass and reducing herbaceous litter, flame lengths and the rates of fire spread can increase (Diamond et al. 2012, Bruegger et al. 2016, Schachtschneider et al. 2024).

Arnold

The No Grazing Alternative would result in the greatest risk of wildfire. Removing grazing from the allotment would allow fuels to build up over time. There is also a risk of fuels build up near the roads in the southern portion of the allotment which could result in an accidental fire caused by campers or recreational target shooting. A fire that spreads through portions of the allotment would clear habitat for invasive plants. The area around the corral at the Quarter Corner Well would provide a seed source for *Schismus* and *O. piluliferum* invasion into other parts of the allotment. Removing cattle grazing from the allotment may allow the landscape to make progress toward meeting land health standards but risks fuels building up and resulting in wildfire.

Beloat

Though the removal of grazing is potentially beneficial in some respects, the SDNM and adjoining Pastures have *Schismus* and *B. tournefortii.* These species create a buildup of continuous fuels that would promote the spread of fire. There is also a risk of fuels build up near the roads in the southern portion of the allotment which could result in an accidental fire caused by campers or recreational target shooting. A fire that spreads through portions of the allotment would clear habitat for invasive plants. Removing cattle grazing from the allotment may allow the landscape to make progress toward meeting land health standards but risks fuels building up and the associated potential for wildfire.

3.4 Will the Proposed Grazing Management Degrade Cultural Resources?

3.4.1 Affected Environment—Cultural Resources

Cultural resources are the physical remains of human use and occupation observed on the land. Cultural resources are considered non-renewable, meaning they cannot be reclaimed or repaired if lost or damaged. Cultural resources can include pre-contact and historic sites, districts, buildings, structures, objects, cultural landscapes, sacred sites, and Traditional Cultural Properties. Within the broad range of cultural resources are Historic Properties, which are those that have recognized significance and are considered eligible for inclusion in the National Register of Historic Places (NRHP). There are 141 previous projects or undertakings within the analysis area where professional archaeologists conducted pedestrian surveys, 46 within the Arnold allotment and 95 within the Beloat allotment. The BLM Arizona cultural heritage program conducted 58 of those surveys and the rest were conducted by private-sector archaeological firms. All but three surveys were conducted in support of consultation under Section 106 of the National Historic Preservation Act (NHPA) or of state requirements under the Arizona Antiquities Act; the other three surveys were conducted by or on behalf of the BLM's cultural heritage program under Section 110 of the NHPA.

The surveys were conducted in support of a broad range of activities generally related to communications, transportation, energy generation and transmission, recreation, and public works infrastructure. Multi-jurisdictional surveys were conducted primarily for energy-related infrastructure such as the Palo Verde to Kyrene 500-kV (kilovolt), Hassayampa to Jojoba 500-kV, and Palo Verde to Pinal West 500-kV transmission lines, in addition to numerous smaller 230- and 69-kV transmission lines, interconnects, switchyards, and substations. Other multi-jurisdictional surveys were conducted for projects such as the El Paso Natural Gas Pipeline, All-American Pipeline, and Transwestern Pipelines. On state and private lands, surveys were conducted for access roads, subdivision development, buried telephone lines, Arizona geological surveys, sewar lines, aggregate mines, and civil engineering projects like regional landfills, the Rainbow Valley drainage masterplan, and other water catchments.

Specific to the BLM-administered lands, surveys were conducted for proposed Renewable Energy Development Areas, rights-of-ways to provide access to private in-holdings, for State Route 85, and in areas where recreation and off-road motorized use is common. Most importantly and pertinent to this undertaking, surveys were conducted at all the constructed range infrastructure within the Arnold and

Beloat Allotments on the BLM-administered lands, including dirt tanks such as the Montezuma tank waterhole, Rainbow Valley well, drinkers, fence lines, and cattle guards. These surveys were conducted to ensure that no historic properties were present in areas where cattle congregate, or where cattle trailing occurs along fence lines.

Archaeological survey coverage, as depicted in Figure 3 on page 9 of the Class I inventory completed for this undertaking, is evenly distributed throughout the APE, although some of the coverage comes from older surveys dating to the 1960s, 1970s, and early 1980s. The APE totals 169,766 acres of which 28,579 acres were surveyed for archaeological resources: 13,575 acres on the BLM-administered, 9,024 acres on private, 1,369 acres on ASLD, 204 acres on U.S. Fish and Wildlife Service-managed, and 97 acres on Indian trust (Gila River Indian Community) lands.

Archaeological site density, as depicted in Figure 4 on page 14 of the Class I inventory is considered low given the even distribution of survey coverage. The previous archaeological surveys documented 235 sites, 57 of which are eligible for inclusion in the NRHP, 87 of which are not eligible for inclusion in the NRHP, 88 of which have no final eligibility determination, and 3 of which were not relocated by the previous investigations and appear to be misplotted or not formally recorded. Specific information such as site number, age, cultural affiliation, NRHP status, location—including both universal transverse Mercator and public lands survey system—and short description are in Appendix D – Arnold Resources and Appendix E – Beloat Resources.

The presence of several trail segments warrants a landscape approach to understanding cultural and NRHP eligibility, both precontact and in historic time periods. There are at least three sites that qualify as Traditional Cultural Properties, pending additional tribal consultation. In addition, the presence of occupational sites, village sites, pithouses, and sites that contain the triad of lithic artifacts, ceramic artifacts, and groundstone artifacts, suggest that human remains and associated funerary objects are probable at those locations. Most of the sites recorded in the 1960s to early 1980s need updated recordings to assess current condition and perform re-evaluations for NRHP eligibility to include tribal perspectives and indigenous knowledge.

This undertaking does not authorize the construction of any new access roads or new range improvement infrastructure such as fences and corrals, cattleguards, wells, waterlines, or water facilities, but it may authorize continued livestock grazing. The three action alternatives will result in a reduction of livestock grazing, a reduction of livestock grazing based on precipitation and ground forage, or the elimination of livestock grazing, respectively. All three action alternatives reduce the potential for direct and indirect effects on cultural resources within the analysis area.

The existing range infrastructure was subject to class III archaeological surveys prior to construction and installation of the facilities to ensure no historic properties were present. To ensure no adverse effects occur, the BLM is following the minimization measures in Appendix G: Range Management Protocol of the Programmatic Agreement (PA) among the Bureau of Land Management, Southwestern Region Three of the U.S. Forest Service, U.S. Fish and Wildlife Service, Arizona State Historic Preservation Officer, and Advisory Council on Historic Preservation regarding the Effects of Vegetation and Range Management Activities in Arizona, executed September 30, 2020 (BLM 2020b). The cultural resources within the analysis area are predominantly attributed to Ancestral O'odham, Patayan and River Yuman groups, historic period O'odham and Pee Posh, Black American homesteading, and historic ranching. Figure 4 shows the density and distribution for all site types within the Arnold and Beloat Allotments and the APE.

The previous investigations were assessed for conformance with SHPO Guidance Point Number Five – *Relying on Old Archaeological Survey Data*. There are 66 previous surveys that were conducted in the 1960s, 1970s, and early 1980s meaning that the transect width are greater than the 20-meters required by today's standards. These older surveys also reflect a different era in cultural resource management theory and practice when compared to the present. Evaluations of NRHP eligibility in the 1960s, 1970s, and early 1980s did not consider tribal perspectives when applying the NRHP criteria. Petroglyphs, trails, rock rings and rock alignments were frequently only evaluated under Criterion D for their potential to yield important information to history or prehistory. However, cultural resource practitioners would now evaluate these types of archaeological sites under Criteria A, B, and C, ideally in consultation with Indian Tribes; newer recording technology and techniques and tribal consultation may result in more accurate

recordings and interpretation of these sites. While these older investigations should not be relied on for undertakings that authorize new ground disturbance, they do contribute to our understanding of the nature, density, and distribution of cultural resources within the APE. Seventy-five previous archaeological surveys, conducted in the late 1980s or later, meet modern standards in terms of transect intervals. In addition, archaeologists conducted 49 surveys in 2000 or later when cultural resources management theory and practice was similar to today's standards.

There are 92 cultural resource sites within the analysis area—28 in the Arnold allotment and 64 in the Beloat allotment—that can contribute to and be evaluated within the Ancestral O'odham cultural context. Ancestral O'odham sites represent 39% of the total documented cultural resources within the APE, which is to be expected given the proximity to the middle Gila valley.[1]

Many of these sites contain identifiable ceramics that are attributed to Ancestral O'odham spanning the entire cultural sequence from A.D. 200 to A.D. 1450. There are numerous non-diagnostic lithic artifact scatters and features that are likely to be associated with either ancestral O'odham or historic O'odham and Pee Posh given the substantial presence of resources attributed to those cultural contexts within the analysis area. Sites within the analysis area also contain numerous trail segments, canals and canal segments, petroglyph panels, rock features, fire cracked rock concentrations, stone circles, groundstone, middens, bedrock mortars, earthen depressions, and possible pithouses. There are notable ancestral O'odham sites within the analysis area such as site AZ T:16:45 (ASM) which is described as a "Hohokam ceremonial site with petroglyphs in a canyon on a cliff," site AZ T:10:228 (ASM) which is described as containing an "extensive artifact concentration, residential locus, and possibly a village site given its location along the Gila River terrace," and site AZ T:10:74 (ASM) described as an extensive habitation site. These sites are noted here because consultation with Ak Chin Indian Community, Gila River Indian Community, the Salt River Pima-Maricopa Indian Community, and the Tohono O'odham Nation suggest they may qualify as Traditional Cultural Properties.

There are eight previously recorded cultural resource sites that are attributed to Patayan and Colorado river groups within the analysis area—five in the Arnold allotment and three in the Beloat allotment. Patayan and Colorado river group sites represent 3.4% of the total documented cultural resources within the analysis area. Cultural resource sites with a Patayan and Yuman cultural context consist of ceramic and lithic artifact scatters, petroglyphs, fire-cracked rock concentrations, non-thermal rock concentrations, rock alignments, possible temporary camps, and trail segments. There are several artifact scatters attributed to unknown Native American cultures (per the ASM site recording manual) that may also be associated with Patayan and River Yuman cultural groups. In addition, there is a site recorded as unknown Native American provenience, site AZ T:10:61(ASM), that contains stone circles. Stone circles, while present in O'odham cultural contexts, are also prevalent in Arizona's western desert and could be associated with Patayan and river Yumans. There is also a small, stocked rock feature, recorded as site AZ T:10:28(ASM), that may be a shrine but was misidentified by archaeologists as a cairn. These stone circles and shrine are noted here because consultation with federally recognized Indian tribes along the river suggest that they are sacred. Overall, sites within the analysis area attributed to the Patayan and River Yuman cultural groups are indicative of their long-distance travel, as evidenced by the presence of trail segments, temporary camps, non-residential artifact scatters, rock rings, and a possible shrine.

There are two sites within the analysis area where the recording archaeologists attributed the cultural affiliation to Historic period O'odham and Pee Posh—one in the Arnold allotment and one on the Beloat allotment. AZ T:16:124 (ASM) is a trail segment of the Quartz Peak trail, which spans ancestral O'odham and historic period Akimel O'odham, qualifies as a Traditional Cultural Property. The other site, AZ T:10:28 (ASU), is attributed to O'odham and described as "rock platforms." In addition, there are numerous artifacts scatters with unknown Native American cultural affiliation, and another site with no cultural affiliation or temporal age association, site AZ T:10:47 (ASM), that may be historic period O'odham and Pee Posh based off the description as a "ramada with cobble outline and saguaro rib frame." This site description is reminiscent of the reconstructed ramada located at the Salt River Pima-

[1] Please note that the cultural affiliation and temporal ages listed in the tables conform to the site recording manual developed by the Arizona State Museum, so Hohokam is still used.

Maricopa Indian Community Tribal Historic Preservation Office. Given the predominance of ancestral O'odham sites in the analysis area and given the proximity to the current Gila River and Ak Chin Indian Communities, it is likely that many of the cultural sites with unknown cultural or temporal affiliations can be attributed to historic use by the O'odham and Pee Posh.

There are two sites within the analysis area attributed to Black American Homesteading—one in the Arnold allotment and one in the Beloat allotment. Site AZ T:15:60 (ASM) in the Beloat allotment is a historic period artifact scatter with one structural component. Site AZ T:10:241 (ASM) in the Arnold allotment is historic period habitation associated with East Allenville, a subdivision of Maricopa County that was platted in 1945 by Mr. L.S. Norton. There are numerous artifact scatters and features within the APE attributed to Euro-American cultural affiliation that may actually be attributed to Black American use of the area in and around Mobile and East Allenville. Absent specific land plats or structural components, attributing ethnic affiliation to historic artifact scatters in the analysis area is difficult. Both Black Americans and Euro-Americans are known to have inhabited the area.

Site AZ T:11:32 (ASM) within the Beloat allotment is the most notable ranching site in the APE, containing historic-period artifact scatter, a well, concrete foundations, corrals, and a loading chute. Another site, AZ T:11:66 (ASM), consists of a large homestead or work-related camp that contains a trash mound, several accumulations of auto parts and construction materials, a rock alignment, a well head, and hundreds of cans, fragments of wood, metal, and glass. However, this site no longer retains integrity of design, association, feeling, or workmanship, and is therefore not eligible for inclusion in the NRHP. Many of the historic period ranching sites within the analysis area consist of historic period artifact scatters and dilapidated grazing infrastructure such as well heads, corrals, and fencing.

There are numerous sites within the analysis area that do not fit nicely within the historic and cultural contexts developed for this Class I inventory but could have been associated with historic period use of the area. These site types include historic road segments, irrigation ditches, collapsed historic structures, older/outdated transmission lines, historic prospecting pits, trash dumps, and, in one case, an artifact scatter representing a military cargo plane crash from the mid-1960s from Luke Air Force Base, considered not eligible for inclusion in the NRHP.

3.4.2 Environmental Impact

There are several consequences of grazing that have the potential to impact archaeological sites. First, archaeological sites are affected by the direct effects of livestock, including crushing and displacement of artifacts, chiseling in damp soils, and sloughing and collapse of streambanks. This is a concern in the arid southwest, where both archaeological sites and areas of cattle congregation have a high association with sources of water. In addition to water sources, cattle aggregation could occur at locations with salt or mineral licks, gates between pastures, and areas with shade. Second, archaeological sites are affected by indirect effects from livestock grazing, including removal or partial removal of vegetation, or biomass reduction which can lead to erosion, streambank destabilization, and downslope transport of artifacts. Other possible indirect effects are a close link between the reduction of vegetation through grazing and the incidence of artifact collection. Effects from grazing to archaeological sites are largely a product of the length of time and intensity that a site is subjected to those direct and indirect effects (Horne and McFarland 1993).

Through active range management, effects can be mitigated to minor or moderate. Mitigation measures from the 2020 PA that would apply under any of the alternatives (except the No Grazing alternative, for which it would not be relevant) include, but are not limited to, fencing or exclosures of livestock from individual sensitive cultural resources or areas containing multiple sensitive cultural resources, relocation of existing range management facilities and salting locations enough to ensure the protection of cultural resources, relocation or redesign of proposed range management activities and ground disturbing management practices to avoid direct and indirect effects to cultural resources. Existing range infrastructure was subject to class III archaeological surveys prior to construction and installation of the facilities to ensure no historic properties were present. To ensure no adverse effects occur, the BLM is following the minimization measures in Appendix G: Range Management Protocol (BLM 2020b).

Periodic monitoring to assess site conditions and ensure mitigation measures are effective, is consistent with methodology in cultural resource protection and the field of archaeology to prevent damage from natural causes, human activities, and unforeseen events ensuring the integrity of the resources. Regular visits to the site are crucial to document changes over time. Archaeologists inspect sites for signs of deterioration or damage and after extreme weather events to assess and record damage. Monitoring allows for timely detection of deterioration or damage caused by natural elements, human activities, or looting. When sites are damaged, important information about past lifeways is lost because the evidence is finite. Documenting changes over time helps archaeologists inform and implement effective conservation strategies, preventing that loss of information. Monitoring is also crucial for safeguarding archaeological sites for future research and enjoyment. Any new range improvements (which would be considered and approved, if at all, through a separate decision process) would be subject to the requirements of the PA to comply with Section 106 of the NHPA (BLM 2020b).

Additional information on the impact of grazing to cultural resources is described in the 2024 SDNM Livestock Grazing RMPA EA (DOI-BLM-AZ-P040-2024-0001-RMP-EA) in sections 3.9 and 4.11 (pp 41-45, 69-71).

Alternative A- No Action Alternative

Arnold and Beloat Allotments

Under the No Action Alternative, the environmental consequences described in section 3.4.2 remain unchanged because the permits would be renewed for a period of ten years under the same terms and conditions. The No Action Alternative poses the greatest potential for environmental consequences to cultural resources because it would authorize 2,859 AUMs, more than any of the other alternatives.

Alternative B- Resource Protection Alternative

Arnold and Beloat Allotments

Under the Resource Protection Alternative, the environmental consequences described in section 3.4.2 would be reduced relative to alternative A because this alternative authorizes 433 active AUMs and places 1127 AUMs in suspense contingent on precipitation and forage, fewer AUMs than the No Action Alternative. The reduction in AUMs reduces the potential for direct effects such as trampling and displacement of artifacts. The ephemeral grazing terms and conditions would diminish the potential of indirect effects caused by removal of vegetation or reduction in biomass.

Alternative C- Ephemeral Grazing Alternative

Arnold and Beloat Allotments

Under the Ephemeral Grazing Alternative, the environmental consequences described in section 3.4.2 would be reduced to a greater extent than under Alternative B. Under the Ephemeral Grazing Alternative, there would be no perennial AUMs, and the terms and conditions of ephemeral grazing would require sufficient precipitation and forage before the BLM would approve grazing. This could result in seasonal reduced impacts or years where grazing was not approved at all due to broader weather patterns like El Niño or La Niña, thereby reducing the potential for impacts to cultural resources.

Alternative D- No Grazing Alternative

Arnold and Beloat Allotments

Under the No Grazing Alternative livestock grazing would not be authorized under any conditions on the BLM-administered lands within the Allotments thereby eliminating the potential for direct or indirect effects. Grazing and associated impacts to cultural resources could still occur on State and Private lands. Several federally recognized Indian Tribes have expressed support for the No Grazing Alternative.

3.5 How Will The Proposed Grazing Management Impact Habitat For Wildlife, Migratory Birds, BLM Sensitive Species, and Threatened and Endangered Species, Based on the Habitat Requirements?

3.5.1 Affected Environment—General Wildlife, BLM Sensitive Species, Threatened and Endangered Species, and Migratory Birds.

3.5.1.1 General Wildlife

The analysis area contains many species of animals that are commonly associated with a Sonoran desert scrub community. Larger general wildlife species include desert mule deer (*Odocoileus hemionus*), javelina (*Pecari tajacu*), mountain lion (*Puma concolor*), and bighorn sheep (*Ovis canadensis*). Medium sized mammal species present include the black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), skunks (*Mephitis* spp.), coyote (*Canis latrans*), American badger (*Taxidea taxus*), and raccoon (*Procyon lotor*). Additional wildlife species present within the analysis area include bats, small mammals, reptiles, amphibians, and various migratory birds. These include cave myotis (*Myotis velifer*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), western diamondback rattlesnake (*Crotalus atrox*), Sonoran gopher snake (*Pituophis catenifer affinis*), red backed whiptail and other whiptail lizards (*Aspidoscelis xanthonata, Aspidoscelis* spp.), horned lizards (*Phrynosoma* spp.), zebra-tailed lizard (*Callisaurus draconoides*), side blotched lizard (*Uta stansburiana*), elf owl (*Micrathene whitneyi*), western screech owl (*Megascops kennicottii*), and peregrine falcon (*Falco peregrinus anatum*). Habitat requirements for wildlife species vary, but the potential impacts from the proposed action would affect many species in a similar manner so those effects will be analyzed together. For more information on general wildlife that may occur within the analysis area, see Section 3.2.13 of the Lower Sonoran/SDNM FEIS (BLM 2012b, pp3-52:3-66). The BLM does not authorize or undertake predator control. Any predator control measures would need to be authorized under AZGFD 17-302 in the Arizona Game and Fish Laws and Rules August 2024 edition (AGFD 2024).

Large game species such as the desert bighorn sheep and deer occur within the analysis area. Desert bighorn sheep habitat could potentially be affected by livestock grazing. Bighorn sheep prefer steep slopes and are most likely to occur within the Maricopa Mountains and Estrella Mountains. Within the analysis area, AZGFD has developed water catchments for desert bighorn sheep and deer. There are four water catchments located within the analysis area and an additional seven water catchments located within 5 miles of the analysis area. The positions of these water catchments in steep rugged mountains and the comparatively flat terrain associated with the potential livestock water locations, are expected to reduce the possibility of wildlife-livestock interaction at waters and reduce the potential for the spread of disease. Interaction between livestock and wildlife presents a risk of transmission of bovine tuberculosis (bTB) caused by *Mycobacterium bovis*, cervid tuberculosis (cTB), brucellosis, epizootic hemorrhagic disease (HD), and bluetongue (BT). There is limited evidence of the presence of these diseases within Arizona. Livestock waters, livestock feeds, grazing, and other factors pose a risk of disease transmission between cattle and wildlife in southern U.S. regions (e.g. Arizona). Various studies have shown bTB infected cattle to be frequently identified within dairy or slaughter operations in Mexico (USAHA 2005; USAHA 2023; Portacci et al. 2010), and have described the probable presence of bTB "in free-ranging deer in northern Mexico" (Miller et al. 2013). Both tuberculosis and brucellosis have an insignificant presence in Arizona. As closely related viruses, HD and BT also are not of significant concern for cattle in Arizona since they do not have significant prevalence in Arizona ungulates. This is due to the arid Sonoran Desert habitat, which generally lacks appropriate breeding sites for *Culicoides* spp. midges, the main vector of BT viruses (Noon et al. 2002). The naturally arid climate of the Sonoran Desert contributes to the lowered transmission of other concerning diseases as well. In the case of interactions between Sonoran pronghorn and livestock, the BLM has previously observed "[M]any of the potential conflicts… are not well known or understood. Livestock may compete with Sonoran pronghorn for preferred thermal cover. In other areas, livestock have been reported to displace pronghorn does from fawning areas. There is the possibility of disease (e.g., epizootic hemorrhagic disease, bluetongue) transmission from livestock to Sonoran pronghorn" (BLM 2022b). Since the possibility of wildlife-related disease transmission to livestock remains, there are prevention and mitigation measures that have been and can

be implemented, with the "most successful tools…[involving] fencing technology…that reduces contact between wildlife and livestock feed" (Miller et al. 2013).

Livestock grazing may deplete available forage, and the presence of livestock may alter the foraging behavior of big horn sheep and deer. One study found that in areas of cattle use, bighorn sheep adjusted their foraging behavior by increasing travel time in search of areas with adequate forage (Garrison 2015). At least one study has shown that bighorn sheep movement increased as cattle moved towards them, indicating at least some level of avoidance (Bissonette 1996) and another showed increased vigilance in male bighorns in the presence of livestock (Brown et al. 2010). Several studies support the idea that deer will shift their diets and habitat selection to forage and habitats less preferred by livestock (Austin and Urness 1986, Loft et al. 1991). Increased competition for resources over time has been documented to decrease the use of preferred habitat and forage by deer (Loft et al. 1991, Ortega et al. 1997). Although the migratory behavior of many wildlife species has been studied, the effects that the presence of livestock may have on wildlife movement are not well documented (Pozo et al. 2021).

3.5.1.2 BLM Sensitive Species

The BLM Phoenix District sensitive species list (USDI 2017) was reviewed and cross-referenced, by county, with the AZGFD Environmental Review Tool and Heritage Data Management System to narrow the list of potential special status species that occur within the analysis area (Table 14). Special Status Species include the BLM sensitive species and species that are currently listed or proposed for listing as Threatened or Endangered under the Endangered Species Act of 1973. There are several BLM sensitive species that potentially occur within the analysis area including the Sonoran desert tortoise (*Gopherus morafkai*), lowland leopard frog (*Rana yavapaiensis*), Sonoran green toad *(Anaxyrus retiformis*), western burrowing owl (*Athene cunicularia hypugaea*), bald eagle (*Haliaeetus leucocephalus*), and California leaf-nosed bat (*Macrotus californicus*). Sonoran desert tortoise (SDT) and lowland leopard frogs have been observed within the analysis area. Sonoran green toads, western burrowing owls, bald eagles, and California leaf-nosed bats are not known to occur within the analysis area but the analysis area falls within the Arizona Statewide Action Plan (SWAP) Predicted Ranges, developed by AZGFD, for all four species.

Sonoran Desert Tortoise

SDT occur primarily on rocky, steep slopes, incised washes, and bajadas of the Sonoran Desert. Intermountain valleys and desert washes may be important for juvenile dispersal. Adequate shelter is one of the most important habitat features and tortoises show strong shelter site fidelity (AGFD 2022c). They require loose soil in which to excavate shelters beneath rocks, boulders, or vegetation on semi-open slopes, and within caliche caves of washes. They may also use existing structures such as caliche caves, crevices between rocks and boulders, and spaces under woodrat middens. SDT will consume a wide variety of plant species as well as bones, stones, soil, and mineral deposits for additional nutrient and mineral supplements, mechanical assistance in griding consumed material, and to expel parasites from the intestinal tract (AGFD 2022c).

To address its management responsibilities, the BLM has developed a management plan for SDT on public lands and a strategy for carrying out the plan in Arizona called the Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona: A Range wide Plan (USDI BLM 1990). The analysis area contains habitat that the BLM characterizes as tortoise habitat. Category I desert tortoise habitat includes habitat that is necessary to maintain populations with the highest densities, which are stable or increasing, and which experience the fewest conflicts with current land uses. Category II habitats support stable populations and are contiguous areas with medium to high-density habitat. Category III habitats are the least manageable and contain medium to subpar habitats; however, these areas do exist among Category I and II habitats and should be managed for dispersal among Category I and II habitats. The goal of the BLM is to maintain stable and viable populations with no net loss of habitat in Category I and II areas and to limit population declines to the extent possible in Category III habitats by mitigating impacts. There are approximately 1,760 acres of Category I and 5,339 acres of Category III tortoise habitat within the Arnold allotment, and 19,625 acres of Category I, 35,667 acres of Category II, and 6,293 acres of Category III tortoise habitat within the Beloat allotment (Figure 6). For more information on SDT within the analysis area, see Section 3.2.13 of the Lower Sonoran/SDNM FEIS (BLM 2012b, pp3-52:3-66).

Ephemeral grazing in Arizona is guided by regulations in 43 CFR 4100 (2005), 2023 Arizona Permanent Instruction Memorandum Processing Ephemeral Applications and Estimating Ephemeral Production, and, where designated SDT habitat is present, the 2015 Sonoran desert tortoise Candidate Conservation Agreement (CCA) (USFWS and AIDTT 2015) and Compensation for the Desert Tortoise (MOG, 1991). In desert tortoise habitat, ephemeral grazing may also be guided by recommendations by the Arizona Interagency Desert Tortoise Team (AIDTT). The AIDTT recommends that ephemeral grazing should not be authorized unless the pasture reaches at least 280 lbs./acre of ephemeral forage and utilization of annual forage should not exceed 50%. Agency-specific species and habitat conservation actions outlined for the BLM in the CCA for the SDT include "Desired Pant Community, Desired Future Condition, and habitat connectivity objectives that address the habitat needs of the SDT," as well as standard operating procedures that direct the BLM to "[a]void, minimize, or mitigate impacts associated with all BLM authorized activities including...livestock grazing through project design and modifications to allowable uses in order to achieve SDT management objectives" (USFWS and AIDTT, 2015). The BLM believes that the desired plant community objectives (DPCs) (developed using ecological site descriptions and AZ Grazing Standards as described in the Land Health Evaluation (Appendix 1)) are sufficient to maintain no net loss of Category I or II habitat and to limit impacts in Category III habitat, when the objectives are met. The desired plant community objectives include the percentage of palatable species found on site. The list of palatable and key species includes several key forage species for SDT including *Janusia gracilis, Pleuraphis rigida, Muhlenbergia porteri*, and various species in the genera *Aristida, Mirabilis*, and *Sphaeralcea.* The complete list of palatable and key forage species used can be found in Appendix D of the Land Health Evaluation (Appendix 1). Previous grazing authorizations have approved livestock use of ephemeral forage of up to 50% of the calculated available forage. To mitigate for potential impacts to desert tortoise and category habitat, the BLM proposes to limit the approval of ephemeral applications to 40% of available ephemeral forage and limit the utilization of perennial species to 40%, which has been found to maximize livestock forage intake while reserving forage for other uses (USDA, NRCS, 2022, pg. 645-F.53).

No new range improvements, including water developments, are proposed as part of any of the alternatives analyzed in this EA. Existing water developments consist of dirt tanks with natural sloping sides and raised drinking tanks with wildlife escape ramps. The dirt tanks allow for egress of wildlife and are naturally sloped. Entrapment or drowning of tortoises is unlikely as the slopes are gradual and have natural sloping banks. No entrapment or drowning of tortoises is expected in raised drinking tanks as tank walls are of an adequate height as to be inaccessible and do not have rocks or other landscape features that would allow for a tortoise to access or accidentally fall into the tanks. Wildlife escape ramps are also placed within raised drinking tanks to avoid potential entrapment of other wildlife species.

The CCA for SDT states: “The primary threats to SDT in Arizona are habitat destruction, fragmentation, and degradation. Causes of these threats include but are not limited to invasive nonnative plant establishment; an altered fire regime; urbanization and development; human-constructed barriers to movement; off-road vehicle use; and livestock grazing. Because there is little overlap in the habitat shared by livestock and SDT in most areas in Arizona, and because livestock grazing in Arizona is actively managed by land management agencies, livestock grazing is not currently thought to affect populations in Arizona (USFWS and AIDTT 2015).” However, other studies suggest that threats which may cause habitat degradation and increased mortality over broad areas, such as livestock grazing, have the potential to be large contributors to tortoise population declines as compared to distributed threats with higher mortality rates (Tuma et al. 2016). Recent studies have shown that tortoises use intermountain valleys as part of their home ranges and for dispersal (Averill-Murray et al. 2020) and have recorded differences in habitat usage between juveniles and adult tortoises as well as seasonal variations (Sullivan et al. 2016), which may indicate increased areas of overlap between livestock grazing and desert tortoise habitat beyond what is identified in the CCA. While studies on the effects of livestock grazing on desert tortoise habitat have been conducted (Berry 1978, Avery 1998, Kazmaier 2002), the effects on tortoise behavior are not well documented

Lowland Leopard Frog

Lowland leopard frogs inhabit aquatic systems in desert grasslands to pinyon-juniper. They are habitat generalists and will breed in both natural and man-made aquatic systems including rivers, stream pools, earthen cattle tanks, and livestock drinkers. Adults eat arthropods and other invertebrates while larvae

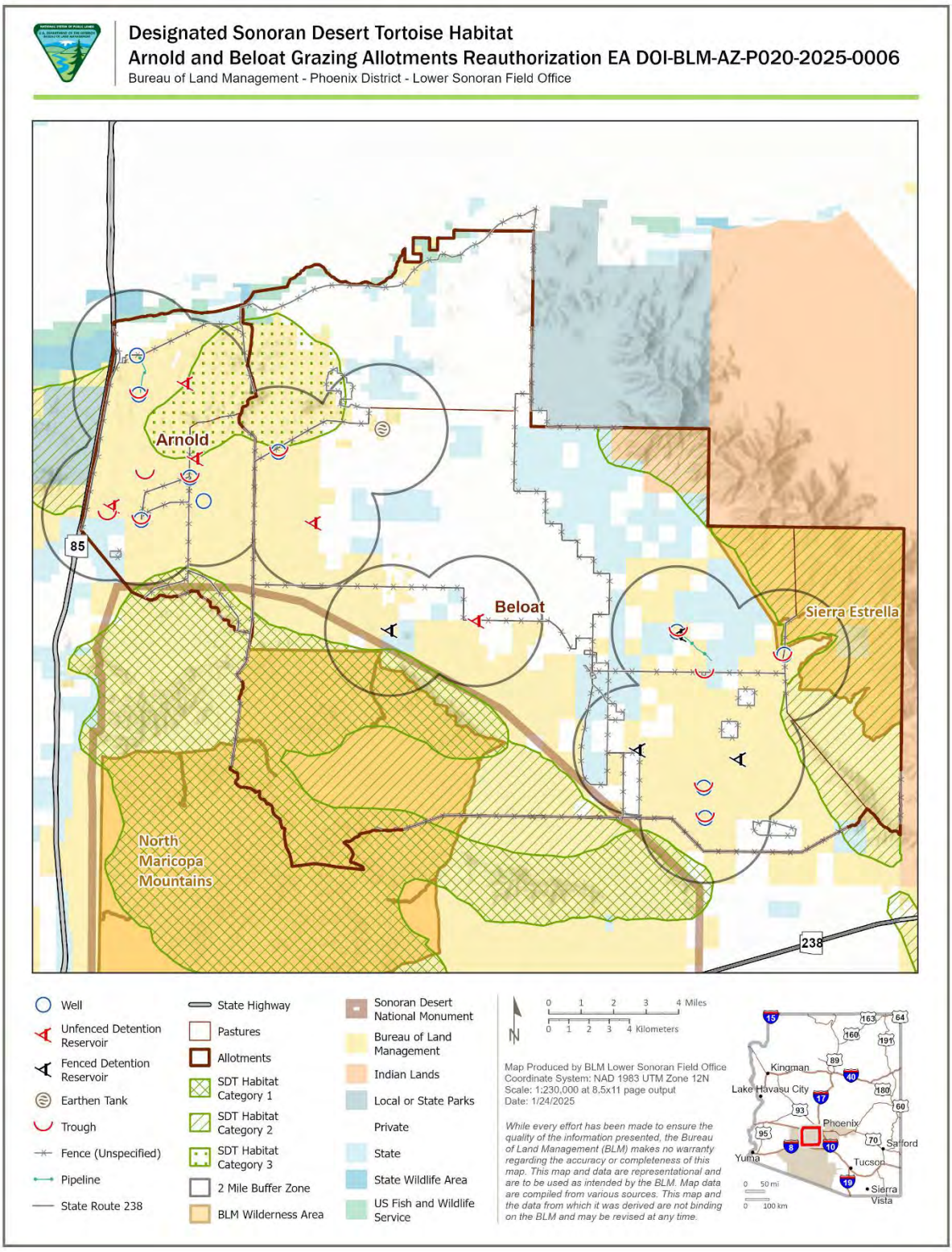

Figure 6 Designated Sonoran desert tortoise habitat in the aAnalysis area. Black circles around livestock waters are 2 mile buffers where cattle are likely to have the greatest impacts (Appendix 5).

Sonoran Green Toad

Sonoran green toads inhabit rain pools, wash bottoms, and areas near water in semi-arid mesquite-grassland, creosote bush desert, and upland saguaro-paloverde desert scrub. They feed primarily on arthropods. The species is secretive and nocturnal and tends to be inactive in both cold temperatures and hot, dry weather (AZGFD 2005).

Western Burrowing Owl

Western burrowing owls occupy a wide variety of open habitats including grasslands, deserts, and open shrubland. Burrowing owls do not dig their own burrows and must rely on existing burrows dug by prairie dogs, ground squirrels, badgers, skunks, coyotes, and foxes but will also use fabricated and other natural openings. Nest-site fidelity is high, and burrows are often reused for several years if not destroyed. Burrowing owls are opportunistic feeders and eat both invertebrates and vertebrates. In Arizona, they feed primarily on large insects and small mammals, as well as fish, reptiles, amphibians, birds, and even prickly pear cactus fruits. Foraging microhabitat typically consists of short grass, in mowed or overgrazed pastures (AZGFD 2022a).

Bald Eagle

Bald eagles inhabit coastal areas, estuaries, unfrozen inland waters, and some arid areas of the western interior and southwestern portion of the U.S. They like areas with high water-to-land edge and unimpeded views, both horizontal and vertical. Breeding habitat in Arizona includes the desert valley surrounding Phoenix, upstream into the lower portions of the canyon country of the Salt and Verde rivers, and coarse-soiled rocky hillsides, talus, and cliffs farther upstream in canyons and on surrounding hillsides. Nesting habitat consists of areas with tall trees, taller than the surroundings, with tree species varying geographically. Their diet in Arizona is comprised mainly of fish, small mammals, carrion, and birds. To a lesser extent, they may also prey on amphibians and reptiles (AZGFD 2011b).

California Leaf-nosed Bat

California leaf-nosed bat usually inhabits the Sonoran desert-scrub. Their primary summer and winter range are essentially the same. They primarily roost in mines, caves, and rock shelters with day roosts in mines typically within 80 feet of the entrance. They prefer roost sites with large areas of ceiling and flying space. They feed primarily on large flying insects such as grasshoppers, moths, and flying beetles. Insect larvae and other flightless daytime active prey may be taken from bushes and off the ground, especially during winter months. They may also feed on fruits, including those of cacti. Foraging typically occurs 1 to 3 hours after sunset and for a 2-hour period that ends approximately one-half hour before sunrise. They do not hibernate and thus feed year-round. The presence of livestock reservoirs in the allotment may attract California Leaf-nosed bats for drinking and foraging opportunities (AZGFD 2014).

3.5.1.3 Threatened and Endangered Species

There are several species that are listed as endangered, or threatened, or identified as candidate species, or are proposed for listing under the Endangered Species Act that may occur within 5 miles of the analysis area including, Sonoran pronghorn (*Antilocapra americana sonoriensis*), cactus ferruginous pygmy owl (*Glaucidium brasilianum cactorum*), yellow-billed cuckoo (C*occyzus americanus*), Yuma Ridgway's rail (*Rallus obsoletus yumanensis*), southwestern willow flycatcher (*Empidonax traillii extimus*), California least tern (*Sternula antillarum browni*), desert pupfish (*Cyprinodon macularius*), Gila topminnow (*Poeciliopsis occidentalis*), and monarch butterfly (*Danus plexippus*). There is not any designated critical habitat within the analysis area.

Of these species, only the monarch butterfly and southwestern willow flycatcher have been observed within the analysis area. A biological assessment (BA) was written (Appendix 4) and informal consultation was initiated with USFWS on December 27, 2024. A Letter of Concurrence was received January 30, 2025, concurring with the BLM's assessment of impacts (Table 14).

Cactus Ferruginous Pygmy Owl

Appropriate habitat exists within the analysis area for cactus ferruginous pygmy owl; however, the species has not been observed within 50 miles of the analysis area in the last 30 years. In the last 30 years, the pygmy-owl has been found only in portions of Pima and Pinal Counties. They may be found in a variety of vegetation communities including Sonoran desert-scrub, thorn-scrub, and semidesert

grasslands. They typically prefer edge habitat and are found in semi-open areas of thorny scrub and woodlands in association with suitable nesting vegetation. Nesting occurs in cavities in trees and columnar cacti, typically saguaros, and breeding season in Arizona is typically September to April. They are generalist predators whose diet includes small reptiles, amphibians, mammals, other birds, and large insects. (AZGFD 2022b)

Yellow-billed Cuckoo

The SWAP predicts approximately 1,928 acres of suitable habitat for yellow-billed cuckoo within the analysis area on the northern portion of the Beloat allotment, bordering the Gila River. The closest observation in the last 10 years was within one mile of the analysis area. In Arizona, they are known to breed primarily within the Bill Williams, Big Sandy, Agua Fria, Verde, Gila, Santa Cruz, and San Pedro river watersheds. They are a riparian obligate species. In the arid southwest, they may utilize desert scrub and desert grassland drainages with a tree component, and intermittent or ephemeral drainages with immediately adjacent upland habitat. Nesting sites are primarily in riparian habitat. They feed on large insects and small vertebrates. (AZGFD 2021b)

Southwestern Willow Flycatcher

There is no mapped suitable habitat for the southwestern willow flycatcher within the analysis area, but the species has been observed in the last 10 years. This flycatcher is a riparian obligate species found throughout the Southwest, where it breeds in dense riparian habitats along rivers, streams, or wetland areas where trees and shrubs are adjacent to or near surface water. In Arizona, they are known to occur primarily along the Gila, San Pedro, and Salt rivers. Nesting sites are primarily in riparian habitat with thick plant growth. They feed on invertebrates including terrestrial and aquatic insect species (AZGFD 2002).

Yuma Ridgway's Rail

The SWAP predicts approximately 14,290 acres of suitable habitat for Yuma Ridgway's rail within the analysis area, located primarily along the northern edge. The closest observation in the last 10 years is within one mile of the analysis area. They prefer dense riparian and marsh vegetation and inhabit freshwater or brackish stream sides and marshlands. Their diet consists primarily of crayfish, freshwater clams, and other invertebrates. (USFWS 2025c)

California Least Tern

There is no mapped suitable habitat for the California least tern within the analysis area. The closest observation was approximately 11 miles northeast of the Analysis area. California least terns nest in both natural and man-made sites that include beaches close to river mouths, estuaries, and coastal embayments. Nesting season is primarily from mid-April to mid-September. They forage near the shore waters, estuaries, and river mouths. Their diet consists primarily of slender-bodied fish such as anchovies and topsmelt. (USFWS 2025d)

Sonoran Pronghorn

Sonoran pronghorn is not known to occur in the analysis areaarea, but the entire analysis area has been designated as habitat for a 'Non-Essential Experimental Population' under section 10(j) of the Endangered Species Act (USFWS 2011) (see Figure 3-15 of the Lower Sonoran/SDNM FEIS, BLM 2012b). Sonoran pronghorn utilize habitat characterized by broad alluvial valleys separated by mountains. Southern populations breed from July to September and typically fawn from January to March. Their diets vary between seasons, with forbs selected when available. They will browse on a wide variety of species including palo verde, mesquite, ironwood, chain fruit cholla, white ratany, spurge, white and triangle-leaf bursage, and wooly plantain. Sonoran pronghorn are adapted to living with low quantities and infrequent access to free water, but are observed utilizing water sources, including livestock waters, when available. (AZGFD 2021a)

Desert Pupfish

There is no mapped suitable habitat for the Desert pupfish within the analysis area but there is a documented observation within 3 miles of the analysis area. This species is an aquatic obligate. They are omnivorous and feed primarily on algae and aquatic invertebrates. (USFWS 2025a)

Table 14 Special Status Species including federally listed threatened and endangered species. Details on the determinations are in the Biological Assessment (Appendix 4) and Concurrence from USFWS (Appendix 7).

Common Name	Scientific Name	Status	Occurrence	Determination (If applicable)
Sonoran Green toad	*Anaxyrus retiformis*	BLM Sensitive	The species is not known to occur within the analysis area. The nearest observation in the last 20 years is approximately 20 miles south of the analysis area. Most of the analysis area is within SWAP Predicted Range for the species.	NA
Sonoran Pronghorn	*Antilocapra americana sonoriensis*	Endangered 10(j) non-essential Experimental Population	The species currently does not occur in the analysis area; however, the analysis area is within a non-essential experimental population area.	Not Likely to Jeopardize
Western Burrowing Owl	*Athene cunicularia hypugaea*	BLM Sensitive USFWS Species of Concern	The species is not known to occur within the analysis area. Species has been observed in the last 10 years adjacent to the analysis area. Most of the analysis area is within SWAP Predicted Range for the species.	NA
Western Yellow-billed Cuckoo	*Coccyzus americanus*	Threatened	The species is known to occur within 5 miles of the analysis area, and suitable habitat is present. Livestock would be excluded from accessing suitable habitat.	No Effect
Desert Pupfish	*Cyprinodon macularius*	Endangered	The species is known to occur within 3 miles of the analysis area. The analysis area does not contain suitable habitat, and livestock would be excluded from accessing adjacent suitable habitat.	No Effect
Monarch Butterfly	*Danaus plexippus*	Proposed Threatened	The species is known to occur in the analysis area, and there is suitable habitat in the analysis area.	Not Likely to Jeopardize
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered	The species is known to occur within the analysis area, though no suitable mapped habitat is present. Livestock would be excluded from accessing adjacent suitable habitat.	No Effect
Cactus Ferruginous Pygmy Owl	*Glaucidium brasilianum cactorum*	Threatened	The species is not known to occur in the analysis area, although there is suitable habitat.	May Affect, not Likely to Adversely Affect
Sonoran Desert Tortoise	*Gopherus morafkai*	BLM Sensitive CCA	The species is known to occur in the analysis area. The analysis area contains BLM Category I, II, and III habitat, and most of the analysis area	NA

Common Name	Scientific Name	Status	Occurrence	Determination (If applicable)
			is within SWAP Predicted Range for the species.	
Pinyon Jay	*Gymnorhinus cyanocephalus*	BLM Sensitive	The species is not known to occur in the analysis area. The analysis area is located approximately 45 miles southwest of the SWAP Predicted Range for the species and there have been no recorded observations within 50 miles of the analysis area.	NA
Bald Eagle-Winter Population	*Haliaeetus leucocephalus* (wintering population)	BLM Sensitive USFWS Species of Concern	The species is not known to occur in the analysis area. There have been recorded observations adjacent to the analysis area in the last 5-10 years.	NA
Bald Eagle	*Haliaeetus leucocephalus*	BLM Sensitive USFWS Species of Concern	The species is not known to occur in the analysis area. There have been recorded observations adjacent to the analysis area in the last 0-2 years. Most of the analysis area falls within SWAP Predicted Range for the species.	NA
California Leaf-nosed Bat	*Macrotus californicus*	BLM Sensitive USFWS Species of Concern	The species is not known to occur in the analysis area. There have been no recorded observations in the last 10 years within 8 miles of the analysis area. The entire analysis area falls within the SWAP Predicted Range for the species.	NA
Gila Topminnow	*Poeciliopsis occidentalis*	Endangered	The species is known to occur within 2 miles of the analysis area. The analysis area does not contain suitable habitat, and livestock would be excluded from accessing adjacent suitable habitat.	No Effect
Yuma Ridgway's Rail	*Rallus obsoletus yumanensis*	Endangered	The species is known to occur within 5 miles of the analysis area, and suitable habitat is present. Livestock would be excluded from accessing suitable habitat.	No Effect
Lowland Leopard Frog	*Rana yavapaiensis*	BLM Sensitive USFWS Species of Concern	The species has been recorded within the analysis area in the last 10-15 years on private land. Most of the analysis area falls within SWAP Predicted Range for the species.	NA
California least tern	*Sterna antillarum browni*	Endangered	The species does not occur in the analysis area as no open sand beaches, sandbars, or shorelines are present.	No Effect

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Gila Topminnow

There is no mapped suitable habitat for the Gila topminnow within the analysis area but there is a documented observation within 3 miles of the analysis areaarea. This species is an aquatic obligate. They are omnivorous and feed primarily on detritus, algae, and aquatic invertebrates. (USFWS 2025b)

Monarch Butterfly

Appropriate habitat exists within the analysis area for Monarch Butterfly and there have been recorded observations within the analysis area in the last 5 years. The monarch occurs throughout a wide variety of habitat, though breeding requires their obligate milkweed host plants (*Asclepias* spp.). Breeding may occur year-round in temperate climates.

3.5.1.4 Migratory Birds

The analysis area contains suitable habitat for many migratory birds. Typical migratory bird species include mourning dove (*Zenaida macroura*), Gambel's quail (*Callipepla gambelii*), phainopepla (*Phainopepla nitens*), and cactus wren (*Campylorhynchus brunneicapillus*). 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. Additional protections are provided for migratory birds by the Neotropical Migratory Bird Conservation Act of 2000 (16 USC Chapter 80), and Executive Order 13186, which requires the BLM and other federal agencies to work with FWS to provide protection for migratory birds, primarily in the form of habitat protection to avoid migratory pattern disruption. Birds found within the analysis area are typical of desert scrub and riparian habitat. For more information on migratory birds that may occur within the analysis area see Section 3.2.13 of the Lower Sonoran/SDNM FEIS (BLM 2012b). Additional information and analysis on the impacts to General Wildlife, the BLM Sensitive Species, Threatened and Endangered Species, and Migratory Birds is detailed in the 2024 SDNM Livestock Grazing RMPA EA DOI-BLM-AZ-P040-2024-0001-RMP-EA in sections 3.7 and 4.9 (pp 30-37, 65-66.

3.5.2 Environmental Impacts

Alternative A- No Action Alternative

Under the No Action Alternative, cattle grazing would be maintained with the existing terms and conditions. Ephemeral grazing would occur in the Arnold Allotment. The Beloat Allotment would be authorized for 287 cattle (2859 AUMs) for the allotment with the option for ephemeral use, "when forage conditions warrant". No new range improvements would be authorized under this alternative.

Arnold and Beloat Allotments

General Wildlife and Migratory Birds

Both livestock and wildlife utilize vegetation. Various wildlife species (e.g., bighorn sheep, mule deer, reptiles, and some migratory birds) depend on forbs and shrubs for forage and concealment. Insectivorous species such as bats and some migratory birds, are indirectly dependent on herbaceous vegetation to support their insect diet or to provide a substrate for nesting, roosting, or concealment. Some bird species are further dependent on herbaceous vegetation for nesting materials, habitat, and roosting. Larger predator species are also indirectly dependent on herbaceous vegetation to provide forage and cover for prey species such as small mammals, reptiles, amphibians, 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. Fencing associated with livestock may affect the ability of wildlife species to move between and within the Allotments, though fencing is not expected to impact the movements of migratory birds. Where existing fences in wildlife habitat do not meet the BLM specifications, they will be modified according to BLM Manual 1741 when they are scheduled for replacement or major maintenance and as funding permits. Damaged or unrepaired fencing may be an entanglement hazard for wildlife species, including migratory birds. Under this alternative, permittees would be responsible for maintaining and repairing fencing, and entanglement hazards are not expected. Competition between livestock and a variety of wildlife species can occur in areas with low perennial grass composition where livestock and wildlife are more likely to utilize the same browse forage species. According to the 2024 LHE, there are areas that are not achieving Standards because of

historical livestock grazing. One of the three ecological sites on the Arnold Allotment is not achieving Standard 3 and two of the seven ecological sites on the Beloat Allotment are not achieving Standard 1 because of livestock grazing.

BLM Sensitive Species

SDT and lowland leopard frogs have been observed within the analysis area. Both livestock and these species utilize vegetation. SDT depend on forbs and shrubs for forage and concealment, which may be impacted by livestock grazing. The presence and movement of livestock between areas can result in the direct disturbance or displacement of SDT from areas providing cover and forage. The presence of livestock reservoirs in the Allotments may attract SDT by providing water sources and may attract lowland leopard frogs by providing potential breeding and foraging opportunities. Potential negative impacts to SDT include trampling risk and decreased forage within a 2-mile radius of livestock waters, where grazing tends to concentrate (Appendix 5). Potential soil disturbance and overgrazing may lead to an increased spread of invasive plant species through various means, including disruption of stabilizing features such as biotic crusts, desert pavement, and established native vegetation, which may provide opportunities for the establishment and spread of invasive plant species. Soil compaction from livestock usage may also affect native plant establishment. These actions may lead to negative impacts on vegetation communities which could negatively affect forage availability and quality for SDT. Additionally, soil compaction may affect the ability of SDT to establish new burrows. The SDT tend to utilize rock burrows or burrows in caliche soils, which are less likely to be collapsed by cattle. There may be negative impacts to lowland leopard frogs including trampling risk for frogs associated with the livestock reservoirs and potential interference from livestock consumption of water during breeding. Potential positive impacts include increased availability of water for both species and provision of potential breeding and foraging habitat for lowland leopard frogs. Fencing associated with livestock is not expected to affect the ability of either species to move between and within the Allotments.

Sonoran green toads, western burrowing owls, bald eagles, and California leaf-nosed bats are not known to occur within the analysis area, but the analysis area falls within SWAP-predicted ranges for all four species. Both livestock and those species utilize vegetation. Sonoran green toads and western burrowing owl depend on forbs and shrubs for concealment, and both species, as well as California leaf-nosed bats, may depend on forbs and shrubs to provide potential forage opportunities and habitat for their prey species. Livestock grazing may impact populations of forbs and shrubs, and thereby potentially impact populations of prey species. The presence and movement of livestock between areas may result in the direct disturbance or displacement of Sonoran green toads and western burrowing owls from areas providing cover and forage sources. The presence of livestock reservoirs in the Allotments may attract Sonoran green toads, western burrowing owls, California leaf-nosed bats, and bald eagles by providing water sources for all four species, foraging opportunities for all four species except the bald eagle, and potential breeding opportunities for Sonoran green toads, which may have a positive impact for these species. Potential negative impacts to Sonoran green toads include trampling risk within a 2-mile radius of livestock waters, where grazing tends to concentrate, and potential interference with breeding and reproduction from livestock consumption of water. Fencing associated with livestock is not expected to affect the ability of any of these species to move between and within the Allotments. Damaged or unrepaired fencing may be an entanglement hazard for bald eagles and western burrowing owls. Under this alternative, permit holders are responsible for maintaining and repairing fencing, so no impacts from damaged or unrepaired fencing would be expected to any BLM sensitive species.

Under the No Action Alternative, range improvements such as existing water developments and existing fencing, would continue to be maintained by permittees in the Allotments available for livestock grazing. Maintaining wells and dirt tanks would benefit the BLM sensitive species by providing an additional water source. The 2024 LHE concludes one of the three ecological sites on the Arnold Allotment is not achieving Standard 3 and two of the seven ecological sites on the Beloat Allotment are not achieving Standard 1 because of livestock grazing. Under the No Action Alternative, the commitments made by the BLM in the LSFO RMP and the SDT CCA may not be met in areas which are failing to achieve the standards as non-achievement could indicate impacts on forage and habitat availability for BLM Sensitive Species.

Threatened and Endangered Species

The cactus ferruginous pygmy-owl, Sonoran pronghorn, and monarch butterfly occur or are likely to occur in the analysis area in the next 10 years. Suitable habitat for the southwestern willow flycatcher does not occur within the analysis area, but exists approximately 1 mile west, and the species has been recorded within the area once in the last 10 years in riparian habitat.

Under the No Action Alternative, grazing could result in damage to potential roosting or nesting vegetation for the cactus ferruginous pygmy owl (e.g., columnar cacti). The majority of roosting or nesting vegetation in the analysis area would not be affected. The level of the anticipated effects to available habitat is insignificant. There are no anticipated direct or indirect threats to roost or nesting sites as none have been identified to occur within the analysis area. The presence of cattle could potentially result in roosting or nesting habitat avoidance. However, such avoidance has not been documented so effects would be unlikely. Cactus ferruginous pygmy owls depend on forbs and shrubs to provide habitat for their prey species and thereby forage opportunities. Livestock grazing may impact populations of forbs and shrubs, and thereby potentially impact forage opportunities and populations of prey species.

While many of the potential effects of livestock on Sonoran pronghorn are not well known or understood, livestock grazing may impact or degrade soils and cause changes in vegetation communities if not managed properly. Direct competition for forage resources may occur, as there is dietary overlap between livestock and Sonoran pronghorn. Livestock may compete with Sonoran pronghorn for preferred thermal cover, and Sonoran pronghorn may avoid areas with livestock, although this has not been well documented. The possibility for disease transmission from livestock to Sonoran pronghorn also exists. Sonoran pronghorn may become entangled and injured in livestock fences, and they may be more vulnerable to predation as they must slow down and crouch to go under fences. Under this alternative, permit holders are responsible for maintaining and repairing fencing, so no impacts from damaged or unrepaired fencing would be expected. Human presence (on foot, horseback, and vehicle) associated with cattle management could result in disturbance to Sonoran pronghorn in the area and could reduce the conservation value of portions of the 10(j) area. Human presence for livestock management would be intermittent but ongoing for the duration of the proposed action (10 years). This disturbance may be insignificant relative to disturbance caused by public recreation (e.g., hunting, off-road vehicle use, etc.). The presence of livestock waters may provide a benefit to Sonoran pronghorn by providing water sources where water availability is limited.

Limited information is available on the direct effects of grazing on monarchs that would allow for quantification of direct mortality of any life stage. However, inferences may be drawn from literature describing the effects of grazing on other pollinators and on resources such as nectar plants, forb availability, and other aspects pertinent to understanding how grazing can affect the species (NRCS and USFWS 2024). Direct effects of prescribed grazing by domestic animals may include mortality and injury through trampling. The degree of these effects would depend on timing, area, intensity, frequency, and duration of grazing. Indirect effects could also occur through habitat alteration. Prescribed grazing may result in soil compaction from livestock and human activity. The reduced infiltration of water in compacted soils can hinder the re-establishment of seedlings or the growth of established plants. Increased erosion could also occur due to the removal of vegetation from the site and exposure of bare soil, all of which could negatively impact the monarch.

The southwestern willow flycatcher is a riparian obligate species found throughout the Southwest, where it breeds in dense riparian habitats along rivers, streams, or wetland areas where trees and shrubs are adjacent to or near surface water. This species depends on riparian vegetation for concealment, nesting opportunities, and forage opportunities. Existing fencing between the Northwest pasture of the Beloat allotment (Figure 3) and the Gila River may not be adequate to prevent livestock intrusion from the pasture into riparian habitat. Livestock grazing may impact riparian vegetation and habitat, and thereby potentially impact this species. The presence and movement of livestock between areas may result in the direct disturbance or displacement of this species from areas providing cover and forage sources. The presence of livestock reservoirs in the Allotments may attract this species by providing water sources and foraging opportunities. Potential positive impacts include increased availability of water and potential forage opportunities. Fencing associated with livestock is not expected to affect the ability of southwestern willow flycatchers to move between and within the Allotments. Under this alternative,

existing fencing would be required to be repaired prior to livestock stocking in the West pasture of the Arnold allotment (Figure 2), which would reduce potential intrusions of livestock into riparian habitat and subsequent potential impacts. Under this alternative, permit holders are responsible for maintaining and repairing fencing, so no impacts from damaged or unrepaired fencing would be expected.

There is suitable habitat for the yellow-billed cuckoo and Yuma Ridgway's rail along the northern portion of the analysis area. Yellow-billed cuckoos have been observed in the riparian area along the Gila River on the northern boundary of the analysis area. Yuma Ridgway's rails have not been observed in the analysis area or bordering riparian area but have been observed in the last 5 years within 2 miles of the analysis area. Both livestock and these species utilize vegetation. Both species depend on riparian vegetation for concealment, nesting opportunities, and forage opportunities. Existing fencing between the Northwest pasture of the Beloat allotment (Figure 3) and the Gila River may not be adequate to prevent livestock intrusion from the pasture into riparian habitat. Livestock grazing may impact riparian vegetation and habitat, and thereby potentially impact these species. The presence and movement of livestock between areas may result in the direct disturbance or displacement of these species from areas providing cover and forage sources. The presence of livestock reservoirs in the Allotments may attract both species by providing water sources and foraging opportunities. Potential positive impacts include increased availability of water for both species and potential forage opportunities. Fencing associated with livestock is not expected to affect the ability of these species to move between and within the Allotments, Damaged or unrepaired fencing may be an entanglement hazard for both species. Under this alternative, permit holders are responsible for maintaining and repairing fencing, so no impacts from damaged or unrepaired fencing would be expected. Under this alternative, existing fencing would be required to be repaired prior to livestock stocking in the West pasture of the Arnold allotment (Figure 2), which would reduce potential intrusions of livestock into riparian habitat and subsequent potential impacts.

Desert pupfish and Gila topminnow have been recorded to occur less than 3 miles from the analysis area in the Gila River, though there is no suitable habitat within the analysis area. Both species depend on aquatic habitat for all aspects of their life cycle. Existing fencing between the Northwest pasture of the Beloat allotment (Figure 3) and the Gila River may not be adequate to prevent livestock intrusion from the pasture into aquatic habitat. Potential impacts from livestock intrusion into aquatic habitat include increased erosion, sedimentation, and nutrient loading from livestock feces, all of which may affect the quality of aquatic habitat for both fish species. Under this alternative, existing fencing would be required to be repaired prior to livestock stocking in the West pasture of Arnold Allotment which would reduce potential intrusions of livestock into aquatic habitat and subsequent potential impacts.

Under the No Action Alternative, range improvements such as water developments and existing fencing, would continue to be maintained by permittees in the Allotments available for livestock grazing. Maintaining wells and dirt tanks would benefit threatened and endangered species by providing an additional water source.

Alternative B- Resource Protection Alternative

Arnold Allotment

Under this alternative the Arnold allotment would continue to be authorized for ephemeral grazing only. However, this alternative includes additional terms and conditions that would require the year-to-date rainfall to be 90% of average or greater before an application for ephemeral use could be approved. It would also limit cattle use of ephemeral forage to 40%. In the Resource Protection Alternative, ephemeral grazing applications would only be approved on a 30-day basis between April 1 and September 30. The types of cattle impacts (e.g., soil disturbances, competition for forage and shade) from the Resource Protection Alternative would be similar to those in the No Action Alternative. However, the additional constraints on ephemeral grazing would likely reduce the magnitude or duration of those impacts. No new range improvements are proposed or authorized under this alternative.

General Wildlife and Migratory Birds

The changes in terms and conditions outlined in the Resource Protection Alternative would better maintain habitat and access to forage for general wildlife and migratory birds. Adjustments in season of use, such as authorizing ephemeral grazing only, can allow forage plants to withstand grazing during certain times of the year as compared to others (Caldwell 1984). Ephemeral grazing limits the frequency

of livestock/wildlife interactions, especially in wash communities that serve as forage areas and movement corridors, and competition for perennial browse. Excluding livestock from sensitive areas, such as riparian and aquatic habitat, through pasture fencing, would reduce potential impacts to many species and habitat. The Resource Protection Alternative would have fewer impacts on general wildlife and migratory birds than the No Action Alternative, because the proposed management would make more forage resources available for wildlife, cause fewer adverse impacts to habitat, and result in fewer livestock to displace or disturb wildlife.

Under the Resource Protection Alternative, range improvements such as water developments and existing fencing, would continue to be maintained by permittees in areas available for livestock grazing. Maintaining wells and dirt tanks would benefit wildlife by providing an additional water source.

BLM Sensitive Species

Restricting the approval of ephemeral grazing applications to 30-day periods from April 1 through September 30 would allow for more adaptive management of grazing during the most active time period for SDT. This would reduce the risk that cattle might over-utilize annual plant forage and allow for adequate annual forage to remain on the landscape for BLM sensitive species, including the SDT.

The changes in terms and conditions outlined in the Resource Protection Alternative would better maintain habitat and access to forage for BLM sensitive species. Ephemeral grazing limits the frequency of livestock/wildlife interactions, especially in wash communities that serve as forage areas and movement corridors, and competition for perennial browse. Ephemeral grazing reduces habitat degradation relative to perennial grazing over broad areas by allowing for the restriction or removal of livestock when forage is not available. This reduces potential soil disturbance and overgrazing, which in turn reduces the risk of spread of invasive plant species by reducing the disruption of stabilizing features such as biotic crusts, desert pavement, and established native vegetation, and reduces the risk of impacts on vegetation communities, which could negatively affect forage availability and quality for SDT. The flexibility and criteria required, including the 2015 Sonoran Desert Tortoise CCA and the DPCs established in the LHE, to authorize ephemeral grazing would allow adequate and suitable native forage, space, and cover to be available to desert tortoises throughout the year, maintain or increase the productivity of native plants important to desert tortoises and reduce potential impacts to wildlife and habitat (Avery 1997). Measures to decrease the potential dangers from livestock to desert tortoise, such as accidental crushing by livestock, include limiting ephemeral grazing authorizations to lessen potential impacts of active grazing during time periods of highest desert tortoise activity. Burrows may also be crushed by livestock, however this is unlikely because most of the burrows within the analysis area are under rocks in steep boulder-strewn habitat or in the cut banks of incised desert washes and caliche soils, where cattle are not likely to graze (Boarman 2002). Soil compaction may affect the ability of SDT to establish new burrows, though areas that may experience compaction are likely to be outside of the typical habitat in which SDT prefer to establish burrows. Soil compaction from livestock usage may also affect native plant establishment. Excluding livestock from sensitive areas, such as riparian and aquatic habitat, through pasture fencing would reduce potential impacts to many species and their habitat. The Resource Protection Alternative would have fewer impacts on BLM sensitive species than the No Action Alternative, because the proposed management would lessen grazing pressure and minimize potential impacts by authorizing fewer livestock, resulting in more forage resources remaining on the landscape available for BLM sensitive species, fewer adverse impacts to habitat, and fewer livestock to displace or disturb species. The additional constraint to authorize ephemeral grazing only when rainfall is at least 90% of normal would eliminate grazing in the allotment if that condition is not met and would preserve all available forage for wildlife use. This management would allow the BLM to meet, and potentially exceed, the commitments made for sensitive species in the LSFO RMP as well as those specific to Sonoran desert tortoise in the SDT CCA.

Threatened and Endangered Species

The cactus ferruginous pygmy-owl, Sonoran pronghorn, and monarch butterfly occur or are likely to occur in the analysis area in the next 10 years. Suitable habitat for the southwestern willow flycatcher does not occur within the analysis area, but exists approximately 1 mile west, and the species has been recorded within the area once in the last 10 years in riparian habitat. Potential impacts to cactus ferruginous pygmy owl would include possible damage to potential roosting or nesting vegetation, roosting or nesting habitat

avoidance, and decreased forage opportunities. Potential impacts to Sonoran pronghorn would include possible degradation of soils or changes in vegetation communities, direct competition for forage resources, competition for preferred thermal cover, avoidance of areas where livestock are present, disease transmission, entanglement and increased risk of predation from existing fencing which may impede the ability of species' to escape and increased human presence associated with cattle management. Potential impacts to monarch butterfly would include possible mortality and injury through trampling, reduced availability of forage and breeding vegetation, and habitat alteration. Potential impacts to southwestern willow flycatcher would not be expected as existing fencing along the West pasture would be repaired prior to stocking of livestock within the pasture and would exclude livestock from accessing any riparian areas. The additional terms and conditions under this alternative are expected to decrease the likelihood and severity of these potential impacts on species.

The Gila River on the northern border of the Allotments provides suitable habitat for the yellow-billed cuckoo and the Yuma Ridgway's rail. Yellow-billed cuckoos have been observed in the riparian area along the Gila River on the northern boundary of the analysis area. Yuma Ridgway's rails have not been observed in the bordering riparian area but have been observed in the last 5 years within 2 miles of the analysis area. In addition, the desert pupfish and Gila topminnow have been recorded to occur less than 3 miles from the analysis area in the Gila River and may occur in the portion of the river adjacent to the analysis area. Existing fencing along the West pasture would be repaired prior to stocking livestock within the pasture. Excluding livestock from the Northwest pasture would keep livestock from accessing riparian and aquatic habitat and ensure livestock do not impact the forage, habitat, or prey populations for these species.

Under the Resource Protection Alternative, range improvements such as water developments and existing fencing would continue to be maintained by permittees in the Allotments available for livestock grazing. Threatened and endangered species could benefit by having access to those water sources.

The changes in terms and conditions outlined in the Resource Protection Alternative would improve the compatibility of livestock grazing with and maintain habitat and access to forage for threatened and endangered species. Ephemeral grazing limits the frequency of livestock/wildlife interactions, especially in wash communities that serve as forage areas and movement corridors, and competition for perennial browse. Excluding livestock from sensitive areas, such as riparian and aquatic habitat, through pasture fencing would reduce potential impacts to many species and habitat. The Resource Protection Alternative would have fewer impacts on threatened and endangered species than the No Action Alternative, because the proposed management would make more forage resources available for wildlife, cause fewer adverse impacts to habitat, and result in fewer livestock to displace or disturb wildlife.

Beloat Allotment

Under this alternative, five of the six pastures in the Beloat allotment would be authorized for grazing. The Southeast, West, and SDNM/Southwest pastures would be authorized for ephemeral grazing only (Table 6). The Estrella and Northeast pastures would be authorized for 433 AUMs of perennial grazing with the potential for additional grazing on an ephemeral basis (Table 6). Perennial grazing may not occur in the Northwest pasture without the installation of a physical or virtual fence to control livestock movement and prevent livestock drift into the Gila River, surrounding riparian corridor, and the Gila Waterfowl Wildlife Management Area. Any new fencing would be approved through a separate grazing decision supported by additional NEPA analysis. This alternative also includes additional terms and conditions that would require the year-to-date rainfall to be at least 90% of average before an application for ephemeral use could be approved. It would also limit the use of ephemeral forage to 40% and require the removal of all livestock from ephemeral pastures when utilization reaches an average of 35% across the pasture, and restrict ephemeral grazing authorizations to 30-day approval timelines from April 1 through September 30. No new range improvements are proposed or authorized under this alternative.

General Wildlife and Migratory Birds

The changes in terms and conditions outlined in the Resource Protection Alternative would better maintain habitat and access to forage for general wildlife and migratory birds. Closing grazing in the Northwest Pasture and limiting grazing forage to annual plant species in the West, SDNM (Southwest), and Southeast pastures would limit the frequency of livestock/wildlife interactions, especially in wash

communities that serve as forage areas and movement corridors, and competition for perennial browse. Excluding livestock from sensitive areas, such as riparian and aquatic habitat, through pasture fencing, would reduce potential impacts to many species and habitat. In pastures which have areas failing to achieve Standards due to livestock grazing, perennial grazing would not be authorized within those pastures until Standards are being met, or until the BLM concludes that livestock grazing is not the cause of any continuing failure, which would improve wildlife habitat in these areas. The Resource Protection Alternative would have fewer impacts on general wildlife and migratory birds than the No Action Alternative because the proposed management would ensure more forage resources are available for wildlife, cause fewer adverse impacts to habitat, and result in fewer livestock to displace or disturb wildlife.

Under the Resource Protection Alternative, range improvements such as water developments and existing fencing, would continue to be maintained by permittees in areas available for livestock grazing. Wildlife may benefit from access to those water sources.

BLM Sensitive Species

The changes in terms and conditions outlined in the Resource Protection Alternative would better maintain habitat and access to forage for BLM sensitive species. Closing grazing in the Northwest Pasture and limiting grazing forage to annual plant species in the West, SDNM (Southwest), and Southeast pastures would limit the frequency of livestock/wildlife interactions, especially in wash communities that serve as forage areas and movement corridors, and competition for perennial browse. Excluding livestock from sensitive areas, such as riparian and aquatic habitat, through pasture fencing, would reduce potential impacts to many species and habitat. In pastures failing to achieve Rangeland Health Standards due to livestock grazing, perennial grazing would not be authorized until those standards are met, or until the BLM concludes that livestock grazing is not the cause of any continuing failure, which would improve wildlife habitat in these areas.

The additional terms and conditions applied to this alternative would restrict the approval of ephemeral grazing applications to 30-day periods between April 1 and September 30, during the most active season for SDT, which would allow for more adaptive management. Perennial grazing would be eliminated in the Estrella pasture between April 1 and October 31. This reduces potential soil disturbance and overgrazing, which in turn reduces the risk of spread of invasive plant species by reducing the disruption of stabilizing features such as biotic crusts, desert pavement, and established native vegetation, and reduces the risk of impacts on vegetation communities, which could negatively affect forage availability and quality for SDT. This would ensure adequate and suitable native forage, space, and cover remain available to desert tortoises throughout the year, maintain or increase the productivity of native plants important to desert tortoises, and reduce potential impacts to wildlife and habitat (Avery 1997). Measures to decrease the potential dangers from livestock to desert tortoise, such as accidental crushing by livestock, include limiting ephemeral grazing authorizations to lessen potential impacts of active grazing during time periods of highest desert tortoise activity. Burrows may also be crushed by livestock, however this is unlikely because most of the burrows within the habitat are under rocks in steep boulder-strewn habitat or in the cut banks of incised desert washes and caliche soils, where cattle are not likely to graze (Boarman 2002). Additionally, authorizing ephemeral only grazing limits cattle numbers and limits grazing authorizations to only 30 days between April 1- September 30, which allows for more adaptive management response to forage conditions during the most active season for SDT. This would decrease the risks of accidental collapsing of burrows or shelters. Soil compaction may affect the ability of SDT to establish new burrows, though areas that may experience compaction are likely to be outside of the typical habitat in which SDT prefer to establish burrows. Soil compaction from livestock usage may also affect native plant establishment. The Resource Protection Alternative would have fewer impacts on BLM sensitive species than the No Action Alternative, as the proposed management would lessen grazing pressure and minimize potential impacts by authorizing fewer livestock, resulting in more forage resources remaining on the landscape available for BLM sensitive species, fewer adverse impacts to habitat, and fewer livestock to displace or disturb species. The additional condition that the BLM may only authorize ephemeral grazing when rainfall is at least 90% of normal would eliminate grazing in the ephemeral pastures of the allotment unless that condition is met and would preserve all available forage for wildlife use. Additionally, all livestock would be removed from ephemeral pastures when utilization reaches an average of 35% across the pasture. This management approach would allow the BLM to meet, and

potentially exceed, the commitments made for sensitive species in the LSFO RMP as well as those specific to Sonoran desert tortoise in the SDT CCA.

Threatened and Endangered species

When compared to the No Action Alternative, no additional acres of the Beloat Allotment would be authorized for grazing. The Southeast, West, and SDNM/Southwest pastures would be authorized for ephemeral grazing only. The Estrella and Northeast pastures would be authorized for perennial and ephemeral grazing. Perennial grazing would not occur in the Northwest pasture without the installation of a physical or virtual fence to control livestock movement and prevent livestock drift into the Gila River, riparian corridor, and the Gila Waterfowl Wildlife Management Area. Any new fencing must be approved through a separate grazing decision supported by additional NEPA analysis.

Under the Resource Protection Alternative, types of cattle impacts (e.g., soil disturbances, competition for forage and shade) are expected to be similar in nature to those of the No Action Alternative for threatened and endangered species. However, these impacts are expected to be of a lesser degree. Impacts to riparian obligate and aquatic species under this alternative are not expected due to the exclusion of livestock from accessing riparian and aquatic habitat.

The cactus ferruginous pygmy-owl, Sonoran pronghorn, and monarch butterfly occur or are likely to occur in the analysis area in the next 10 years. Suitable habitat for the southwestern willow flycatcher does not occur within the analysis area, but exists approximately 1 mile west, and the species has been recorded within the area once in the last 10 years in riparian habitat. Potential impacts to cactus ferruginous pygmy owl would include possible damage to potential roosting or nesting vegetation, roosting or nesting habitat avoidance, and decreased forage opportunities. Potential impacts to Sonoran pronghorn would include possible degradation of soils or changes in vegetation communities, direct competition for forage resources, competition for preferred thermal cover, avoidance of areas where livestock are present, disease transmission, entanglement and increased risk of predation from existing fencing, and increased human presence associated with cattle management. Potential impacts to monarch butterfly would include possible mortality and injury through trampling, reduced availability of forage and breeding vegetation, and habitat alteration. Potential impacts to southwestern willow flycatcher would not be expected as no grazing would be allowed within the Northwest pasture, which would exclude livestock from accessing any riparian areas. The additional terms and conditions under this alternative are thereby expected to decrease the likelihood and severity of any potential impacts to these species.

The Gila River on the northern border of the Allotments provides suitable habitat for the yellow-billed cuckoo and the Yuma Ridgway's rail. Yellow-billed cuckoos have been observed in the riparian area along the Gila River on the northern boundary of the analysis area. Yuma Ridgway's rails have not been observed in the bordering riparian area but have been observed in the last 5 years within 2 miles of the analysis area. In addition, the desert pupfish and Gila topminnow have been recorded to occur less than 3 miles from the analysis area in the Gila River and may occur in the portion of the river adjacent to the analysis area. No grazing would be allowed within the Northwest pasture under this alternative. Excluding livestock from the Northwest pasture would keep livestock from accessing riparian and aquatic habitat and ensure livestock do not impact the forage, habitat, or prey populations for these species.

The changes in terms and conditions outlined in the Resource Protection Alternative would better maintain habitat and access to forage for threatened and endangered species. Closing grazing in the Northwest Pasture and limiting grazing forage to annual plant species in the West, SDNM (Southwest), and Southeast pastures would limit the frequency of livestock/wildlife interactions, especially in wash communities that serve as forage areas and movement corridors, and competition for perennial browse. Excluding livestock from sensitive areas, such as riparian and aquatic habitat, through pasture fencing, would reduce potential impacts to many species and habitat. In pastures which have areas failing to achieve Standards due to livestock grazing, perennial grazing would not be authorized within those pastures until Standards are being met, or until the BLM concludes that livestock grazing is not the cause of any continuing failure, which would improve wildlife habitat in these areas. The Resource Protection Alternative would have fewer impacts on BLM sensitive species than the No Action Alternative, because the proposed management would make more forage resources available for species, cause fewer adverse impacts to habitat, and result in fewer livestock to displace or disturb species.

Under the Resource Protection Alternative, range improvements such as water developments and existing fencing, would continue to be maintained by permittees in the Allotments available for livestock grazing.

Alternative C- Ephemeral Grazing Alternative

Arnold Allotment

The terms and conditions for the Ephemeral Grazing Alternative would require the year-to-date rainfall to be at least 90% of average before an application for ephemeral use could be approved. It would also limit the use of ephemeral forage to 40% and restrict ephemeral grazing authorizations to 30-day use permits from April 1 through September 30. For the Arnold Allotment, the Ephemeral Grazing Alternative has the same terms and conditions as the Resource Protection Alternative. As a result, the impacts to wildlife, migratory birds, BLM sensitive species, and threatened and endangered species, would be the same as under the Resource Protection Alternative. No new range improvements would be authorized under this alternative.

Beloat Allotment

Under this alternative, five of six pastures in the Beloat allotment would be authorized for ephemeral use only. Perennial grazing would no longer be authorized on the allotment. Additionally, this alternative includes terms and conditions for ephemeral grazing that require that the year-to-date rainfall be at least 90% of average before an application for ephemeral use could be approved. Ephemeral forage utilization would be limited to 40%, and ephemeral grazing authorizations would be limited to 30-day periods from April 1 through September 30.

General Wildlife and Migratory Birds

The Ephemeral Grazing Only Alternative would eliminate perennial grazing and convert the Beloat allotment to ephemeral use only. Ephemeral use has the potential to lessen habitat degradation over broad areas that may be caused by livestock grazing by allowing for the restriction or removal of livestock when forage and land health requirements are not being met. In pastures which have areas failing to achieve Standards due to livestock grazing, grazing would not be authorized within those pastures until Standards are being met, or until the BLM concludes livestock grazing is not the cause of any continuing failure, which would improve habitat in these areas. Ephemeral grazing limits the frequency of livestock/wildlife interactions, especially in wash communities that serve as forage areas and movement corridors, and competition for perennial browse. The flexibility and criteria required to approve ephemeral grazing would reduce potential impacts to wildlife and wildlife habitat.

Under the Ephemeral Grazing Only Alternative, water developments and existing fencing would be maintained by permittees on the Allotments available for livestock grazing.

BLM Sensitive Species

The Ephemeral Only Alternative would ensure 60% of annual plant forage would remain for wildlife including the SDT. Restricting ephemeral grazing authorizations to 30-day periods between April 1 and September 30 would allow for adaptive grazing management during the most active period for SDT.

Compatibility of livestock grazing with BLM sensitive species would be achieved through adjustments in the number of authorized AUMs based on forage availability, authorization of ephemeral grazing only, and exclusion of sensitive areas. Ephemeral grazing limits the frequency of livestock/wildlife interactions, especially in wash communities that serve as forage areas and movement corridors, and competition for perennial browse. Ephemeral grazing reduces habitat degradation relative to perennial grazing over broad areas by allowing for the restriction or removal of livestock when forage is not available. This reduces potential soil disturbance and overgrazing, which in turn reduces the risk of spread of invasive plant species by reducing the disruption of stabilizing features such as biotic crusts, desert pavement, and established native vegetation, and reduces the risk of impacts on vegetation communities, which could negatively affect forage availability and quality for SDT. The flexibility and criteria required, including the 2015 Sonoran Desert Tortoise CCA and the DPCs established in the LHE, to authorize ephemeral grazing would allow adequate and suitable native forage, space, and cover to be available to desert tortoises throughout the year, maintain or increase the productivity of native plants important to desert tortoises, and reduce potential impacts to wildlife and habitat (Avery 1997). Measures to decrease the

potential dangers from livestock to desert tortoise, such as accidental crushing by livestock, include limiting ephemeral grazing authorizations to lessen potential impacts of active grazing during time periods of highest desert tortoise activity. Burrows may also be crushed by livestock, however this is unlikely because most of the burrows within the analysis area are under rocks in steep boulder-strewn habitat or in the cut banks of incised desert washes and caliche soils, where cattle are not likely to graze (Boarman 2002). Soil compaction may affect the ability of SDT to establish new burrows, though areas that may experience compaction are likely to be outside of the typical habitat in which SDT prefer to establish burrows. Soil compaction from livestock usage may also affect native plant establishment. Excluding livestock from sensitive areas, such as riparian and aquatic habitat, through pasture fencing would reduce potential impacts to many species and habitat. In pastures which have areas failing to achieve Standards due to livestock grazing, perennial grazing would not be authorized within those pastures until Standards are being met, or are not failing due to livestock grazing, which would improve BLM sensitive species habitat in these areas. The Ephemeral Grazing Alternative would have fewer impacts on BLM sensitive species than the No Action Alternative because it would lessen grazing pressure and minimize potential impacts by authorizing ephemeral grazing only, resulting in more forage resources remaining on the landscape available for BLM sensitive species, fewer adverse impacts to habitat and prey species populations, and fewer livestock to displace or disturb species. The additional constraint to authorize ephemeral grazing only when rainfall is at least 90% of normal would eliminate grazing in the allotment if that condition is not met and would preserve all available forage for wildlife use. This management would allow the BLM to meet, and potentially exceed, the commitments made for sensitive species in the LSFO RMP as well as those specific to Sonoran desert tortoise in the SDT CCA.

Threatened and Endangered Species

The cactus ferruginous pygmy-owl, Sonoran pronghorn, and monarch butterfly occur or are likely to occur in the analysis area in the next 10 years. Suitable habitat for the southwestern willow flycatcher does not occur within the analysis area, but exists approximately 1 mile west, and the species has been recorded within the area once in the last 10 years in riparian habitat. Relative to the No Action and Resource Protection Alternatives, the potential impacts to cactus ferruginous pygmy owl would be greatly reduced but may still include some damage to potential roosting or nesting vegetation, roosting or nesting habitat avoidance, and decreased forage opportunities. Less grazing would reduce the impacts to Sonoran pronghorn. Soil degradation or changes in vegetation communities may occur but should be reduced. Competition for forage resources, competition for preferred thermal cover, avoidance of areas where livestock are present, disease transmission, entanglement and increased risk of predation from existing fencing, and increased human presence associated with cattle management would also be reduced. Potential impacts to monarch butterfly would include possible mortality and injury through trampling, reduced availability of forage and breeding vegetation, and habitat alteration, but it is unlikely to be consistent from year-to-year since the restrictions on ephemeral grazing would reduce grazing impacts. Potential impacts to southwestern willow flycatcher would not be expected as no grazing would be allowed within the Northwest pasture, which would exclude livestock from accessing any riparian areas. The additional terms and conditions under this alternative are thereby expected to decrease the likelihood and severity of potential impacts to these species.

The Gila River on the northern border of the Allotments provides suitable habitat for the yellow-billed cuckoo and the Yuma Ridgway's rail. Yellow-billed cuckoos have been observed in the riparian area along the Gila River on the northern boundary of the analysis area. Yuma Ridgway's rails have not been observed in the bordering riparian area but have been observed in the last 5 years within 2 miles of the analysis area. In addition, the desert pupfish and Gila topminnow have been recorded to occur less than 3 miles from the analysis area in the Gila River and may occur in the portion of the river adjacent to the analysis area. Excluding livestock from the Northwest pasture would keep livestock from accessing riparian and aquatic habitat and ensure livestock do not impact the forage, habitat, or prey populations for these species.

The changes in terms and conditions outlined in the Ephemeral Grazing Alternative would better maintain habitat and access to forage for threatened and endangered species. Ephemeral grazing limits the frequency of livestock/wildlife interactions, especially in wash communities that serve as forage areas and movement corridors, and competition for perennial browse. Excluding livestock from sensitive areas, such as riparian and aquatic habitat, through pasture fencing, would reduce potential impacts to many species

and habitat. The Ephemeral Grazing Alternative would have fewer impacts on threatened and endangered species than the No Action or Resource Protection Alternatives, because the proposed management would make more forage resources available for wildlife, cause fewer adverse impacts to habitat, and result in fewer livestock to displace or disturb wildlife.

Under the Ephemeral Grazing Alternative, range improvements such as water developments and existing fencing would continue to be maintained by permittees in the Allotments available for livestock grazing. Wildlife would benefit from access to those water sources.

Alternative D- No Grazing Alternative

Arnold and Beloat Allotments

General Wildlife and Migratory Birds

In the absence of livestock grazing, competition between livestock and general wildlife for forage vegetation would be eliminated, providing more forage for general wildlife and more forage and habitat for insect and other potential prey populations of migratory birds and other wildlife species. The absence of livestock grazing could result in cover canopy increasing over time, benefiting cover-dependent species. Livestock disturbance and displacement effects would not occur, benefiting nesting migratory birds and other wildlife. With the absence of grazing, improvements in vegetative cover conditions would be expected to occur more rapidly. This would result in a potential benefit for wildlife. An increase of herbaceous species frequency, cover, and composition would be expected to be greater under this alternative.

Allotment fencing and water developments would not be maintained by permittees. As a result, the number of maintained water sources within the analysis area is likely to decrease due to the removal of permittee maintenance contributions. Fencing hinders the movement of some wildlife species, and it is possible for wildlife to be injured on fencing. Unmaintained fencing is potentially a greater hazard to wildlife. When fence materials break and are on the ground, there is a greater potential for wildlife to become entangled. Unmaintained range improvements could result in adverse impacts on wildlife. No new range improvements would be authorized under this alternative.

BLM Sensitive Species

In the absence of livestock grazing, competition for BLM sensitive species forage vegetation would be reduced, providing more forage for BLM sensitive species, insects, and other potential prey populations for BLM sensitive species. The absence of livestock grazing could result in cover canopy increasing over time, benefiting cover-dependent species such as SDT, lowland leopard frogs, Sonoran green toads, and western burrowing owls. Livestock disturbance and displacement effects would not occur, benefiting nesting birds and other BLM sensitive species. With the absence of grazing, improvements in vegetative cover conditions would be expected to occur more rapidly. Potential soil disturbance from livestock would not occur. There would be no risk of accidental collapsing of burrows or shelters due to livestock. This would result in a potential benefit for BLM sensitive species. An increase of herbaceous species frequency, cover, and composition would be expected to be greater under this alternative. No grazing may allow more favorable conditions for the establishment or spread of already present invasive species but would limit the introduction of new invasive species. This may impact vegetation communities by reducing forage for native animal species and increasing fire risks. However, impacts from this alternative would likely result in a net benefit to BLM sensitive species. This management is expected to allow the BLM to meet, and potentially exceed, the commitments made for sensitive species in the LSFO RMP as well as those specific to Sonoran desert tortoise in the SDT CCA.

Under the No Grazing Alternative, allotment fencing and water developments would not be maintained by permittees. As a result, the number of maintained water sources within the analysis area is likely to decrease due to the removal of permittee maintenance contributions which could result in adverse effects. Unmaintained range improvements, including unmaintained fencing, may pose an entanglement risk which could result in adverse impacts to BLM sensitive species.

Threatened and Endangered Species

In the absence of livestock grazing, competition for threatened and endangered species forage vegetation would be reduced, providing more forage opportunities for threatened and endangered species and

potential prey species populations. The absence of livestock grazing could result in cover canopy increasing over time, benefiting species such as Yellow-billed cuckoo, southwestern willow flycatcher, Yuma Ridgway's Rail, and Monarch butterfly. Livestock disturbance and displacement effects would not occur, benefiting threatened and endangered species. Livestock intrusion into riparian or aquatic habitat would not occur, benefiting riparian and aquatic obligate species. With the absence of grazing, improvements in vegetative cover conditions would be expected to occur more rapidly. This would result in a potential benefit for species. An increase of herbaceous species frequency, cover, and composition would be expected to be greater under this alternative.

Under the No Grazing Alternative, allotment fencing and water developments would not be maintained by permittees. As a result, the number of maintained water sources within the analysis area is likely to decrease due to the removal of permittee maintenance contributions which could result in adverse effects. Unmaintained range improvements, including unmaintained fencing, may pose an entanglement risk which could result in adverse impacts to threatened and endangered species.

3.6 How will the proposed grazing management impact wildlife movement in corridors?

3.6.1 Affected Environment—Wildlife Movement Corridors

Wildlife Movement Corridors (WMCs) (Figure 7) are managed to provide adequate habitat to allow for wildlife movement between areas in a relatively safe manner (BLM 2012). The analysis area contains two WMC identified in the LSFO RMP: the Buckeye Hills to Gila Bend Mtns. WMC and the Estrella Mtns. to SDNM WMC (Figure 8). Many species of animals mentioned in Section 3.5 utilize these corridors including desert mule deer, javelina, mountain lion, and bighorn sheep. Though these species may have different migration and movement patterns, the proposed action may affect species in a similar manner and those impacts will be analyzed together.

The impacts of the proposed action to the WMCs are potentially restricted movement from existing fencing and habitat degradation and destruction from cattle presence. No new fencing would be approved by any of the alternatives analyzed in this EA. Any new fencing would be approved through a separate grazing decision, analyzed in a separate NEPA document. Some existing fence may pre-date the current permeability standards in the AZGFD Wildlife Compatible Guidelines (AGFD 2011a). To mitigate potential adverse effects of fencing on wildlife species, fencing is required to be constructed in a wildlife-friendly manner, including smooth strand top and bottom wires and with the bottom wire at least 18 inches from the ground. The fencing criteria help to eliminate the impacts of fencing on small species including the SDT, coyote, and the Western Diamondback rattlesnake as smaller animal movements will not be inhibited as long as the fences are maintained. Damaged and unmaintained fences may restrict small animal movements underneath the fence due to accumulation of brush and debris. Small animals would still be affected by cattle presence within the WMC. The impacts from cattle presence such as habitat destruction, degradation, fragmentation, avoidance, and reduction in forage availability within these WMC are discussed in Section 3.5.

Large game animals would also be affected by cattle presence within the WMC as discussed in Section 3.5. Required wildlife-friendly fencing may reduce impacts for ungulate species including deer, bighorn sheep, and pronghorn. Adult mule deer will typically jump over allotment fences while deer fawns, sheep, and pronghorn will go underneath the fence if there is adequate space (AGFD 2011a). Though wildlife friendly fencing is designed to be permeable for large game species, fencing that pre-dates wildlife friendly standards, damaged fencing, and fencing that is not properly maintained may cause entanglement risks, potentially injuring or killing wildlife. Damaged fencing may also increase the risk of livestock encroachment into areas where grazing is not permitted thereby leading to impacts on large game animal movement within the WMC. Fences that are not maintained may also accumulate brush and debris, ultimately inhibiting or preventing wildlife from moving underneath the bottom wire. Reducing the permeability of the fence may increase fatalities, increase travel time to desired habitat or forage, and cause habitat fragmentation.

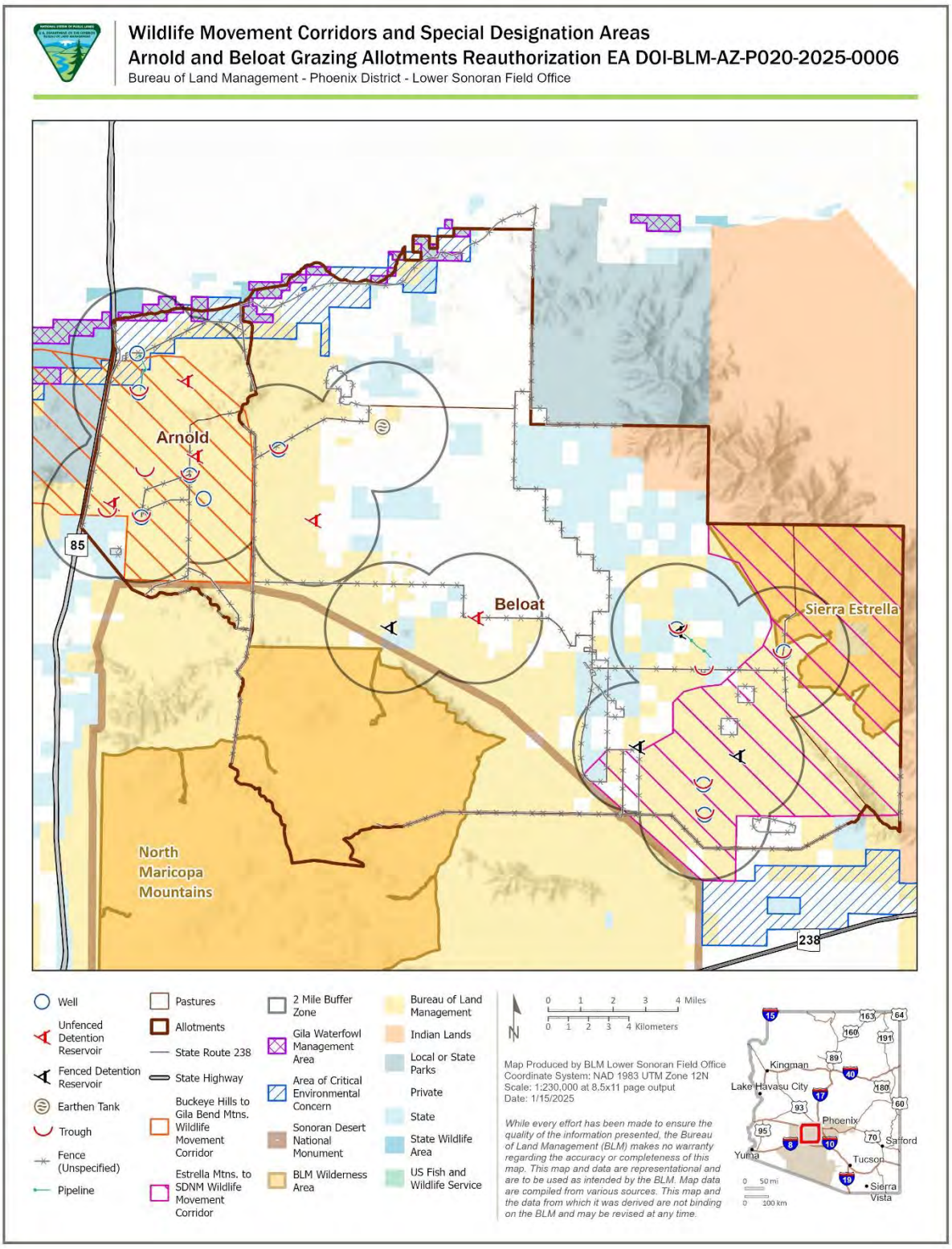

Figure 7 Wildlife movement corridors in the analysis area.

3.6.2 Environmental Impacts on Wildlife Corridors

Alternative A- No Action Alternative

Arnold and Beloat Allotment

Under the No Action Alternative, the Arnold and Beloat permits would be renewed for a period of 10 years with the same terms and conditions of the existing permits. No new fencing would be authorized under this alternative, and existing fencing would be maintained and repaired by the permit holder.

Existing fencing may not be up to current wildlife-friendly standards. There may not be adequate spacing, appropriate use of barbless wires, or proper maintenance of damaged fencing. Current fencing may inhibit or prevent permeability which may continue the risk of wildlife injuries and inhibit or prevent safe movement through the WMCs. Currently, the Arnold Allotment is ephemeral use only. In years where ephemeral use requirements are not met, livestock would be removed, which may improve safe wildlife movement through the Buckeye Hills to Gila Bend Mtns. WMC. Livestock grazing would remain authorized on the Beloat Allotment and the impacts previously discussed in Section 3.5 would be expected.

Alternative B- Resource Protection Alternative

Arnold and Beloat Allotment

Under the Resource Protection Alternative, livestock grazing would be authorized for a period of 10 years with modifications to the current terms and conditions including the non-SDNM portion of the Beloat Allotment (see 2.2.1 and 2.2.2). No new fencing would be authorized under this alternative and existing fencing would be maintained and repaired by the permit holder.

Existing fencing may not be up to current wildlife-friendly standards for the Allotments. There may not be adequate spacing, appropriate use of barbless wires, or proper maintenance of damaged fencing. Current fencing may inhibit or prevent permeability which may continue the risk of wildlife injuries and inhibit or prevent safe movement through both WMCs. The Arnold Allotment would remain in ephemeral use only, with additional terms and conditions that may further reduce cattle presence during periods of low rainfall. Reduced livestock presence may result in fewer impacts to wildlife movement through the Buckeye Hills to Gila Bend Mtns WMC.

Compared to Alternative A, the Beloat Allotment would see a reduction of authorized livestock presence, including in the Estrella and Southeast pastures which are the only two pastures in the allotment that overlap with the Estrella Mtns. to SDNM WMC. The number of authorized AUMs in the Estrella pasture would be reduced and held in suspense. Grazing would only be allowed from November 1 to March 30. The Southeast pasture, which is authorized for perennial use under current management conditions, would become ephemeral use only with additional terms and conditions. This alternative would be expected to have fewer impacts on wildlife movement within the WMCs than Alternative A.

Alternative C- Ephemeral Grazing Alternative

Arnold & Beloat Allotment

Under Alternative C, the Ephemeral Grazing Only Alternative, the Arnold and Beloat permits would be renewed for a period of 10 years with modifications to the terms and conditions, which would include the conversion of authorized grazing on the Beloat allotment to ephemeral use only.

Existing fencing may not be up to AZGFD recommended standards for the Allotments (AGFD 2011a). There may not be adequate spacing, appropriate use of barbless wires, or proper maintenance of damaged fencing. Current fencing may inhibit or prevent permeability which may continue the risk of wildlife injuries and inhibit or prevent safe movement through both WMCs. Alternative C would require the Allotments to be ephemeral use only. In years where ephemeral use requirements are not met, ephemeral grazing would not be approved, which may improve safe wildlife movement through both WMCs. This alternative would have fewer impacts on WMCs than both Alternatives A and B.

Alternative D- No Grazing Alternative

Arnold & Beloat Allotment

Under the No Grazing alternative, the BLM would not authorize grazing on the Arnold and Beloat Allotments, for a period of 10 years, on the BLM-managed lands both inside and outside of the SDNM boundary. Grazing on private lands and on Arizona State Trust Land leases is expected to continue at current stocking rates adjacent to the SDNM within the Allotments.

Allotment fencing would not be maintained by permittees. If fencing is not removed, unmaintained fencing may pose a potential hazard to wildlife. When fence materials break and are on the ground, there is a greater potential for wildlife to become entangled. As such, unmaintained range improvements that are not removed could result in adverse impacts to wildlife movement within the WMCs.

Eliminating grazing would eliminate the presence of livestock within the WMCs and thus there would be no impacts from expected from livestock presence. Alternative D would best accommodate wildlife movement within both WMCs.

3.7 How will Grazing Impact Local Air Quality and Climate Change?

3.7.1 Affected Environment: Climate Background

The analysis area exhibits a bi-modal precipitation seasonality that is characteristic of southern Arizona. During winter and spring, frontal storm systems move west-to-east guided by the jet stream. Summer monsoon thunderstorms also deliver significant amounts of precipitation to the area. The analysis area, like the majority of southern Arizona, exhibits strong year-to-year variations in precipitation due to El Niño-Southern oscillations, with wet periods followed by dry periods. Precipitation data were obtained from the Maricopa County Flood Control District rain gauges. There are four gauges within the boundaries of the Beloat Allotment. Though there is no weather station in the Arnold Allotment, there is one located 0.25 miles from the southeastern boundary of the allotment. The best representation of likely precipitation in the southeastern portion of the Beloat Allotment where it intersects the SDNM is located 1.2 miles south of the Beloat Allotment.

Though there are six rain gauges currently, only one includes forty years of data (locations mapped in Figure 2 and 3). The Waterman Wash station (84000) has collected data since the summer of 1983. The other five locations were established between 1988 and 2000 (Table 15). Five of the six weather stations are located within the allotment, but none are close to the SDNM or North Maricopa Wilderness Area. Though located south of the Beloat Allotment, the Upper Waterman Wash weather station (84500) may better characterize climate in the southwestern portion of the Beloat Allotment. Data on precipitation was summarized using the first available complete rain year (October-September). Precipitation has shifted during the 2004-2023 period with less rain in the winter and more monsoonal moisture than during the 1984-2003 period (Figure 8). According to the weather stations within the allotments (five stations) rain has decreased 0.35 inches. However, if you included the Upper Waterman Wash rain gauge just south of the Beloat Allotment, the decrease in precipitation for the analysis area was negligible (0.02 inches).

The Estrella Fan weather station includes a temperature sensor (84201). Monthly temperatures are lowest in December (55.8°F) and warmest in July (95.4°F) (Figure 9). Annual averages for 2002 to 2024 were available for analysis. Between 2002 and 2006, annual temperature was relatively similar. Starting in 2007 the annual temperature trend has increased albeit in a highly variable way. The general trend suggests that annual temperature has increased by 2°F between 2002 and 2024, though the actual change within any single year varies considerably. In 2019, the annual average temperature was the lowest recorded (74.5°F), but 2020 was the highest recorded annual average (79.5°F) (Figure 10). Assuming little to no change in precipitation in the action area (Figure 8), evapotranspiration stress has increased

Table 15 Weather stations used in the Environmental Assessment climate analysis.

Station Name	Station Number	Established	Location	Latitude	Longitude
Waterman Wash	84000	May 1983	Beloat- northeast pasture, south	33.22337	-112.30952
Upper Waterman Wash	84500	Jun 1988	1.25 miles south of Beloat Allotment	33.09924	-112.43545
Estrella Fan	84200	Nov 1992	Beloat- northeast pasture, north	33.26949	-112.32091
Tuthill @ Ray Road	83500	Dec 1995	Beloat- northwest pasture	33.32001	-112.48295
Waterman Wash @ Rainbow Valley Rd	83300	Mar 1999	Beloat- western pasture	33.26173	-112.44404
Rainbow Wash	42800	Nov 2000	0.25 miles southeast of Arnold	33.23556	-112.63917

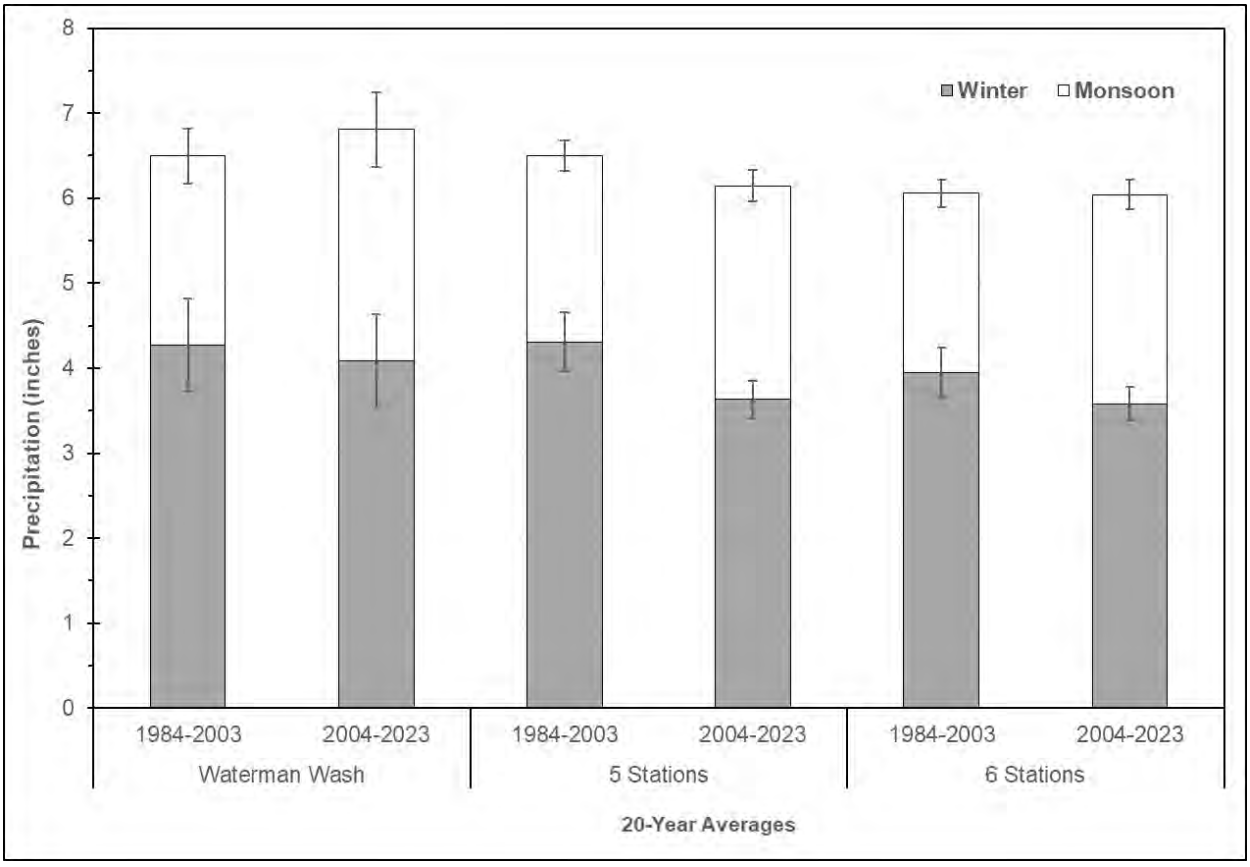

Figure 8 The annual average precipitation broken down by winter and monsoon moisture (± standard error). The Five Stations data excludes the Upper Waterman Wash station (84500) which is the furthest from the planning area. The six Stations, data includes Upper Waterman Wash and shows only 0.02-inch decrease. Upper Waterman Wash precipitation likely represents the SDNM portion of the Beloat Allotment.

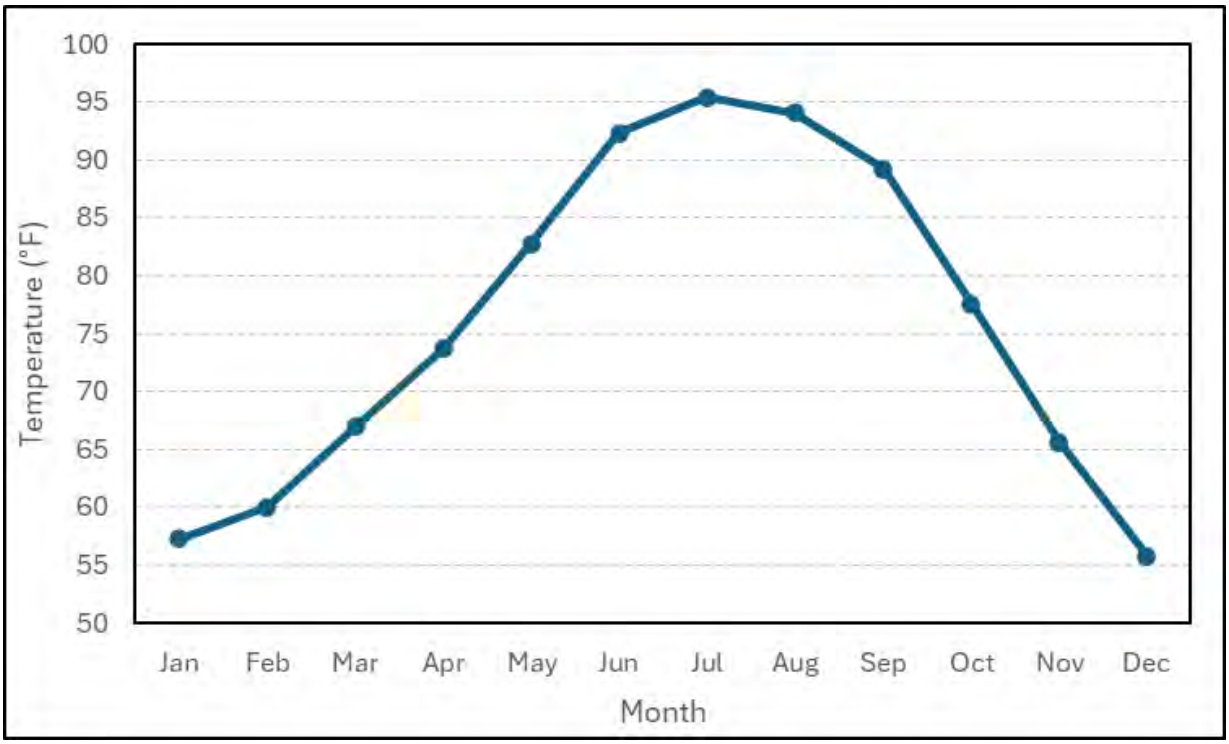

Figure 9 Monthly average temperature between 2002 and 2022 at the Estrella Fan temperature sensor (84201).

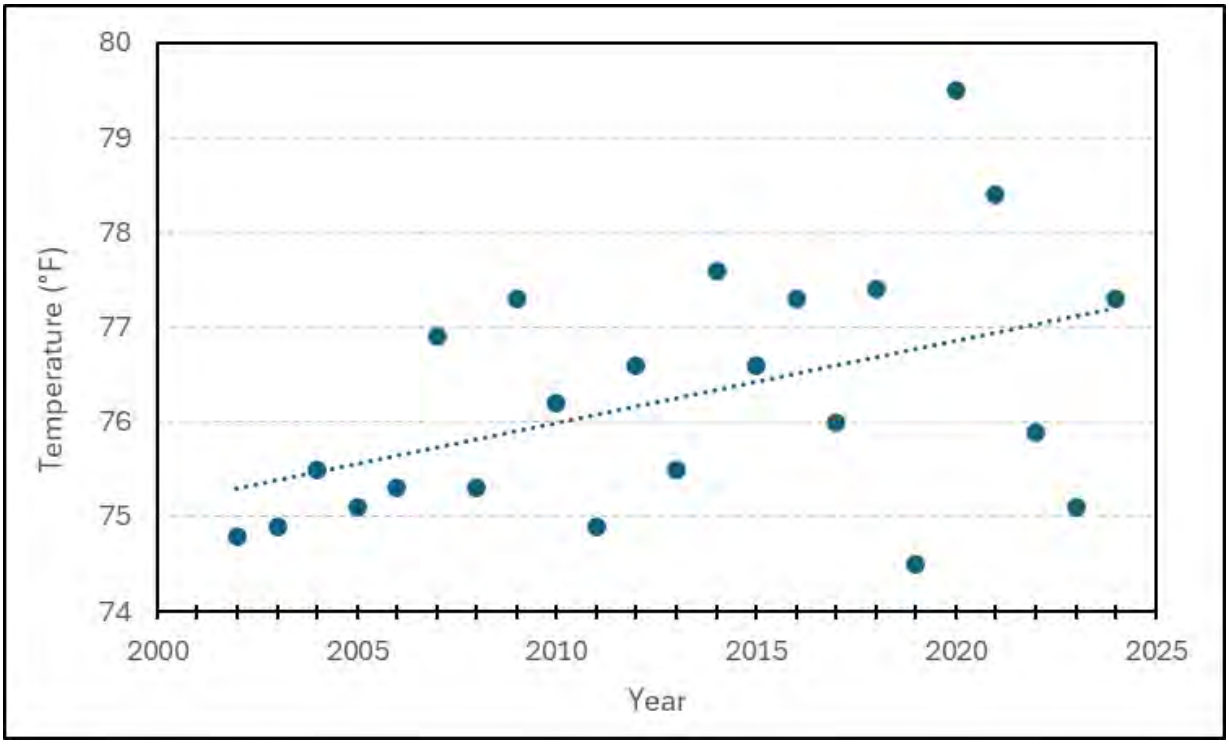

Figure 10 Annual average temperature between 2002 and 2024 at the Estrella Fan temperature sensor (84201). The trend suggests a two degree increase during the 22-year period.

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3.7.2 Affected Environment: Air Quality and Climate Change

This analysis incorporates by reference the analysis and citations used in the SDNM Grazing RMPA EA Air Resources section (BLM 2024, Section 3.10, pages 45-48). The discussion below expands on that analysis by presenting allotment specific data from the whole of each allotment.

Non-attainment areas overlapping the analysis area are associated with the Phoenix metropolitan area, an area with a population of more than four million people. The Phoenix metropolitan area is within Maricopa County which is the fourth most populous county in the US. Portions of the Arnold and Beloat Allotments are within non-attainment for large particulates (PM10). Primary pollution sources of PM10 contributing to this non-attainment are windblown dust from construction sites, agricultural fields, unpaved roads and parking lots, and disturbed vacant lots.

The Allotments are open to vehicles that use dirt roads to access recreational opportunities (e.g., target shooting, off-road vehicles, hunting) which contributes PM, CO, CO_2, SO_2, NO_2, and O_3. Bare ground in the Sonoran Solar ROW may also contribute to dust in the air in the Action Area. For an extended discussion of the effect of cattle on air quality, the BLM tiers to and incorporates by reference the analysis in section 3.10, in the SDNM Grazing RMPA EA (BLM 2024).

Greenhouse gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), water vapor, and several trace gases. Greenhouse gases collect in the atmosphere and insulate the planet and has contributed to the altered climate the United States has experienced in recent decades. From 1990 to 2000, Arizona's greenhouse gas emissions rose 51 percent compared with a national GHG emissions increase of 23 percent (BLM 2018). The average temperature in the Southwest has increased approximately 1.5°F (0.83°C) above a baseline period of 1960-1990 and is projected to rise 4.0-10.0°F (2.2°C-5.6°C) by the end of the century (BLM 2012). Methane is produced by ruminants, including livestock, from the consumption of vegetation. Methane is a gas that contributes 28 times more impact on warming than CO_2 (EPA 2024). A single cow produces 154 to 264 pounds of CH_4 per year (EPA 2024). The amount of CH_4 cattle produce is dependent on age (DeRamus et al. 2003), the plant matter they consume (Harper et al. 1999, Beauchemin & McGinn 2005, Richmond et al. 2015), time of year (DeRamus et al. 2003, Richmond et al. 2015), familiarity with digesting local plants (Raynor et al. 2024), average daily weight gain (DeRamus et al. 2003, Richmond et al 2015, Raynor et al. 2024), and management practices (DeRamus et al. 2003).

The 2024 SDNM Grazing RMPA EA (DOI-BLM-AZ-P040-2024-0001-RMP-EA) includes additional information on the impact of cattle grazing on climate change in the air quality sections 3.10 and 4.12 (pages 45-48 and 71-73). The RMPA EA discusses the impact of climate change on vegetation in sections 3.6 and 4.8 (pages 24-30 and 62-63), soils in sections 3.8 and 4.10 (pages 37-41, 66-69), and livestock grazing in section 4.5 (pages 57-59).

Arnold Allotment

The PM10 sources on the Arnold Allotment include two gravel recovery operations leased on the BLM managed lands and another on private land to the north near the Gila River. The landfill is less than 0.5 miles from the southeastern boundary and presents another source of dust particles. All the roads within the allotment are unpaved and Komatke Road is frequently used for access to hills used for recreational target shooting and for access to the Sonoran Desert National Monument.

Beloat Allotment

Abandoned agricultural fields in the Southeast Pasture are a source of dust and PM10. Tilling on active farmland in the Western Pasture is a source of seasonal dust. The Northwest Pasture includes private, suburban housing. Travel to and from those homes by their residents and others contributes to the air pollution caused by automobiles in the allotment.

3.7.3 Environmental Impacts on Air Quality and Climate Change

Transportation associated with adding or removing cattle from the Allotments and from transporting materials for maintaining infrastructure and monitoring cattle are sources of both local air pollutants and greenhouse gases, including PM, CO, CO_2, SO_2, NO_2, and O_3. Transportation for moving cattle may be similar for all alternatives since it is assumed cattle would need to be moved using the non-BLM managed lands to raise cattle. However, thinning vegetation can result in less CO_2 and PM2.5 being released by wildfires (Ratcliff et al. 2023).

Given the uncertainty in rancher decisions and actions in the absence of access to federal land, further analysis, including any differential analysis of emissions across alternatives or between the Allotments, of the emissions associated with any of the alternatives would be speculative.

Cattle grazing can thin vegetation and reduce fuels buildup decreasing the risk of wildfires and the resulting release of CO_2 and PM2.5, potentially compensating for CH_4 emissions from cattle (Ratcliff et al. 2023). With the increased risk of ignition from *Schismus* (Fusco et al. 2019), grazing could be a net benefit in terms of greenhouse gas emissions. The No Grazing Alternative would result in a buildup of fuels, thereby increasing the risk of wildfire, which may result in more greenhouse gas emissions than any of the alternatives that allow for continued grazing.

Table 16 Estimated methane production of cattle grazing on federal land for each alternative. Ephemeral grazing varies considerablly from year to year, with many years having no ephermal grazing. Because the number of cattle is unpredictable, no reasonable quantified estimate of methane emissions associated with ephemeral grazing could be made.

Grazing Management	Cattle (n)	Total Methane Low (tonne/year)	Total Methane High (tonne/year)
Alternative A (No Action)	287	20.05	34.37
Alternaive B (Reduced Grazing)	59	4.12	7.07
Alternative C (Ephemeral Only)	0	0.00	0.00
Alternative D (No Grazing)	0	0.00	0.00

It is unclear whether producers may shift any or all the cattle removed from public land under alternatives B, C, and D to private land. If producers retain the same number of cattle, then reductions in grazing levels on federal land may not change the net CH_4 emissions (Harper et al. 1999, DeRamus et al. 2003, Beauchemin & McGinn 2005, Richmond et al. 2015). Due to the complexity in determining methane production and uncertainty about producer actions and cattle management (see section 3.7.2), assumptions about the differences in cattle CH_4 production on public versus private lands would be highly speculative. However, the BLM estimated the potential carbon emissions produced on Federal Lands by the number of cattle estimated will be permitted under each alternative (Table 16). However, for the reasons noted above, the total greenhouse gas emissions may be unchanged, greater, or lower for any of the alternatives, depending on the extent to which cattle move from grazing on public lands to grazing on private lands. The uncertainty makes predicting the extent of greenhouse gas emissions for each alternative and the associated impact to climate change too speculative to lend itself to further meaningful analysis.

4 PAST, PRESENT AND FORESEEABLE FUTURE EFFECTS

This EA considers past, present, and reasonably foreseeable future actions to the extent that they are relevant and useful in analyzing whether the effects of the alternatives may have an additive and significant relationship to those actions. Only those resources or issues directly or indirectly affected by the alternatives and so analyzed in detail in Chapter 3 are considered in the past, present, and foreseeable future effects analysis here in Chapter 4.

4.1 GEOGRAPHIC SCOPE

The Effects Study Area (Study Area) for past, present and foreseeable future effect to all resources, is approximately 388,666 acres of BLM-administered, Arizona State Land Department, and privately-owned lands (Figure 11). This Study Area consists of the two livestock grazing allotments and the Kirian, Palo Verde Mountains, and Powers Butte Allotments. The Gila River serves as the northern and western boundary of this Study Area. Rainbow Valley and the Sierra-Estrella Mountains are located in the northeastern portion of this Study Area. Interstate 8 serves as the southern boundary of this Study Area.

4.2 TIMEFRAME OF EFFECTS

Individual grazing permits are valid for 10 years, but grazing may continue beyond that if authorizations are renewed. In recent years, the Lower Sonoran Field Office has received numerous applications for solar energy development on land adjacent to the Sonoran Desert National Monument. Those rights-of-way are 30-year authorizations that often include an option to renew. Impacts on biotic crusts from overgrazing by sheep during a drought persist 50 years after the end of grazing (Duniway et al. 2018). Due to the potential for long-term impacts resulting from cattle and the rights-of-way applications, the timeframe for effects analyzed here is 50 years.

4.3 PAST AND PRESENT ACTIONS

The Study Area includes lands owned or managed by the BLM, Arizona State Land Department, other federal agencies including tribal lands, and private individuals or entities. The BLM-administered lands make up approximately 181,437 acres (46.7%) of the Study Area.

On the non-BLM administered lands within the Study Area, past and present actions include agriculture; low-density residential development; and small communities on private lands such as Gila Bend (population 1,922). Interstate, state highways (State Route 85), county roads, overhead transmission lines, and underground natural gas pipelines are examples of transportation and energy infrastructures within the Study Area. A portion of the Gila River Indian Reservation and Ak-Chin Indian Community are located within the northeastern portion of this Study Area. Maricopa County Department of Parks and Recreation operates the Estrella Mountains Regional Park in the northern portion of this Study Area and the Buckeye Hills Recreation Area in the northwestern corner of this Study Area. In the Beloat Allotment, there are four wildlife water catchments maintained by the AZGFD.

On the BLM-administered lands north of State Route 238, past and present actions include rights-of-ways for overhead transmission lines and underground natural gas pipelines; exploration and mining on unpatented mining claims; county-maintained roads; the BLM travel routes ranging from single-track trails to bladed dirt and gravel roads; and permitted livestock grazing on three allotments. There are approximately 129 miles of allotment fencing on BLM-administered lands. Uses outside of the SDNM and north of State Route 238 on the BLM-administered lands include non-motorized trails for hiking and equestrian use, travel routes for motorcycles and motor vehicles, dispersed camping, hunting, and recreational target shooting. In 2018, the BLM approved a 250-foot right-of-way for the Sonoran Valley

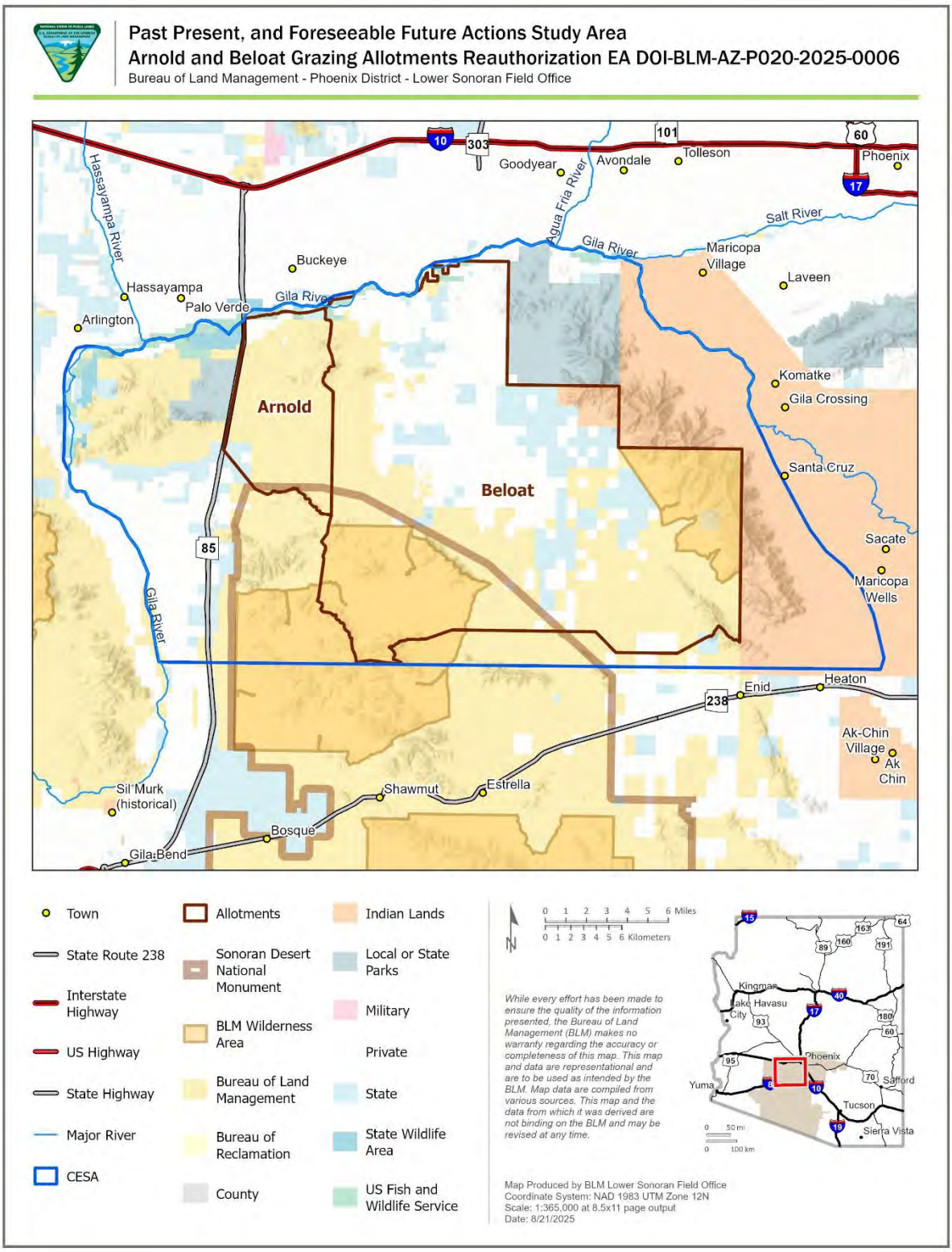

Figure 11 The Effects Study Area ("Study Area") is highlighted in blue.

Parkway (DOI-BLM-AZ-P020-2012-0001-EIS). This corridor resides outside and along the northeastern corner of the SDNM, connecting the communities of Goodyear and Maricopa with a 15- to 18-mile long, two- to six-lane parkway. Construction of the Sonoran Valley Parkway would impact approximately 472 acres of BLM and non-BLM lands. The timing of construction of the initial two-lane highway by the City of Maricopa is unknown.

On the BLM-administered lands past and present actions include rights-of-ways for I-8 and overhead transmission lines along the I-8 corridor; and rights-of-ways for Maricopa Road/SR-238 through the SDNM. In 2012 the BLM completed a travel management plan for the SDNM which designated travel routes as open, limited or closed. Uses inside the SDNM and north of I-8 include non-motorized trails for hiking and equestrian use, travel routes for motorcycles and motor vehicles, dispersed camping, hunting, and recreational target shooting.

There are three special recreation permits for recreational activities within the Study Area. In June 2008 the BLM temporarily closed approximately 88 miles of routes within the Juan Bautista de Anza Recreation Management Zone (Anza RMZ). The BLM approved the Juan Bautista de Anza RMZ Project, which authorized the construction of three recreation developments within the SDNM: Butterfield Recreation Area, Sierra-Estrella Wayside Recreation Area, and Christmas Group Camp Recreation Area (DOI-BLM-AZ-P040-2015-0002-EA; DOI-BLM-AZ-P040-2021-0001-DNA). Construction of these recreation areas would impact approximately 20 acres of BLM-administered lands. Approximately 57 miles of routes closed in 2008 would also be re-opened as a part of these developments. Construction of the Sierra-Estrella Wayside Recreation Area began in 2023 and was completed in 2024.

In 2018 the BLM approved the SDNM Target Shooting RMPA/ROD (DOI-BLM-AZ-P040-2016-0001-RMP-EIS), which closed approximately 52,000 acres of the Anza RMZ area to dispersed recreational target shooting. A complaint on the ROD was filed in U.S. District Court in 2020. The 2024 SDNM Target Shooting RMPA restricts recreation target shooting to less than 1% of the SDNM, however, that 1% needs to be surveyed to determine if target shooting would have additional adverse impacts to culturally significant resources by being allowed (BLM 2024b). A complaint was filed in 2025 in response to the 2024 SDNM Target Shooting RMP Amendment and the BLM requested the Decision Record for the RMPA EA be remanded to BLM for further analysis and consideration. The BLM is currently working on reanalyzing the decision.

In 2023, Box Canyon Recreational shooting sport site, located south of State Route 238 was opened to provide a developed recreation opportunity for the public. In fiscal year 2019 the BLM recorded 20,508 recreation visits to the northern portion of the SDNM based on traffic counts where they exist. Within the SDNM, there are 14 wildlife water catchments maintained by the AZGFD.

4.4 RECENT AND FORESEEABLE FUTURE ACTIONS

Reasonably foreseeable future actions are actions that are known or could reasonably be anticipated to occur within the Study Area (Figures 10-12). They include actions that have existing decisions, funding, formal proposals, or that are highly probable.

On the non-BLM administered lands within the Study Area, foreseeable actions include continued population growth, housing and commercial development, and agricultural use. Development of energy and transportation infrastructure, especially along the urban fringe adjacent to BLM-administered lands, is anticipated to continue into the foreseeable future. Areas of growth within the Study Area include Rainbow Valley in the northeast, and Gila Bend in the southwest. Livestock grazing and maintenance of range improvements would be expected to occur in the future.

On the BLM-administered lands outside the SDNM and north of I-8, foreseeable actions include renewal of existing authorizations for utility rights-of-ways, livestock grazing (including maintenance of range improvements), exploration on unpatented mining claims, dispersed recreational activities, and construction of the Sonoran Valley Parkway.

The I-11 corridor study area stretches 280 miles from Nogales to Wickenburg, Arizona, and construction of I-11 may affect the BLM and non-BLM lands in the Rainbow Valley area, northeast of the SDNM in the Study Area. The I-11 corridor study area varies in width from approximately 10 to 25 miles. The Arizona

Department of Transportation and Federal Highway Administration prepared a Draft Environmental Impact Statement that was made available for public input in mid-2019. The timeframe to select a corridor and implement a decision is unknown. Construction of I-11 and the Sonoran Valley Parkway are reasonably certain to occur although the timeframes for their construction are unknown. There is a possibility that these two highway projects would be combined.

On the BLM-administered lands within the SDNM and north of I-8, foreseeable future actions include renewal of existing authorizations for utility rights-of-ways, dispersed camping, hunting, hiking, and recreational target shooting. Construction of recreation developments in the Anza Recreation Management Zone was completed in 2024, and the Butterfield Recreation Area and Christmas Group Camp Recreation Area will be completed in future phases.

A number of solar project applications have been submitted through the Lower Sonoran Field Office, including within the Study Area. Close out of the construction of Sonoran Solar is anticipated prior to the end of 2025. Applications for two additional solar projects are being considered within the boundary of the Beloat Allotment (Figure 12). The Mariposa Solar project extends from the Northeast to the Southeast pasture, and the BLM anticipates beginning the analysis under NEPA in FY 2026. The Solstice Solar project would be sited in the Northeast Pasture.

4.5 WHAT IS THE EFFECT OF THE PROPOSED ALTERNATIVES WHEN COMBINED WITH THE PAST, PRESENT, AND FORESEEABLE FUTURE ACTIONS ON LAND HEALTH?

4.5.1 Standard 1 Soils and Landform

Past, present, and foreseeable future Impacts Common to All Alternatives

Construction of solar developments proposed within the Study Area would increase the risk of soil erosion by more than three times the impact of livestock grazing (Jeong & Dorn 2018). Climate change and drought may alter the composition of vegetation communities, potentially reduce soil protecting canopy structure, and alter biologic crust communities like disturbance (Ferrenberg 2015), but the result may be community dependent (Steven 2015). Soil type can also influence the impact of disturbance on soil biotic crusts (Duniway et al. 2018) suggesting crusts on some soils are at more risk than others. Additional analysis of the impact of climate change on soils and biotic crusts may be found in sections 3.8 and 4.10 of the 2024 SDNM Grazing RMPA EA (DOI-BLM-AZ-P040-2024-0001-RMP-EA) (pages 37-41, 66-69). Clearing for road construction and maintenance of roads and linear rights-of-way increases soil erosion by more than three times the impact of livestock grazing (Jeong & Dorn 2018). Given those facts, the acreage associated with proposed utility scale solar development in the study area may result in an increase in sedimentation within washes and wind eroded soils (Jeong & Dorn 2019). Solar development in this region of Arizona has, to date, primarily resulted in clearing vegetation and grazing the soil surface and would likely have similar effects to building and road development resulting in sedimentation increases along ephemeral washes downstream from solar projects. Breaking up soil crusts and removing desert pavement and other vegetation may contribute to short to moderate term increases in soil erosion caused by wind and water. The SDNM is at a higher elevation than most of the surrounding proposed solar development, so the sedimentation from water erosion is unlikely to impact the SDNM, but wind erosion could blow additional sediment into the SDNM.

The Sonoran Valley Parkway is an approved right-of-way and is planned for construction in Rainbow Valley in the foreseeable future. Construction of the Parkway would cause soil disturbance to approximately 472 acres. Developed recreational facilities will be constructed within the Juan Bautista de Anza RMZ of the SDNM, which would increase recreational opportunities and would increase the potential for soil damage from motor vehicle use and camping.

Fire in the Sonoran Desert is rare but becoming more frequent. Two wildfires occurred within the SDNM in 2024 and another four occurred within 3 miles of the SDNM boundary. Wildfire reduces soil aggregate stability, increasing soil and micronutrient loss, and increases soil compaction (Morra et al. 2024) for at least two years after a fire. The increased use of public lands since Covid-19 has resulted in more

damage from off-road vehicles and increased chance of fire ignition. Clearing and construction for solar developments and expanding suburban development, OHV use, and risk of wildfire in the planning area are expected to have greater impacts on soils than some grazing management options (Jeong & Dorn 2019).

Alternative A (No Action)

Under the No Action Alternative, soils may be damaged by livestock through trampling and removal of vegetation when compared to the other alternatives due to the greater numbers of cattle and amount of use. Soil resources may also be at risk from conversion of open, vegetated space to the construction of residential and commercial developments on private lands. Further aridification caused by climate change and long-term drought could exacerbate plant mortality when combined with stress associated with perennial cattle grazing. Perennial cattle grazing could reduce biotic crusts and disturb desert pavement that could ultimately lead to greater wind or water erosion resulting from the anticipated increase in severe storms.

Alternative B (Resource Protection)

Under the Resource Protection Alternative, 84.9% fewer perennial AUMs would mean less disturbance to soils by livestock through trampling and removal of vegetation relative to Alternative A, but more disturbance than Alternatives C and D. Soil resources are also at risk from conversion of open, vegetated space to the construction of residential and commercial developments on private lands. Though climate change could increase the risk of plant mortality if overgrazed, the Resource Protection Alternative mitigates the risk by only grazing in years with normal or above normal precipitation in the Arnold Allotment. Alternative B also converts the most heavily impacted pastures, West and Southeast, to ephemeral grazing with the same conditions as the Arnold Allotment. Further, the pasture with the most the BLM administered land that includes the SDNM would also be converted to ephemeral grazing. Grazing in the Estrella pasture would only occur in November through March, further reducing the risk of overgrazing relative to the No Action Alternative. Alternative B would reduce the number of cattle in drought years and the corresponding hoof disturbance to soils, impact to biotic crusts, and greater plant cover to protect soils from erosion relative to the No Action Alternative. Perennial cattle grazing may reduce biotic crusts and disturb desert pavement that could ultimately lead to greater wind or water erosion resulting from the anticipated increase in severe storms.

Alternative C (Ephemeral Only)

Under the Ephemeral Grazing Alternative, there would be no perennial AUMs. The amount of potential disturbance to soil from livestock trampling and removal of vegetation would be substantially less than Alternative A, slightly less than Alternative B, and more than Alternative D. The bulk of soil disturbance would come from recreation activities and conversion of open, vegetated space to the construction of residential and commercial developments on private lands and potential solar rights-of-way. Though climate change may increase the risk of plant mortality, the Ephemeral Only Alternative mitigates the risk by only allowing grazing in years with normal or above normal precipitation and restricting grazing to cooler months. The Ephemeral Only Alternative would reduce the number of cattle in drought years and the corresponding hoof disturbance to soils and impact to biotic crusts. The Ephemeral Only Alternative would result in greater plant cover to protect soils from erosion, relative to the No Action Alternative. Ephemeral grazing occurs in the winter when soil biotic crusts are least at risk. The disturbance to desert pavement is also minimized by the reduction in grazing pressure.

Alternative D (No Grazing)

Under the No Grazing Alternative, soils would not be impacted by cattle grazing. Instead, the sole impact would come from recreation and development on private and federal lands. Fuels from annual plants would build up as the vegetation is released from herbivore pressure. The control of fuels built up from the annual plants would be relaxed which may increase the risk of fire in this alternative relative to Alternatives A, B, and C. If the increased fuels lead to wildfire, there would likely be soil loss resulting from wind and water erosion.

Table 17 Present and reasonably foreseeable solar projects in proximity to the Study Area. The size and location of solar projects are subject to change.

Project	Location Description (Township, Range, Section)	Total Project Acreage	Description	Status
Sonoran	T2S, R2W-S7, 18, 19, 29, 30 T2S, R3W-S12-16, 20-27 T2S, R4W-S24-26	3341	260MW solar photovoltaic facility with 260 MW battery storage facility.	Completed
Mariposa	T3S, R1W-S3, 4, 11-14, 22, 23, 26, 27, 34, 35	5391	350MW alternating current solar photovoltaic facility and energy storage facility	Pre-NEPA
Solstice	T2S, R1W-S25-27, 34, 35 T3S, R1W-S1, 12	2720	Proposed alternating current photovoltaic facility.	Application submitted

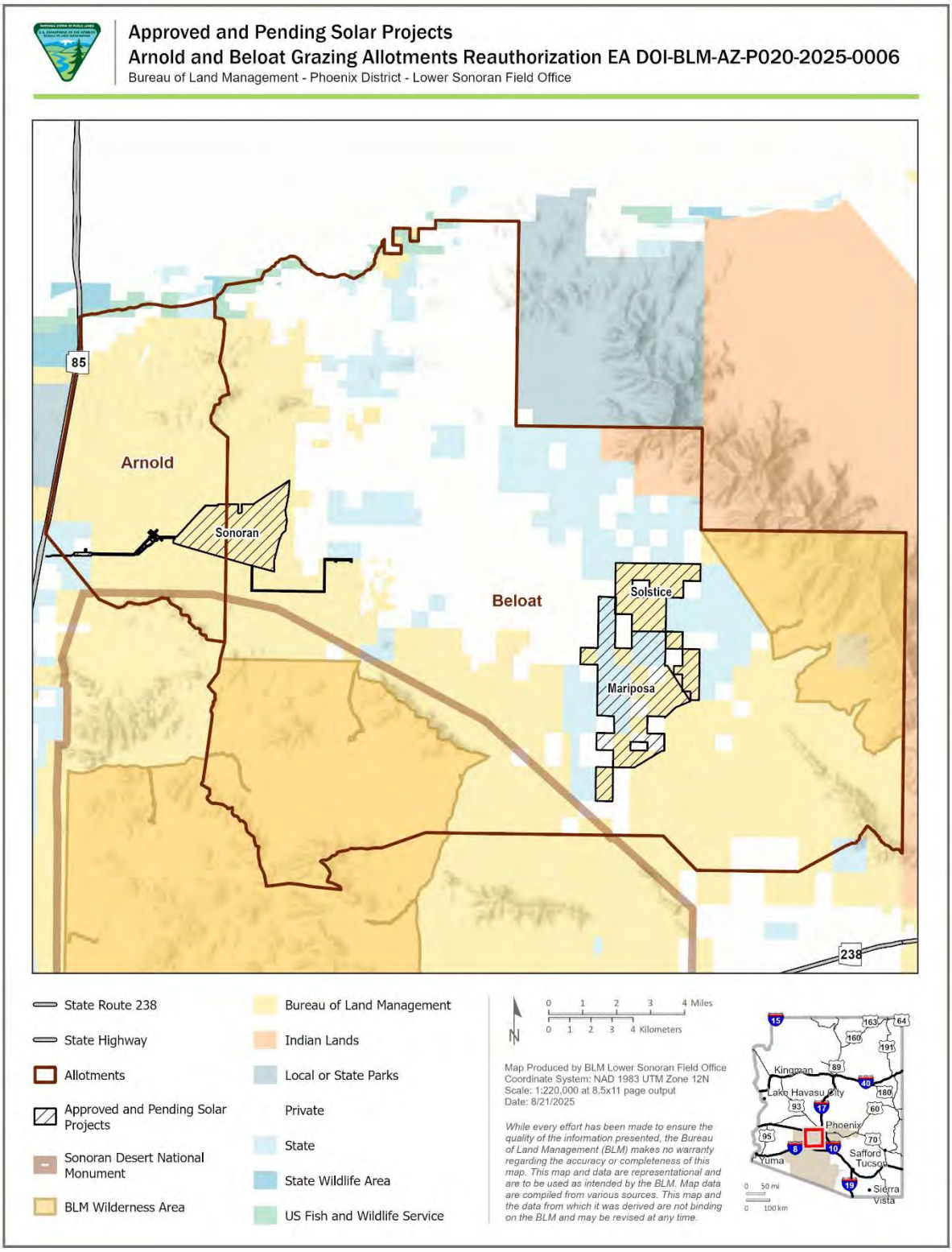

Figure 12 The locations of built (Sonoran) and proposed utility scale solar projects (Mariposa and Solstice) in the project area. A full-sized map 508 compliant map is available in the document section of the EA website (https://eplanning.blm.gov/eplanning-ui/project/2036119/510).

4.5.2 Standard 3: Desired Resource Conditions- Plant Community

Past, present, and foreseeable future Impacts Common to All Alternatives

Vegetation and soils in the Study Area (Figure 10) are currently impacted by activities such as urban sprawl, recreational activities, unauthorized livestock grazing, climate change, agricultural developments, utility and road rights-of-way, mining operations, and utility scale solar development. Urban sprawl, primarily in the northern and eastern portions of the Study Area is likely to increase in the foreseeable future. In addition, the potential solar development in the east and northeast increases the amount of potential disturbance area. Since 2020, public lands have seen increased visitation as people rediscovered recreation on public lands following the Covid pandemic.

There is increased disturbance from home construction on private lands and recreation, and utility scale solar development damages and removes vegetation through clearing and the maintenance of rights-of-way. These actions are potential vectors for invasive plant species introduction and subsequent establishment. Once weeds are established, cattle would be potential vectors for the spread of weeds.

Climate change has resulted in shifts in Sonoran Desert plant communities. Changes in summer temperature and mean annual precipitation contribute to annual variation in the plant reflectance suggesting fewer plants or reduced plant cover during dry or hot years (Hantson et al. 2021) and have led to a shift to plant species adapted to grow during cold winter weather (Kimball et al. 2010, 2011, Angert et al. 2010). Drought and freezing are also substantial factors in saguaro population declines (Parker 1993, Pierson et al. 2013, Conver et al. 2017 Felix-Burruel et al. 2024). Declines in saguaro populations since the mid-1990s have occurred in 9 of 10 populations reviewed by Pierson et al. (2013). Cattle grazing may exacerbate and hasten population decline, but 2 of 5 grazed populations increased in plant number between 1960 and the mid-1990s while concurrent grazing occurred.

Shifts in the temperature and precipitation timing caused by climate change have benefited invasive species (Abatzoglou and Kolden 2011). Climate change is predicted to contribute to the expansion of suitable habitat for red brome (*Bromus rubens*) and Sahara Mustard (*Brassica tournefortii*) (Curtis and Bradley 2015); both are found in the analysis area. Buffelgrass's phenotypic plasticity makes it drought tolerant even when competing with an array of native vegetation (Ravi et al. 2021, Farrell et al. 2022). The modeled response of buffelgrass to climate change suggest the SDNM may continue to be suitable for buffelgrass for decades to come (de Albuququerque et al 2019). Since *Schismus barbatus* invaded lands burn more readily than adjacent, uninvaded communities (Fusco et al. 2019), controlling *Schismus* to prevent wildfires is key to protecting monument objects, particularly the plant communities.

The 2024 SDNM Grazing RMPA EA (DOI-BLM-AZ-P040-2024-0001-RMP-EA) includes additional information on the impact of cattle grazing on climate change in the air quality sections 3.10 and 4.12 (pages 45-48 and 71-73). The impact of climate change on vegetation is discussed in sections 3.6 and 4.8 (pages 24-30 and 62-63), and the impact on soils is discussed in sections 3.8 and 4.10 (pages 37-41). Solar development also threatens plant communities. Many of the recent solar projects in southern Arizona have cleared all vegetation and graded the sites prior to installing solar panels. Most of the 3,341 acres of the Sonoran Solar project has been cleared, though small patches of vegetation remain in washes that run through the project area. If vegetation removal and grading are required for the other solar projects in the Beloat Allotment, it could affect as much as 16,000 acres of vegetation.

Alternative A (No Action)

Arnold Allotment

Development of private land and solar development on public lands will not occur in the Arnold Allotment. There will continue to be locatable minerals rights-of-way in the allotment. Ephemeral grazing does not impact those operations. Ephemeral grazing is not anticipated to exacerbate the impact on vegetation communities.

Beloat Allotment
If all of the solar projects are installed, nearly half of the Southeast Pasture and almost all of the Northeast Pasture vegetation would be replaced with solar development. Approximately 7% of the Southwest Pasture may also become a solar ROW.

Vegetation in the Southeast Pasture did not meet desirable resource conditions. Though cattle grazing AUMs would be reduced accordingly as any new ROWs are approved, cattle may be more concentrated in a smaller area and remove more of the average forage than if they were spread out over a larger area. The combined effect of grazing and solar development may make it more difficult for plant communities in the Southeast pasture to recruit and establish.

Alternative B (Resource Protection)

Arnold Allotment
The impact will be the same as Alternative A, but reduced in magnitude because cattle will be limited to less forage.

Beloat Allotment
The Resource Protection Alternative would only allow perennial grazing in two pastures: Northeast and Estrella. The West and Southeast Pastures would be rested allowing plant communities to passively restore through normal ecological processes. Though solar development may occur, plant communities would not be under as much stress as under the No Action Alternative where both development and current levels of grazing in the Southeast Pasture would occur. It is possible that by the time solar development occurs, access for cattle may be restored to the Southeast Pasture. The Southeast and West Pastures would remain available for ephemeral grazing which would help control fuels from annual forbs and grasses.

Alternative C (Ephemeral Grazing)

Arnold Allotment
The impact will be the same as Alternative B, because the terms and conditions are identical.

Beloat Allotment
The Ephemeral Grazing Alternative would only allow ephemeral grazing in the Beloat Allotment. The terms and conditions of the Ephemeral Grazing would be the same as for the Arnold Allotment in Alternatives B and C. Therefore, the impact will be the same as is described above for the Arnold Allotment, Alternative B.

Alternative D (No Grazing)

Both Allotment
Though the No Grazing Alternative would remove vegetation impacts from cattle grazing, invasive species are likely to continue to expand. Since ephemeral grazing in the allotment would not be allowed, fuels from annual forbs and grasses could build and lead to increased risk of wildfire.

4.6 WHAT IS THE EFFECT OF THE PROPOSED ALTERNATIVES WHEN COMBINED WITH THE PAST, PRESENT, AND FORESEEABLE FUTURE ACTIONS ON HISTORIC CULTURAL RESOURCES?

4.6.1 Past, present, and foreseeable future Impacts Common to All Alternatives

The extent and magnitude of past, present, and foreseeable future effects from grazing to archaeological sites are largely a factor of the length of time and intensity that a site is subjected to direct and indirect effects (Horne and McFarland 1993). Larger species of wildlife such as mule deer also use vegetation within the Allotments and could potentially cause similar direct and indirect effects to archaeological sites as those caused by livestock. Direct effects consist of crushing and displacement of artifacts, chiseling in damp soils, and sloughing and collapse of streambanks, and indirect effects consist of removal of vegetation, biomass reduction, erosion, streambank destabilization, downslope transport of artifacts, and

increased visibility leading to potential artifact collection. Other uses, such as recreational off-road-vehicle use, recreational shooting, population pressure and human-caused effects from urban sprawl, rights-of-ways, and renewable energy generation and transmission, may also contribute to past, present, and foreseeable future effects. Additional information on the impact of grazing on cultural resources in the context of future foreseeable actions is described in section 4.11 of the 2024 SDNM Livestock Grazing RMPA EA (DOI-BLM-AZ-P040-2024-0001-RMP-EA) (pp 41-45, 69-71).

4.6.2 Alternative A – No Action Alternative

Under the No Action Alternative, grazing would continue under the same terms and conditions for the next ten years. The No Action Alternative, combined with past direct and indirect effects, and foreseeable future actions could result in long term, moderate impacts to archaeological resources if mitigation measures described in section 3.4.1 are not implemented and monitored yearly.

4.6.3 Alternative B – Resource Protection

Under the Resource Protection Alternative, grazing would still be available in both the Allotments. The Resource Protection Alternative, combined with past direct and indirect effects, and foreseeable future actions could result in long term, moderate impacts to archaeological resources if mitigation measures described in section 3.4.1 are not implemented and monitored yearly.

4.6.4 Alternative C – Ephemeral Grazing

Under the Ephemeral Grazing Alternative, grazing would still be available in both the Allotments. The Ephemeral Grazing Alternative, combined with past direct and indirect effects, and foreseeable future actions could result in long term, moderate impacts to archaeological resources if mitigation measures described in section 3.4.1 are not implemented and monitored yearly.

4.6.5 Alternative D – No Grazing

Under the No Grazing Alternative, grazing would still be available on State and Private lands, so past, present, and foreseeable future effects to archaeological resources could still occur within the Study Area, but not on BLM-administered lands within the Allotments.

4.7 WHAT IS THE EFFECT OF THE PROPOSED ALTERNATIVES WHEN COMBINED WITH THE PAST, PRESENT, AND FORESEEABLE FUTURE ACTIONS ON GENERAL WILDLIFE, BLM SENSITIVE SPECIES, THREATENED AND ENDANGERED SPECIES, AND MIGRATORY BIRDS?

4.7.1 Past, present, and foreseeable future Impacts Common to All Alternatives

Other activities such as recreation and continued population growth in and around the Study Area could result in a variety of impacts to wildlife, migratory birds, and special status species as well as habitat for these species. Roads and other infrastructure projects in the Study Area (Figure 11) could displace, fragment and remove habitat, and contribute to direct mortality for these species. The Sonoran Valley Parkway is an approved right-of-way and is planned for construction in Rainbow Valley in the foreseeable future (BLM, 2019). The development of solar facilities and accompanying infrastructure and fencing has the potential to restrict movement of various species into and out of the analysis area and may increase habitat fragmentation. Solar developments may introduce additional human disturbance including disturbance or removal of potential roosting, breeding, nesting, or shelter sites, and removal or reduction of available forage or forage habitat for various species. Livestock may enter the BLM managed land from adjacent State and private lands due to cut, damaged, or absent fences. The combination of solar development and livestock grazing may further restrict wildlife movement and restrict or remove access to suitable forage and habitat. Unauthorized livestock may lead to additional utilization of vegetation which would be additive to authorized livestock use, if any. Climate change and the associated long-term drought and shifts in precipitation have the potential to alter vegetation communities that make up wildlife habitat and reduce forage and water availability in these arid environments. It may also alter fire regimes

which may affect wildlife species and habitat in non-fire adapted ecosystems, such as the Sonoran Desert. (See sections 3.3 and 4.5 of this document for additional information.)

4.7.2 Alternative A (No Action)

Livestock grazing would continue within the Study Area on the BLM-administered, State, and private lands. Competition for forage between general wildlife, migratory birds, BLM sensitive species, threatened or endangered species, and livestock would continue. The reduction in forage and shrubs may also affect prey populations and concealment opportunities for wildlife, migratory birds, and special status species. Range improvements such as water developments for livestock would be maintained by permittees. Grazing, infrastructure projects including highways, and conversion of open space into residential and commercial developments within the Study Area would result in additional impacts to species.

4.7.3 Alternative B (Resource Protection)

Under the Resource Protection Alternative, livestock grazing would be available on both the Arnold and Beloat Allotments. There would be competition for forage and space between wildlife, migratory birds, BLM sensitive species, threatened and endangered species, and livestock. Range improvements such as water developments for livestock would be maintained by permittees. Grazing, infrastructure projects including highways, and conversion of open space into residential and commercial developments within the Study Area (Figure 11) would result in additional impacts to wildlife.

4.7.4 Alternative C (Ephemeral Only)

Under the Ephemeral Use Only Alternative, livestock grazing would be available on both the Arnold and Beloat Allotments. There would be seasonal competition for forage and space among wildlife, migratory birds, BLM sensitive species, threatened and endangered species, and livestock. Range improvements such as water developments for livestock would be maintained by permittees. Grazing, infrastructure projects including highways, and conversion of open space into residential and commercial developments within the ESA (Figure 11) would result in additional impacts to species.

4.7.5 Alternative D (No Grazing)

Livestock grazing would continue within the Study Area (Figure 9) on State and private lands. Under the No Grazing Alternative, livestock grazing would not be authorized on BLM-administered lands. In the absence of livestock grazing, competition for forage between species and livestock would be eliminated, which would result in more forage for wildlife, migratory birds, BLM sensitive species, and threatened and endangered species, and forage and habitat for potential prey populations for these species. The absence of livestock grazing could result in cover canopy increasing over time, a benefit for cover-dependent species. Livestock disturbance or displacement effects would not occur, benefiting nesting birds and other species that may be sensitive to the presence of livestock. The absence of grazing within the analysis area would result in a benefit to species, although as population growth continues in the Study it is highly likely that recreation in the area would increase, which would contribute to many new stressors on species. Grazing, infrastructure projects including highways, and conversion of open space into residential and commercial developments within the ESA would add additional impacts to species. Range improvements such as water developments within the analysis area would no longer be maintained by permittees. This may result in an increased entanglement risk for species.

4.8 WHAT IS THE EFFECT OF THE PROPOSED ALTERNATIVES WHEN COMBINED WITH THE PAST, PRESENT, AND FORESEEABLE FUTURE ACTIONS ON WILDLIFE MOVEMENT CORRIDORS?

4.8.1 Past, present, and foreseeable future Impacts Common to All Alternatives

Recreation and continued population growth in and around the analysis area could increase wildlife avoidance and safe movement through the Buckeye Hills to Gila Bend Mtns. and the Estrella Mtns. to SDNM WMCs. The Sonoran Solar Project is an existing renewable energy facility that partially overlaps with the Buckeye Hills to Gila Bend Mtns. WMC, and Fragrant Sage is a proposed renewable energy project that would overlap with the Estrella Mountains to SDNM WMC (Figure 12**Error! Reference**

source not found.). Solar facilities typically use 7-foot chain link security fence around the perimeter, which would inhibit or prevent large animals from moving through the project area. Most fencing requirements call for a 6- to 8-inch gap between the ground and the fence to allow permeability for smaller animal species.

4.8.2 Alternative A (No Action)

The Arnold and Beloat permits would be renewed for a period of 10 years with the same terms and conditions of the existing permits. No new fencing would be authorized under this alternative and existing fencing would be maintained and repaired by the permit holder. Existing fencing may not be up to current wildlife-friendly standards. The Sonoran Solar Project slightly overlaps the Buckeye Hills to Gila Bend Mtns. WMC within the Arnold Allotment. The Fragrant Sage Solar Project is a proposed renewable energy project that partially overlaps with the Estrella Mtns. to SDNM WMC within the Estrella pasture of the Beloat Allotment which would be authorized for perennial grazing. Recreational activities are also common for both areas. Fencing from the Sonoran Solar Project would restrict movement within the Buckeye Hills to Gila Bend Mtns. WMC within the Arnold Allotment, and the presence of livestock during ephemeral grazing periods could cause disruption or avoidance of the WMC. If ephemeral requirements are not met, then impacts to wildlife movement from livestock presence would not occur. The Estrella Mtns. to SDNM WMC may see additional impacts and restricted or negatively impacted wildlife movement due to existing and proposed solar development and the perennial nature of livestock presence within the Beloat allotment under the No Action Alternative terms and conditions.

4.8.3 Alternative B (Resource Protection)

Under the Resource Protection Alternative, livestock grazing would be renewed for a period of 10 years with modifications to the current terms and conditions, including for the non-SDNM portion of the Beloat Allotment (see 2.2.1 and 2.2.2). No new fencing would be authorized under this alternative and existing fencing would be maintained and repaired by the permit holder. The Arnold Allotment would remain available for ephemeral use only, with additional terms and conditions that may reduce livestock presence when conditions warrant, and would thereby potentially reduce livestock presence and its impacts to WMCs. Wildlife movement would still be impacted by solar development, recreation, and other future development within the Buckeye Hills to Gila Bend Mtns. WMC. The Beloat Allotment would see a reduction of authorized livestock use, which would reduce livestock presence and its impacts. Wildlife movement would still be impacted by solar development, recreation, and other future development within the Estrella Mtns. to SDNM WMC.

4.8.4 Alternative C (Ephemeral Only)

Under Alternative C, the Ephemeral Grazing Only Alternative, the Arnold and Beloat permits would be renewed for a period of 10 years with modifications to the terms and conditions, which would include the conversion of authorized grazing on the Beloat allotment to ephemeral use only. The Arnold Allotment would remain available for ephemeral use only, with additional terms and conditions that may reduce livestock presence when conditions warrant and would thereby potentially reduce livestock presence and its impacts on WMCs. Wildlife movement would still be impacted by solar development, recreation, and other future development within the Buckeye Hills to Gila Bend Mountains WMC. The Beloat Allotment would become ephemeral use only, which would reduce livestock presence and its impacts to WMCs. Additional terms and conditions that would apply might reduce livestock presence when conditions warrant and would thereby potentially further reduce livestock presence and its impacts on WMCs. Wildlife movement would still be impacted by solar development, recreation, and other future development within the Estrella Mtns. to SDNM WMC.

In years where ephemeral use requirements are not met, livestock would be removed from one or both Allotments, which might improve conditions and allow for safer and less restricted wildlife movement through both WMCs. Current fencing would be maintained with up-to-date wildlife friendly designs. Wildlife movement would still be impacted by solar development, recreation, and other future development within each WMC.

4.8.5 Alternative D (No Grazing)

Under the No Grazing alternative, the BLM would not authorize grazing on the Arnold and Beloat Allotments, for a period of 10 years, on the BLM-managed lands both inside and outside of the SDNM boundary. Grazing on private lands and on Arizona State Trust Land leases is expected to continue at current stocking rates adjacent to the SDNM within the Allotments. There would be no livestock presence to impact wildlife movement within WMCs in both Allotments on the BLM-managed land. Existing fencing would not be maintained but could potentially be removed, which would improve wildlife movement within the WMCs. Impacts from unmaintained fencing may occur if fencing is not removed (see Section 3.6.1).

4.9 WHAT IS THE EFFECT OF THE PROPOSED ALTERNATIVES WHEN COMBINED WITH THE PAST, PRESENT, AND FORESEEABLE FUTURE ACTIONS LOCAL AIR QUALITY AND CLIMATE CHANGE?

4.9.1 Past, present, and foreseeable future Impacts Common to All Alternatives

Portions of the Study Area are in non-attainment for three regulated pollutants: Ozone (O_3), large particulates (PM10), and fine particulates (PM2.5). Vehicle travel on paved roads in the Study Area represents the largest single emission source which contributes to the formation of O_3. The largest source of particulate matter emissions in the Study Area are surface-disturbing activities, including construction, mining, and off-highway (recreation-related) travel. Agricultural facilities, particularly during field tilling and harvest, also contribute to particulate emissions (Arslan and Aybek 2012, Li et al. 2013). Nationally, particulate matter and O_3 emissions decreased between 1990 and 2010, but in the Southwestern US they plateaued between 2010 and 2023 (EPA 2024a,b,c). Population in the Phoenix Metro area is predicted to increase from its 2022 population by 29.84% - 55.77% by 2050 (AZ OEO 2024). Barring technological advances, the population growth will increase O_3 and PM air pollution.

Construction associated with future solar development would result in an additional, short-term increase in dust, CO_2, O_3, sulfur, and PM. Given the number of potential projects, it is possible that episodic construction of solar facilities may continue for 10-15 years. Project sizes vary and designs and construction plans are not finalized so any estimate of their impact on air quality would be speculative. However, construction activities create triple the erosion susceptibility as livestock grazing (Jeong & Dorn 2018). In the near-term, cattle contribution to dust in the Study Area would be dwarfed by any construction activities for solar development. Solar development may result in a net decrease in CO_2 emissions once solar facilities start generating electricity if that displaces electricity presently generated by the combustion of fossil fuels.

On all lands within the Study Area, climate change and the associated drought and the shifting precipitation will alter vegetation communities (see section 0). The exact timing, changes, and intensity are unknown but are likely to include more extreme fluctuations in precipitation patterns and temperatures. Climate change is expected to create periods of drought punctuated by high rain years in the Sonoran Desert. In dry years, dust storms during high wind events will be increasingly likely as the century progresses. Burned areas contribute increased levels of dust for years after wildfires occur (Morra et al. 2024) particularly during high wind events (Hahnenberger and Nicoll 2012).

Greenhouse gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), water vapor, and several trace gases. From 1990 to 2000, Arizona's greenhouse gas emissions rose 51 percent compared with a national GHG emissions increase of 23 percent (BLM 2018). The average temperature in the Southwest has increased approximately 1.5°F (0.83°C) above a baseline period of 1960-1990 and is projected to rise 4.0-10.0°F (2.2°C-5.6°C) by the end of the century (BLM 2012b). Methane is produced by ruminants, including livestock, from the consumption of vegetation. Methane is a gas that contributes 28 times more impact on warming than CO_2 (EPA 2024). A single cow produces 154 to 264 pounds of CH_4 per year (EPA 2024). The amount of CH_4 cattle produce is dependent on age (DeRamus et al. 2003), the plant matter they consume (Harper et al. 1999, Beauchemin & McGinn 2005, Richmond et al. 2015), time of year (DeRamus et al. 2003, Richmond et al. 2015), familiarity with digesting local plants

(Raynor et al. 2024), average daily weight gain (DeRamus et al. 2003, Richmond et al 2015, Raynor et al. 2024), and management practices (DeRamus et al. 2003).

It is unclear whether the number of cattle a producer raises on private land will differ if they are allowed to graze cattle on public lands. If producers retain the same number of cattle, then reductions of grazing levels on BLM-managed land may not change the net amount of CH4 emitted. Due to the complexity in determining methane production and uncertainty about producer actions and cattle management, assumptions about the differences in cattle CH4 production on public versus private lands would be highly speculative. Regardless, thinning vegetation can reduce the risk of wildfire and thereby result in reduced CO2 and PM2.5 emissions that would otherwise be released by those wildfires, and which could more than offset any reductions in CH4 emissions from overall reduced cattle presence (Ratcliff et al. 2023).

Foreseeable future actions may include the construction of utility scale solar. If approved, this would lead to a reduction of grazing within the allotment. Though the carbon emitted by cattle may or may not change, if the electricity from those utility scale solar projects will replace electricity generated from coal or natural gas power plants, future decisions may decrease net carbon emissions.

The 2024 SDNM Grazing RMPA EA (DOI-BLM-AZ-P040-2024-0001-RMP-EA) includes additional information on the impact of cattle grazing on climate change in the Air Quality sections 3.10 and 4.12 (pages 45-48 and 71-73). The RMPA EA also discussed the impact of climate change on vegetation in sections 3.6 and 4.8 (pages 24-30 and 62-63), soils in sections 3.8 and 4.10 (pages 37-41), and livestock grazing in section 4.5 (pages 57-59).

4.9.2 Environmental Impacts on Air Quality and Climate Change

Alternative A (No Action)

Under the No Action Alternative, the Beloat Allotment would be available for perennial livestock grazing and the Arnold Allotment would be authorized for ephemeral grazing. Agricultural, residential and commercial use, and transportation are sources of dust, PM, and O_3 on non-BLM lands within the Study Area. Within the Study Area, the primary source of O_3, PM, and dust is from recreation-related motor vehicle use.

Livestock grazing would contribute to methane (CH_4) emissions on the SDNM but the difference in total CH_4 emissions produced by cattle in the Study Area would depend on whether the cattle producers raise the same number of cattle on private land and on the other management decisions discussed in Section 3.6 (Harper et al. 1999, DeRamus et al. 2003, Beauchemin & McGinn 2005, Richmond et al. 2015). Cattle forage consumption would thin fine fuels (Davies et al. 2010, Diamond et al. 2012, Davies et al. 2015). Methane produce by cattle could be offset by reduced CO_2 and PM2.5 emissions if grazing were to prevent wildfires that would otherwise occur (Ratcliff et al. 2023).

Alternative B (Resource Protection)

The past, present, and foreseeable future effects of Alternative B would be similar to those of Alternative A. However, because there would be an 84.9% reduction in perennial AUMs, relative to Alternative A, there would be more vegetation to absorb CO_2. This would improve air quality to some extent. Cattle forage consumption would thin fine fuels (Davies et al. 2010, Diamond et al. 2012, Davies et al. 2015). Methane produce by cattle could be offset by reduced CO_2 and PM2.5 emissions if grazing were to prevent wildfires that would otherwise occur (Ratcliff et al. 2023).

Without knowing how far a permittee would need to drive to private land for grazing, it is unclear how much other carbon emissions would differ. This makes predicting the amount of net carbon emissions for each alternative, and so each alternative's contribution to cumulative effects on climate change, difficult to predict. Net carbon emissions may be unchanged, greater, or lower for any of the alternatives.

Alternative C (Ephemeral Grazing)

The past, present, and foreseeable future effects of Alternative C would be similar to those of Alternative B. However, because perennial AUMs are eliminated, there would be more vegetation to absorb CO_2 relative to Alternative A or B. This would improve air quality to some extent. Cattle forage consumption would thin fine fuels (Davies et al. 2010, Diamond et al. 2012, Davies et al. 2015). Methane produce by cattle could be offset by reduced CO_2 and PM2.5 emissions if grazing were to prevent wildfires that would otherwise occur (Ratcliff et al. 2023).

Without knowing how far a permittee would need to drive to private land for grazing, it is unclear how much other carbon emissions would differ. This makes predicting the amount of net carbon emissions for each alternative, and so each alternative's contribution to cumulative effects on climate change, difficult to predict. Net carbon emissions may be unchanged, greater, or lower for any of the alternatives.

Alternative D (No Grazing)

At first, ending grazing on both Allotments would lead to an increase in plant cover and density, this would include an increase in invasive annual species, such as *Schismus* species and *Brassica tournefortii*, and native annuals, particularly *Plantago ovata*. This would result in greater CO_2 absorption from the air but would also increase the risk of wildfire as fine fuels would not be reduced sufficiently by wildlife alone. Fine fuels from *Schismus* and other annual species would accumulate, increasing the risk of wildfire ignitions (Fusco et al. 2019). CO_2 and PM2.5 emissions would increase during wildfires and there would be an increase in fugitive dust for at least 2 years (Morra et al. 2024, Hahnenberger and Nicoll 2012). Four fires occurred on BLM-managed lands between May and July 2024, two of which were less than 0.5 miles from the Sonoran Desert National Monument boundary.

Without knowing how far a permittee would need to drive to private land for grazing, it is unclear how much other carbon emissions would differ. This makes predicting the amount of net carbon emissions for each alternative, and so each alternative's contribution to cumulative effects on climate change, difficult to predict. Net carbon emissions may be unchanged, greater, or lower for any of the alternatives.

5 PERSONS, GROUPS, AND AGENCIES CONSULTED

5.1 LIST OF PREPARERS

The following BLM Staff were involved in the preparation of this RMPA/EA:

Name	Title	Project Expertise
Dale Ohnmeiss	Planning and Environmental Coordinator	NEPA
Amy McGowan	Planning and Environmental Coordinator	NEPA and Editorial
Laura Howland	Wildlife Biologist	Biological Resources, Wildlife, Sensitive Species
Breanna Van Horn	Wildlife Biologist	Maps
Dan Fiorenza	Wildlife Biologist	Wildlife Corridors
Chris Bowman-Prideaux	Rangeland Management Specialist	Land Health, Air, Vegetation, Grazing Resources, Grazing Decision
Doug Whitbeck	State Rangeland Management Lead	Land Health, Grazing Decision
Chris McLaughlin	Archeologist	Cultural and Heritage Resources
Matt Basham	Archeologist	Cultural and Heritage Resources
Mia Somenek	Outdoor Recreation Planner	Wilderness, Visual Resources, Recreation Management
Philip A. Gensler	Paleontologist	Fossils, Affect Resources Table
JoAnn Goodlow	Realty Specialist	Lands and Realty, Affect Resources Table

5.2 TRIBES, INDIVIDUALS, ORGANIZATIONS OR AGENCIES CONSULTED

On April 25, 2025, BLM engaged in Tribal Consultation for the Environmental Assessment and Proposed Decision on the Arnold and Beloat Allotment Grazing Reauthorization. The following tribes were contacted: Ak-Chin, Hopi, Gila River Indian Community, Pascua Yaqui, Salt River Pima-Maricopa Indian Community, Tohono O'odham, Fort McDowell Yavapai Nation, they Yavapai Apache Nation, Fort Mojave Indian Tribe, Pueblo of Zuni, Yavapai Prescot Tribe.

BLM received two responses, both dated May 8, 2025. One from the Tribal Historic Preservation Officer (THPO) of the Gila River Indian Community (GRIC) stating the GRIC-THPO had reviewed these documents, agreed with the Resource Protection Alternative and additional constraints on grazing, and had no further comments on the EA. Further, they commented that the Class I inventory clearly acknowledges O'Odham ancestral and historical ties to this area. The letter further stated that the Gila River Indian Community THPO agreed with all determinations of NRHP eligibility and had no further comments or concerns with the Class I report. The letter continued, saying that the GRIC-THPO will continue to participate in the consultation process for this undertaking. The letter noted that the proposed project area is within the ancestral lands of the Four Southern Tribes (Gila River Indian Community; Salt River Pima-Maricopa Indian Community; Ak-Chin Indian Community and the Tohono O'Odham Nation).

The second response was from the Salt River Pima-Maricopa Indian Community (SRPMIC) THPO stating they had reviewed the draft EA and the Class I inventory, agreed with the Resource Protection Alternative and additional constraints on grazing, and had no further comments on the EA. It continued, stating the Class I inventory is a valuable resource for the study area. The cultural context sections clearly acknowledge O'Odham and Piipaash (Pee Posh) ancestral and historical ties to this area, and the inventory is comprehensive. The tribe had no further comments or concerns with the Class I report. The response ends by stating that the SRPMIC THPO defers to the Gila River Indian Community THPO as lead in the consultation process for the undertaking. The letter noted that the proposed project area is within the ancestral lands of the Four Southern Tribes (Gila River Indian Community; Salt River Pima-Maricopa Indian Community; Ak-Chin Indian Community and the Tohono O'Odham Nation). The SRPMIC THPO will continue to participate in this undertaking.

On May 13, 2025, the BLM received a response from the THPO of the Pascua Yaqui Tribe encouraging the BLM to end grazing or to reduce grazing to a level that supports sustainable plant growth and minimization of effects to heritage resources. Additional information was added to section 3.3.1.3 that describes the analysis conducted following input from public and tribal comments on the productivity of plant communities in the Allotments. Changes were made to Section 3.3.2 that further considers the sustainability of grazing levels of the three grazing alternatives.

The Arizona State Historical Preservation Office (SHPO) was emailed a copy of the Environmental Assessment and Proposed Decisions on April 28, 2025, and asked to review BLM's analysis. On May 12, 2025, the BLM received Arizona SHPO concurrence on the BLM's determination of no adverse effect. Arizona SHPO asked for clarification on the BLM's monitoring procedures. The BLM's works with the Arizona Site Steward Program to monitor cultural sites throughout the Phoenix District.

On December 18 and 19, 2024, the BLM contacted the person with signature authority and the day-to-day operations of Beloat Ranch LLC to discuss two potential alternatives being considered. On December 19, the Ranch Manager was asked to identify an alternative they preferred and contact the BLM by January 6 to incorporate their preferences. As of January 27, Beloat Ranch LLC did not follow up with a reply. The BLM Interdisciplinary Team selected an alternative and completed the Environmental Assessment.

On March 5, 2025, the BLM called Beloat Ranch LLC to notify them of the Proposed Decision. The Proposed Decision was post-marked March 6, 2025.

The BLM received two public comment submissions on the EA. The BLM Response to Public Comment is included as Appendix 8.

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