Appendix B – Standards Determination Document (SDD)

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

STANDARDS DETERMINATION DOCUMENT

September 28, 2021

Need More Sheep Company Operator #270027
Term Grazing Permit Renewal
Indian George Allotment (#10112)

U.S. Department of the Interior
Bureau of Land Management
Ely District Office
Bristlecone Field Office
Phone: (775) 289-1900
Fax: (775) 289-1910

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Introduction

Land Health Assessments are measurable and attainable goals for the desired condition of the biological resources and physical components/characteristics of the ecosystems found within the boundaries of specific grazing allotments. This evaluation seeks to determine: 1) if standards are being achieved or not achieved, and, in cases where standards are not achieved, that significant progress is being made towards achievement of land health. 2) Where it is determined that land health standards are not being achieved, identify whether livestock grazing is a significant factor causing that non-achievement.

This Standards Determination Document (SDD) is for the grazing permit renewal for the Need More Sheep Company (2700027) on the Indian George (10102) grazing allotment. This SDD includes an evaluation of rangeland health of the allotment, as well as evaluation of livestock grazing practices using the BLM Northeastern Great Basin Area Standards and Guidelines for Grazing and Wild Horses and Burros. The Northeastern Great Basin Area Standards and Guidelines provide the direction and the implementation process for completing this rangeland health evaluation. Refer to the Northeastern Great Basin Area Standards and Guidelines for further information regarding the standards and guidelines and the implementation process.

Grazing Allotment Description

The Indian George grazing allotment is located within the Great Basin portion of the Basin and Range physiographic region and lies within both Nevada and Utah. The allotment is located approximately forty-five miles northeast of Ely, Nevada and 140 miles southwest of Salt Lake City, Utah (Figure 1). Indian George is approximately 52,572 acres, the largest portion of which is in White Pine County, Nevada (41,560 acres). The remainder is in Millard County, Utah (11,012 acres). The majority of the Indian George allotment is located within the Snake Valley North (#125) watershed (34,272 acres) and the remaining portion is located in the Deep Creek (#118) watershed (1,324 acres). The Indian George allotment elevation ranges from 5768 feet on the east border to 7878 feet at Government Peak. Approximately 1,516 acres of the Government Peak wilderness area is within the allotment.

The Nevada portion of the allotment lies within the BLM Ely District, Bristlecone Field Office, and the Utah portion lies within the BLM West Desert District, Fillmore Field Office. Livestock grazing is administered for the entire allotment by the Ely District, Bristlecone Field Office.

Livestock Grazing Operation and Administration

The Need More Sheep Company, Ely, Nevada holds the current permit authorizing grazing use on public lands within the Indian George allotment. The current permit authorizes 2,390 sheep for the fall and winter – 10/16 to 4/15. The term of the grazing permit is from 10/1/2017 to 5/15/2023. The permit is attached to based property which is leased for the same ten-year period.

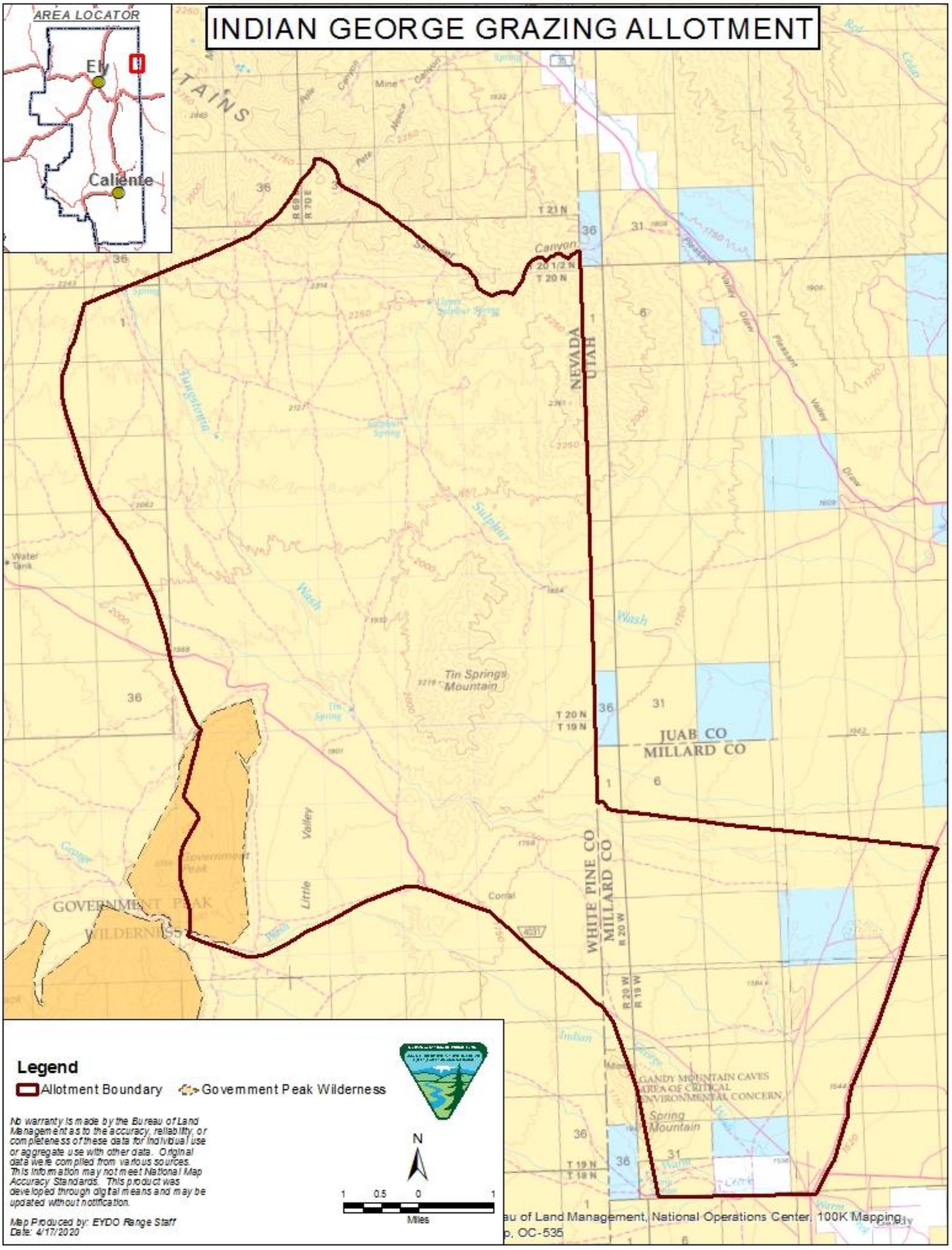

Figure 1. Indian George Grazing Allotment.

Table 1. Current Permitted Use on the Indian George Grazing Allotment.

Livestock Number and Kind	Period of Use	% Public Land	Permitted Use (AUMs)
2,390 Sheep	03/01-04/15	100	723
2,390 Sheep	10/16-2/28	100	2,137

The Need More Sheep Company holds eight BLM grazing permits that support both sheep and cattle operations. In addition, the company hold several U.S. Forest Service grazing permits in northeastern Nevada. Grazing on the Indian George allotment is an integral part of the overall sheep operation as one band of yearling sheep generally spend portions of October through April on the allotment before moving to other BLM or Forest Service allotments.

Water sources for sheep within the allotment are reservoirs located at Tin Springs, Lower Sulphur, and Upper Sulphur Spring. All have been developed. Lower and Upper Sulphur Springs are located in the northern portion of the allotment in the upper elevation. The Tin Springs development is located east of the Tungstonia Wash and west of the Tin Springs Mountains. There is another unnamed spring in the northwest portion of the allotment. Water here is only available in high precipitation years. Sheep use these springs for water as well as snow during the winter. If snow is not present and the springs have frozen, water is hauled to strategic locations to distribute animals and grazing impacts.

History of Permitted Grazing and Multiple Use Grazing Decisions

The current grazing permit for the Need More Sheep Company (10/01/2017 to 5/15/2023) was issued under the authority of Section 416, Public Law 111-88, which authorized the issuance of grazing permits that were not fully processed prior to expiration. The grazing permit issued in 2017 contains the same terms and conditions as the previous grazing permit that expired in 2010.

An Environmental Assessment (EA) (NV-040-99-023) and Grazing Decision was completed for the Indian George allotment in September 1999. That permit was issued for a 10-year period from 2000 to 2010. This permit was issued under the authority of Section 124 of Public Law Number 105-277 (Interior Appropriation for FY1999 in the Omnibus Consolidated and Emergency Supplemental Appropriations Action). Public Law 105-277 authorized grazing from the beginning of the 1999 grazing season until September 30, 1999, or until completion of the processing of the permit in compliance with applicable laws.

Wild Horses

Wild horses occur within the Indian George allotment as part of the Moriah Herd Area (HA). The Moriah HA is 53,312 acres which includes Indian George in Nevada. The majority of the wild horse population in the area resides outside the Moriah HA boundary; but horses occur in the Indian George assessment area. A wild horse census flight was conducted in March 2021 that recorded a direct count of 459 wild horses in and outside of the Moriah Herd Area (HA). The appropriate management level (AML) for the Moriah Herd Area is zero or no wild horses, as

established by the Ely District ROD/RMP (August 2008). Many, if not most, of the severely degraded native rangelands on the Indian George allotment are used by wild horses year-long.

Wild horses are also included in the rangeland health evaluation, although it does not evaluate or assess achievement of the Wild Horse and Burro Standards and Guidelines.

Wildlife

The Indian George allotment is within Management Area 11 and overlaps with hunt units 113 and 114. The allotment provides habitat for elk *(Cervus canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana)*. Overall, Management Area 11 elk populations are showing a slight decrease (NDOW 2021). According to NDOW (personal communication, 2021), hunt unit 113 has had a reduction in elk number over the last several years and hunt unit 114 has remained stable. Both hunt units are within population objectives. In 2021, five cows and 3 bulls were radio collared in Unit 113 to better understand elk use and movements among Nevada, Utah, and the Goshute Indian Reservation (NDOW 2021). Elk that use the Goshute Reservation and the Deep Creek Mountains spend time on Indian George, as well.

The Indian George allotment also provides habitat for animals such as coyotes (*Canis latrans*), rabbits (*Lepus* spp. And *Sylvilagus* spp.), badgers (*Taxidea taxus*), bobcats (*Lynx rufus*), grey and red foxes (*Urocyon cinereoargenteus* and *Vulpes vulpes*), sagebrush obligate birds such as sage sparrow (*Amphispiza belli*), and other small mammals, reptiles, and invertebrates. Also, several species of migratory birds are known to have a distribution that overlaps with the allotment.

Special Status Species

There are approximately 401 acres of Greater Sage-grouse (*Centrocercus urophasianus)* General Habitat Management Area (GHMA), and 9,299 acres classified as Other Habitat Management Area (OHMA) within the Nevada portion of the Indian George allotment. The Utah portion does not contain any Greater Sage-grouse Habitat Management Areas (HMA). This constitutes approximately 1.1 percent and 25.2 percent, respectively of the entire allotment area. There are no known active leks within the allotment, but four can be found within three miles of the western border.

No pygmy rabbit (*Brachylagus idahoensis*) habitat has been identified on the Indian George grazing allotment.

Other special status species that may occur on the allotment include, but are not limited to, golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis),* Brewer's sparrow *(Spizella breweri),* and desert horned lizard *(Phyrnosoma platyrhinos)*. There are three historical ferruginous hawk nests on the northwest section of the allotment and two recent golden eagle nests on the southwest side.

Fire History

BLM's records show not wildland fires have occurred on the Indian George allotment since

1992. However, there is an area east of the Government Peak Wilderness that shows signs of having burned sometime before 1984.

Rangeland Monitoring Data

The primary evaluation period for the Need More Sheep Company grazing permit on the Indian George allotment is for the period 2011 through 2017. The allotment evaluation process includes monitoring information and grazing practices for this period.

Rangeland monitoring data is presented in Appendix 4. There are six key area monitoring locations on the Indian George allotment, four of which are located in Nevada with the remaining two in the Utah portion. Vegetation cover data has been collected at the key areas in 2011, 2014 and 2017 using the line-point intercept (LPI) method. Comparisons to reference conditions and conclusions use line intercept data.

Grazing utilization data was also collected using the key forage plant method and use pattern mapping in 2013, 2017, and 2019.

The primary evaluation period for the rangeland health is between 2011 and 2017. The allotment evaluation process includes monitoring information and grazing practices for this period. An interdisciplinary team (ITD) completed an evaluation for this SDD. The IDT consisted of a Rangeland Management Specialist, Wildlife Biologist, Weeds Specialist, Soil/Water/Air Specialist, Wild Horse Specialist, and others. BLM technical manuals and handbooks were used as reference along with other research and other science-based publications. Specifically, Interpreting Indicators of Rangeland Health (2005), Sampling Vegetation Attributes (1996), the Nevada Rangeland Monitoring Handbook Second Edition (2006), Utilization Studies and Residual Measurements (1999) and the National Range and Pasture Handbook (2003). The IDT reviewed and evaluated rangeland monitoring data, electronic and GIS data files, maps, professional observations, and photographs to determine achievement of Standards and conformance with Guidelines. The grazing permittee also provided review and input associated with the completion of this SDD.

Soil Resources

Soil resources are presented in Appendix 3 from the U.S. Department of Agriculture Natural Resources Conservation Service (NRDCS Web Soil Survey, 2020). Two different surveys were used in this analysis, one for Utah published as the West Millard-Juab Area, Part of Millard and Juab Counties (2013), and the Nevada soil survey for White Pine County Nevada, East Part (2014).

Nevada soils were described in an Order 3 survey and Utah soils were described earlier in an Order 4 survey. Since the scale of mapping differs and the Nevada soils survey is more recent and more detailed than Utah's, this document uses the Nevada soil survey to describe the soils and ecological sites used in the analysis at monitoring locations. Soils described comprise 64.1 percent of soils in the allotment.

Rangeland Health Standards

This SDD evaluates current livestock management with regards to achievement of the standards and conformance with the guidelines for livestock grazing management on the Indian George grazing allotment.

PART 1. STANDARDS DETERMINATION DOCUMENT – Indian George (00112) Grazing Allotment

The Standards and Guidelines for BLM Nevada Northeastern Great Basin Area were developed by the Northeastern Great Basin Area Resource Advisory Council (RAC) and approved in 1997. Standards and guidelines are likened to objectives for healthy watersheds, healthy native plant communities, and healthy rangelands. Standards are expressions of physical and biological conditions required for sustaining rangelands for multiple uses. Guidelines point to management actions related to livestock grazing for achieving the standards.

This Standards Determination Document (SDD) evaluates and assesses achievement of livestock grazing management of the Standards and conformance with the Guidelines for the Nevada's Northeastern Great Basin Area for the Indian George grazing allotment in the Bristlecone Field Office, Ely District. This document will also consider the adequacy of the current grazing management system in place on the allotment and make allotment management recommendations. This document does not evaluate or assess achievement of the Cultural Resources, Wild Horse and Burro Populations, or the Off-highway Vehicle Standards and Guidelines.

PART 2. STANDARD ACHIEVEMENT REVIEW

Standard 1. Upland Sites

Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform.

Indicators:

- ❖ Canopy and ground cover, including litter, live vegetation and rock, appropriate to the potential of the site.

Determination:

□ Achieving the Standard
□ Not achieving the Standard, but making significant progress towards
X Not achieving the Standard, not making significant progress towards

Guidelines Conformance:

□ In conformance with the Guidelines (See Part 3. Guideline Conformance Review)
X Not in conformance with the Guidelines

Livestock as A Causal Factor:

□ Livestock are a contributing factor to not achieving the Standard
X Livestock are not a contributing factor to not achieving the Standard
X Failure to achieve the Standard is also related to other issues or conditions

Summary

The condition or degree of function for this standard has been evaluated based on soil cover and hydrologic function assessments on six monitoring sites and analysis using the on-line tool Rangeland Analysis Platform (RAP). The standards achievement determination includes an analysis of the canopy and ground cover component of the soil indicators. The condition or degree of function for this standard also includes a review and analysis of soils features and characteristics. An evaluation of line-point intercept cover data was completed for the ground and canopy cover analysis. The RAP was also used to determine overall trend of key canopy cover indicators (life forms) for soils. This determination includes an analysis of both the unburned and burned portions of the Indian George allotment.

There are six major soil associations within the Indian George allotment, and minor soils make up the rest (Appendix 2). The soils associations used in this analysis for the allotment include: 1351 Armespan-Gremmers association, 4022 Tarnach association, and 1321 Summermute association.

The standard achievement determination includes reference to the major and dominant ecological site occurring within the Indian George allotment in Nevada. Shallow Calcareous Loam 8-10” P.Z. (R028AY013NV) is the dominant ecological site within the Indian George allotment and represents and includes the primary soil series occurring over the allotment in addition to the primary shrub and grass components common across the majority of the allotment. The analysis of soils and ground cover information for the allotment is based on comparison of the soil features and current ground cover compared to potential ground cover as presented ecological site description.

The expected cover range for the Shallow Calcareous Loam 8-10” P.Z. ecological site is from 15 to 25 percent based on line intercept data. This includes an approximate vegetation cover (basal and crown) soils indicator component. The approximate vegetation cover is representative of the reference state for this ecological site. Total vegetation cover for the three sites in this ESD exceeded the expected range of values. Two of the three monitoring sites are located within an old burn. Shifts from expected life forms and values may be due to a fire in the area that occurred prior to 1984.

The expected cover range for the Shallow Calcareous Slope 8-10” P.Z. (R028AY004NV) ecological site is from 5 to 15 percent based on line intercept data. The soil for this site is the same as the above ESD. There is one monitoring site located in this ESD. Total vegetation cover in the site exceeded the expected range of values.

The standard achievement determination also includes reference to the major and dominant Soil Map Unit (SMU) occurring within the Indian George allotment in Utah. The associated ESD for the monitoring sites in Utah is Coarse Gravelly Loam 5-8” P.Z. (R028AY018NV). This ecological site is the dominant ecological site for the major soil association within the Utah portion of the allotment and represents the primary shrub and grass components common across the majority of the Utah (and portions of Nevada) allotment. The analysis of soils and ground cover information for the allotment is based on comparison of the soil features and current ground cover compared to potential ground cover as presented ecological site description.

The expected cover range for the Course Gravelly Loam 5-8” P.Z. ecological site is from 15 to 25 percent based on line intercept data. The soil for this site is the dominant soil in the allotment and occurs mostly in the Utah portion of the allotment. There are two monitoring sites located in this ESD. Total vegetation cover for the sites exceeded the expected range of values in recent years.

Overall, data showed an increase in total vegetation cover in all sites but one and was within or exceeded the range of expected values for each ESD in 11 of the 13 sampling dates.

The Rangeland Analysis Platform (RAP) was also used to analyze vegetation cover using remote sensing and mathematical modelling. Analyses using the RAP were performed separately in Utah and Nevada because the available soils and ESD spatial data for each state differ in spatial scale. Analysis included data available from 1984 to 2020.

Because soil and vegetation heterogeneity is high in Indian George, two major ESDs within the Nevada portion of the allotment were used in the RAP analysis, representing 50 percent of the

allotment. One major Soil Map Unit (SMU) in Utah was used in the analysis representing 31 percent of the allotment. Results presented in Appendix 4 show overall a decrease in bare ground in the areas analyzed, which indicates increased cover. However, annual invasive forbs and grasses increased in both areas that were analyzed. Perennial grass and forb cover decreased in the Nevada ESDs area but increased in the Utah SMU analyzed. Overall tree cover increased, and shrub cover remained relatively steady in the Nevada ESDs and increased in the Utah SMU.

Conclusion:

Data for analysis to assess Standards determination are presented in Appendix 4.
Adequate cover is protecting soils from erosion. However, shifts in the vegetation communities on Indian George are changing hydrologic function and nutrient cycling in most areas. Tree cover is increasing as is cover of annual non-native invasive plants. Both of these cover changes affect how precipitation impacts soils and soils are at-risk of erosion in many areas. Infiltration of water and permeability through soils are affected with the vegetation changes as less moisture is available to enter deep into the soil profile where desired native shrubs and deep-rooted perennial grasses can use the moisture and hold the soils in place.

Winter livestock grazing is dispersed with only small areas at-risk of compaction where animals gather when water needs to be hauled to them. Most years and in most areas, sheep utilize snow as a water source so compaction in small areas are not an issue on most of the allotment.

Climatological data show a decrease in annual precipitation and increase in annual mean temperature in the area over the past 36 year that data is available. These two factors most likely affect the shift in vegetation and therefore cover types and values in Indian George. Additionally, historic grazing and high wild horse populations in the area are causing severe grazing in some areas of the allotment. These factors which are not related to dormant season (winter) livestock grazing are driving the non-achievement of the Standard.

Evaluation and Determination

Overall, monitoring data showed an increase in total vegetation cover in all sites but one and was within or exceeded the range of expected values for each ESD in 11 of the 13 sampling dates. The Indian George allotment meets or exceed expected cover across the area. However, RAP data shows changes in expected vegetation life form cover that indicates soils are not protected by the appropriate vegetation life form. RAP data show an overall a decrease in bare ground in the areas analyzed, which indicates increased cover. However, vegetation community shifts such as annual forb and grass increases, increased tree cover, and perennial grass and forb cover decreases indicate that soil cover is not meeting the characteristics established for the ecological sites which include conditions required to properly function. Therefore, the Upland Sites Standard is not being met.

Standard #2. Riparian and Wetland Sites

Riparian and wetland areas exhibit a properly functioning condition and achieve State water quality criteria.

Determination

 Achieving the Standard
 Not achieving the Standard, but making significant progress towards
X **Not achieving the Standard, not making significant progress towards**

Guidelines Conformance:
 In conformance with the Guidelines (See Part 3. Guideline Conformance Review)
X **Not in conformance with the Guidelines**

Livestock as A Causal Factor:
 Livestock are a contributing factor to not achieving the Standard
 Livestock are not a contributing factor to not achieving the Standard
X Failure to achieve the Standard is also related to other issues or conditions

Summary

There are six springs on the Indian George allotment (Figure 1.3). Three of these springs have protective fences, although one periodically is torn down by wild horses. Assessments from 2009, 2011 and 2020 show that the springs within intact fenced areas have continued to be functioning properly (at Proper Functioning Condition PFC). The spring that has issues with being functional is a developed spring. Two of these springs flow into small meadows (<1 acre) and reservoirs which are all used by wild horses, livestock, and elk. Three of the springs have no water present, even though two of them were rated as PFC in 2009. The two others have deteriorated due to the presence of wild horses and elk. Livestock were also included in the assessment of the broken fenced area in 2011.

Conclusion

Riparian proper functioning condition assessments for the six springs on the allotment show consistent rating of PFC for the springs that are fenced through the analysis period. The most recent assessments for three springs show no water present, most likely due to drought, changes in localized vegetation (trees) increase, use by wild horses and elk, and climate change. One spring has deteriorated due to fencing issues and heavy use by horses and elk. Given that two springs out of six are currently rated as PFC, the Standard is not achieved for riparian and wetland sites on this allotment.

Evaluation and Determination

Two of the six springs on the Indian George allotment have consistently rated as PFC. Results are presented in Appendix 5. Climate data from the Resource Analysis Platform for the allotment shows an overall decrease in annual precipitation since 1984. Additionally, National Drought Monitor for 2020 indicated the area was in Exceptional Drought. Vegetation data also shows increases in tree cover that could account for the reduced water presence.

Standard #3. Habitat

Habitats exhibit a healthy, productive and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet the life cycle requirements of threatened and endangered species.

Habitat indicators:

- Vegetation composition (relative abundance of species); vegetation structure (life forms, cover, height, or age classes); vegetation distribution (patchiness, corridors); vegetation productivity; and vegetation nutritional value.

Determination:

☐ Achieving the Standard
☐ Not achieving the Standard, but making significant progress towards
X Not achieving the Standard, not making significant progress towards

Guidelines Conformance:

☐ In conformance with the Guidelines (See Part 3. Guideline Conformance Review)
X Not in conformance with the Guidelines

Livestock as A Causal Factor:

☐ Livestock are a contributing factor to not achieving the Standard
X Livestock are not a contributing factor to not achieving the Standard
X Failure to achieve the Standard is also related to other issues or conditions

Summary:

The objective for ecological sites within Indian George is that monitoring sites representing ESDs are within Reference State 1.0 or Current Potential State 2. Current monitoring data cover and composition (5 of 6 monitoring sites) are within either Reference State 1.0 or Current Potential State 2.0, therefore, the objective is met for all sites. Two sites are at-risk of crossing an

ecological threshold, given high shrub cover and decreasing perennial grasses, as well as high composition of non-native invasive annual plants.

RAP data show shifts in vegetation composition such as increases in non-native invasive forbs and grasses and native trees that are changing ecological processes such as changes in structure and function of some major portions of the allotment. These changes affect wildlife habitat negatively.

Climatological data show a decrease in annual precipitation and increase in annual mean temperature in the area over the past 36 year that data is available. These two factors, among others, most likely affect the shift in vegetation and therefore cover types and values in Indian George. These drivers of the ecological systems on Indian George are affecting wildlife habitat. These factors which are not related to dormant season (winter) livestock grazing are driving the non-achievement of the Standard.

Conclusion:

The condition or degree of function for this standard has been evaluated based on cover and composition assessments on six monitoring sites and analysis using the RAP. The standards achievement determination includes an analysis of the composition of the vegetation life forms as indicators. An evaluation of line intercept cover data was completed for the canopy cover, and composition was calculated based on these values for the analysis. The RAP was also used to determine overall trend of key canopy cover indicators (life forms) for wildlife habitat. The condition or degree of function for this standard also includes a review and analysis of expected and actual vegetation features and characteristics in relation to the State and Transition models for the respective ESDs. This determination includes an analysis of both the unburned and burned portions of the Indian George allotment. Results are presented in Appendix 4.

This SDD includes a review and analysis of monitoring information for reference to the state and transition model for the selected ecological sites that are located only within Greater Sage grouse habitat. The current state of the selected ecological site is determined based on the application of the ecological site characteristics identified in the state and transition model for each of the selected ecological sites. Current monitoring information is applied to evaluate ecological site characteristics. The current state is also based on interpretation and evaluation of quantitative and qualitative monitoring information. Major ecological sites have been selected based on key area location and dominance of the ecological site within the Indian George allotment.

In addition to identifying the current state for the selected ecological site, the State and Transition models are the basis for determining progress toward achievement of the standards for rangeland health. The evaluation and interpretation of all available monitoring data is also applied to determine if the standards are being met or if significant progress is being made toward meeting the standards. If the current state or community phase includes the desired plant community or is at the current potential state and community phase or the reference state and community phase the standard is considered met.

A review and analysis of the ESDs and current vegetation was conducted to determine the current state and plant community phase for three ecological sites using the respective state and transition diagrams as presented in the ESDs. This analysis includes a description of the current condition in relation to the state and plant community phase described in each state and transition diagram. Reviews and interpretation of the state and plant community phases include the presence of grass and shrub component, the plant species of the shrub and grass component, the composition of the grass, shrubs, non-native invasive annuals. The plant community vegetation composition and basal and crown cover information collected using the line intercept cover method conducted at the key areas was evaluated for this determination. For example, the Reference State community phases were evaluated against the Potential state community phases. The Shallow Calcareous Loam 8-10 (R028AY013NV) Reference State community is dominated by black sagebrush in the overstory with Indian ricegrass and needleandthread grass dominate in the understory. The reference State represents the natural range of variability under pristine conditions.

Black sagebrush is expected to co-dominate with Indian ricegrass and needleandthread grass on the ecological site Shallow Calcareous Loam 8-10" P.Z. that is represented by three of six monitoring locations on Indian George. Two sites (IG-NV-01 and IG-NV-03) were evaluated with current data for this ESD. Both sites were determined to be in Current Potential State 2.3 at-risk. Black sagebrush and Indian ricegrass were present at each site, however, needleandthread grass were not detected at either site. Rabbitbrush dominated both sites. Additionally, non-native invasive annual species had high composition values (37 and 63 percent, respectively). Although these two sites are in the Current Potential State and are meeting the objective, the plant communities for each site have shifted to an at-risk state meaning they are at-risk of crossing an ecological threshold. IG-NV-04 is also a Shallow Calcareous Loam 8-10" P.Z. ecological site and its composition of expected black sagebrush and Indian ricegrass dominats the site. This site also has lost needleandthread grass. Rabbitbrush is increasing and non-native invasive annuals are a small component of the community. This site is in Current Potential 2.2.

Shadscale saltbush and Indian ricegrass are the expected dominant species for the Coarse Gravelly Loam 5-8" P.Z. ecological site that is represented by two monitoring locations. Indian ricegrass was not detected at IG-UT-01, and galleta grass, a shallow-rooted species, composed 20 percent of total composition. Shrubs dominated the site, with no rabbitbrush present. No non-native invasive annual forbs or grasses were present at this site. This site is in Reference State 1.3.

Shadscale dominates IG-UT-02 with 70 percent composition, and Indian ricegrass represented 20 percent of the composition. Fluff grass was the other perennial grass species present (1 percent cover, 10 percent composition). Rabbitbrush was also not present at this site. No non-native invasive annual forbs or grasses were present at the site. Since non-sprouting shrubs are becoming dominant and grasses are still represented with no non-native invasive annuals, this site is in Reference State 1.3.

Overall, data showed vegetation composition as expected. Three of the five sites (60 percent) in which recent monitoring data was available were in in the Current Potential or Reference States.

Two sites were in the at-risk phase of Current Potential signaling shifts in community composition structure and function in which a threshold could be crossed.

The RAP was also used to analyze vegetation cover using remote sensing and mathematical modelling. Analyses using the RAP were performed separately in Utah and Nevada because the available soils and ESD spatial data for each state differ in spatial scale. Analysis included data available from 1984 to 2020.

Because soil and vegetation heterogeneity are high in Indian George, two major ESDs within the Nevada portion of the allotment were used in the RAP analysis, representing 52 percent of the allotment. One major Soil Map Unit (SMU) in Utah was used in the analysis representing 31 percent of the allotment. Results show overall a decrease in bare ground in the areas analyzed, which indicates increased cover. However, annual invasive forbs and grasses increased in both areas that were analyzed. Perennial grass and forb cover decreased in the Nevada ESDs area but increased in the Utah SMU analyzed. Overall tree cover increased, and shrub cover remained relatively steady in the Nevada ESDs and increased in the Utah SMU.

Fish and Wildlife Habitat Overview

Threatened and Endangered Species:

There were no threatened or endangered species identified within the Indian George Allotment.

Migratory Birds:

The allotment provides a wide range of habitats for migratory birds such as breeding, nesting, and foraging. The Great Basin Bird observatory did not conduct any surveys within the allotment boundary. A survey conducted 3 miles outside the boundary of similar elevation in 1999 documented species such as Berwick's wren, broad-tailed hummingbird, chipping sparrow, gray flycatcher, spotted towhee, western scrub jay and many others.

Big Game:

The allotment provides habitat for several big game species. According to the Ely District 2008 Resource Management Plan (RMP), there are 20,690 acres of year-round elk habitat throughout the allotment. The Indian George allotment contains 10,406 acres of mule deer winter range habitat, 1,118 acres of which are in the southwest corner and the remaining 9,288 acres along the north border. Pronghorn antelope, specifically the Eastern White Pine herd, use all except 5,600 acres of the allotment as their home range movement corridor. (Figure 1.7)

The Indian George allotment is within Management Area 11 and overlaps with hunt units 113 and 114. The allotment provides habitat for elk *(Cervus canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn (*Antilocapra americana)*. Overall, Management Area 11 elk populations are showing a slight decrease (NDOW 2021). According to NDOW (personal communication, 2021), hunt unit 113 has had a reduction in elk number over the last several years and hunt unit 114 has remained stable. Both hunt units are within population objectives.

In 2021, five cows and 3 bulls were radio collared in Unit 113 to better understand elk use and movements among Nevada, Utah, and the Goshute Indian Reservation (NDOW 2021). Elk from the Goshute Reservation and the Deep Creek Mountains also use Indian George.

BLM Sensitive Species:

Greater Sage-Grouse – The Indian George allotment, as defined by the Greater Sage-grouse Land Use Plan Amendment (2015), contains 401 acres of General Habitat Management Area (GHMA) and 9,299 acres of Other Habitat Management Area (OHMA) in Nevada. The Utah mapping shows no Habitat Management Areas (HMA) for that portion of the allotment. There are currently no known active leks within the allotment, but four are located within three miles of the allotment's western border. (Figure 1.8).

Greater Sage-grouse are generally traditional in their seasonal movement patterns and select seasonal habitat within their respective home ranges, which include breeding, nesting/early brood-rearing, late brood-rearing, and winter habitat (Figure 1.9). Bureau of Land Management field offices that manage sage grouse habitat are required to incorporate the use of mid-, fine-, and site scale indicators (Table 2-2 of ARMPA) and the habitat suitability rating process provided by the Sage-Grouse Habitat Assessment Framework (HAF; Stiver et al. 2015) when assessing habitat for a population or subpopulation. The Indian George allotment has only one plot (IG-NV-02) that overlaps OHMA and seasonal habitat, however, the most recent data for this area is from 2011 and the HAF suitability ratings will not be incorporated because the data is insufficient to evaluate. Data from three key areas collected in 2017 was evaluated but a HAF suitability rating is not given due to the plots not being within an HMA. This evaluation concentrated on percent sagebrush cover, percent forb cover, and percent grass cover along with preferred forb availability.

Nesting and Early Brood-rearing Habitat

As defined in the ARMPA, the nesting and early brood-rearing season takes place from April 1 to June 30. Nesting and early brood-rearing had only one plot to evaluate habitat condition. Table 2.1 shows the habitat indicators for IG-NV-04. Ideal nesting and early brood-rearing cover should be >20 percent sagebrush cover, >5 percent forb cover, and >7 percent grass cover; however, plot IG-NV-04 only had 7 percent sagebrush cover, 1 percent forb cover, and 4 percent grass cover. Tree encroachment hinders the growth potential of this area. Based on cover data for this plot, the general area is not meeting the habitat objectives for nesting and early brood-rearing.

Late Brood-rearing Habitat

June 15 to September 15 is known as Greater Sage-grouse late brood-rearing period. Table 2.2 shows the habitat indicators of the three plots with 2017 data for condition evaluation. Ideal late brood-rearing cover should be >20 percent sagebrush cover, >19 percent perennial grass and forb cover, with >12 cm mean deep-rooted perennial bunchgrass height. Data from IG-NV-01 shows 0 percent sagebrush cover, 12 percent perennial grass and forb cover, with 22.7 cm average bunchgrass height. IG-NV-03 data shows 0 percent sagebrush cover, 3 percent grass and forb

Table 2.1. Indian George Greater Sage-grouse Nesting & Early Brood-rearing Habitat Indicators (2017).

	Sagebrush		Perennial Grass		Perennial Forb				
Plot	Cover (%)	Height (cm)	Cover (%)	Height (cm)	Cover (%)	Height (cm)	Preferred Forb Availability (species)	Annual Grass Cover (%)	Total Shrub Cover (%)
IG-NV-04	7	29.2	4	19	1	NC*	4	46	19

cover, with 36.6 cm mean bunchgrass height. IG-NV-04 presents 7 percent sagebrush cover, 5 percent perennial grass and forb cover, with 19 cm average deep-rooted perennial bunchgrass height. Standards for sagebrush cover were not achieved by all three key area. The height for deep-rooted perennial bunchgrass standard was achieved by all areas; however, standards for percent cover of grasses and forbs were not met. Based on cover data for these plots, the general area is not meeting the habitat objectives for late brood-rearing.

Table 2.2. Indian George Greater Sage-grouse Late Brood-rearing Habitat Indicators (2017).

Plot	Sagebrush Cover (%)	Sagebrush Height (cm)	Perennial Grass & Forb Cover (%)	Deep-rooted Perennial Bunchgrass Height (cm)	Perennial Forb Cover (%)	Preferred Forb Availability (species)
IG-NV-01	0	NC*	12	22.7	0	2
IG-NV-03	0	NC*	3	36.6	0	2
IG-NV-04	7	29.2	5	19.0	1	4

*Not collected

Winter Habitat

Table 2.3 shows the winter (November 1 to February 28) habitat indicators. IG-NV-01, IG-NV-03, and IG-NV-04 were each evaluated for this seasonal habitat. Ideal conditions include >10 percent sagebrush cover and >25 cm mean sagebrush height. Sagebrush cover for IG-NV-01 and IG-NV-03 is 0 percent, therefore sagebrush height could not be collected. These areas have inadequate sagebrush cover due to high pinyon/juniper encroachment. IG-NV-04 data shows 7 percent sagebrush cover and 29.2 cm sagebrush height; this plot reaches minimal winter seasonal requirements. Based on cover data for these plots, the general area is not meeting the habitat objectives for winter.

Table 2.3. Indian George Greater Sage-grouse Winter Habitat Indicators (2017).

Plot	Date	Sagebrush Cover	Sagebrush Height
IG-NV-01	7/14/2017	0%	NC*
IG-NV-03	7/14/2017	0%	NC*
IG-NV-04	7/14/2017	7%	29.2 cm

*Not collected

Evaluation and Determination

Overall, monitoring data showed that 60 percent of monitoring sites were in either Reference or Current Potential States on the Indian George allotment. However, RAP data shows changes in expected vegetation life form cover that indicates vegetation shifts that may not provide adequate wildlife habitat and will not maintain ecosystem function. Although the RAP showed bare ground is decreasing, vegetation community shifts such as annual forbs and grasses increases, increased tree cover, and perennial grass and forb cover decreases indicate that habitat and ecosystem function condition are not being met. Because available data is limited to analyze Greater Sage-grouse habitat, it is assumed we are not meeting habitat objectives for nesting, early brood-rearing, late brood-rearing, and winter habitats throughout the allotment.

PART 3. ARE LIVESTOCK A CONTRIBUTING FACTOR TO NOT MEETING THE STANDARDS?

This section summarizes the above findings for the Indian George Allotment as to whether or not livestock are a contributing factor to not achieving the Standards for Rangeland Health. This section also identifies the other factors, issues, conditions, or causes for not achieving the Standards.

According to the Standards and Guidelines for Nevada's Northeastern Great Basin Area, it must be determined if livestock grazing is a significant factor in the non-attainment of the Standards and Guidelines (BLM 1997). This section summarizes the above findings for the Indian George Allotment as to whether livestock are a contributing factor to not achieving the Standards for Rangeland Health. This section also identifies the other factors, issues, conditions, or causes for not achieving the Standards.

Grazing related questions as part of the determination process

1. Is it more likely than not that existing grazing management practices or levels of grazing use are significant factors in failing to achieve the Standards or conform to the Guidelines? **No.**

2. Is it more likely than not that existing grazing management needs to be modified to ensure that the Fundamentals of rangeland health are met, or making significant progress toward being met? **No.**

Standard # 1. Upland Sites

Livestock (sheep) are not a contributing factor to the non-achievement of the Upland Sites Standard. Sheep have grazed the area as early as mid- October and as late as the end of March which is the dormant season for vegetation. Sheep use has not been made during the critical spring vegetation growth period, but year-round wild horse use has. **No.**

Wild horses, drought, historic heavy grazing, decreasing annual precipitation and increasing mean annual temperature are considered factors in the non-achievement of the Upland Sites Standard. Wild horses use this area year long. Wild horse census data combined with utilization studies and professional observations indicate that wild horses have contributed to heavy and severe use levels of key forage plants in many places on the allotment. A wild horse census flight was conducted in March 2021 that recorded a direct count of 459 wild horses in and outside of the Moriah Herd Area (HA). The appropriate management level (AML) for the Moriah Herd Area is zero or no wild horses, as established by the Ely District ROD/RMP (August 2008). Many, if not most, of the degraded native rangelands on the Indian George allotment are used by elk and wild horses year-long.

Standard # 2. Riparian and Wetland Sites

Riparian proper functioning condition assessments for the six springs on the allotment show consistent rating of PFC for the springs that are fenced through the analysis period. The most recent assessments for three springs show no water present, most likely due to drought, changes in localized vegetation (trees) increase, use by wild horses and elk, and climate change. One spring has deteriorated due to fencing issues and heavy use by horses and elk. Given that two springs out of six are currently rated as PFC, the Standard is not achieved for riparian and wetland sites on this allotment. **No.**

Standard # 3. Habitat

Livestock (sheep) are not a contributing factor to the non-achievement of the Habitat Standard, largely for the same reasons cited above for the Upland Sites Standard. Livestock use levels on key forage species by sheep have not exceeded those recommended for a healthy plant community and watershed with an appropriate composition of native grasses and forbs. Livestock use levels have not exceeded recommended levels as stated in the Nevada Rangeland Monitoring Handbook, the Ely Record of Decision and Resource Management Plan (August 2008) and the National Range and Pasture Handbook (NRCS). **No.**

Heavy or severe wild horse grazing has occurred during the critical spring growth period and year-long use. Native grasses and forbs in particular have continually been in poor vigor and production in the area due to continual year-long elk and wild horse use.

PART 3. GUIDELINE CONFORMANCE REVIEW

STANDARD 1 GUIDELINES:

Indian George Allotment – Permit #2700027: Current wild horse management practices do not conform to Guidelines 1.1 and 1.3. Land management treatments (1.2) may be appropriate for many portions of this use area, for example, in black sagebrush rangelands in areas where pinyon and juniper trees have increased in sagebrush-dominated rangelands. **Yes.**

STANDARD 2 GUIDELINES:

Indian George Allotment – Permit #2700027: Current wild horse and wildlife management practices do not conform to guidelines. Riparian areas are used heavily year-round by horses and elk. **Yes.**

STANDARD 3 GUIDELINES:

Indian George - Permit #2700027: Current wild horse management practices do not conform to Guidelines 3.1, 3.2, 3.3, and 3.6. Land management treatments (3.4) may be appropriate for many portions of this use area, for example, in black sagebrush rangelands in areas where pinyon and juniper trees have increased in sagebrush-dominated rangelands. **Yes.**

PART 4. MANAGEMENT PRACTICES TO ACHIEVE STANDARDS AND CONFORM WITH GUIDELINES

This SDD indicates that changes are not needed to the current grazing permit. The Environmental Assessment (EA) for the permit renewal will analyze a proposed action and grazing alternatives that address the need to make changes to livestock management practices and that achieve or make progress towards achievement of the Standards for Rangeland Health and that conform to the Guidelines. The EA will be developed based upon the recommended livestock management practices and general grazing options presented below. The new terms and conditions of grazing use resulting from the EA would be included in the term grazing permit for a period not to exceed ten years.

The following livestock management practices are presented as recommendations and general grazing options in order to achieve or make progress towards achieving the Standards for Rangeland Health and conforming to the Guidelines.

Recommended Livestock Management Practices - Permit #2700027 –The Indian George Allotment

1. Do not change the livestock grazing season of use (10/16 to 04/15) or the AUMs associated with the current permit. Winter grazing by sheep outside the growing season is a sustainable use of forage and therefore does not need to change. Past and current utilization by sheep has been below recommended levels on shrubs and grasses. Past use has been below permitted AUMs.

2. Gather wild horse herd numbers to AML which is zero for the Moriah HA.

3. Any water hauling done by the grazing permittee associated with this grazing permit must be in accordance with Nevada State Water Law regarding the use or location of water outside the place of use as indicated on a water right permit.

4. Locate water haul sites at least 0.5 miles away from winterfat-dominated sites. Base placement on site specific assessment and characteristics such as riparian, topography, cultural, special status species, etc. (from the Resource Program Best Management Practices (Ely District BLM ROD/RMP – August 2008) Livestock Grazing Page A. 1-9.

5. Water hauling is required for sheep grazing in the absence of snow availability. Water hauling for sheep is to occur primarily along the main roads.

6. Sheep will not be trailed or bedded in winterfat-dominated areas. Sheep camps will be a minimum of ½ mile from winterfat areas. Sheep camps will be moved at least every 7 days. No two sheep camps will locate in the same area in a grazing season. Sheep camps and bedding grounds will be located a minimum of ½ mile from springs. If sheep must water at springs, they must move to and from the area in a timely manner.

7. A herder will accompany the sheep band at all times. Sick or diseased domestic sheep will be promptly removed from public lands. Any stray domestic sheep will be promptly removed or returned to the herd by the permittee upon detection. Any direct association observed between domestic sheep and wild sheep by the permittee or any representative (i.e., herder, other ranch employee) will be promptly reported to the NDOW or BLM.

8. From the Resource Program Best Management Practices (Ely District BLM ROD/RMP August 2008) Livestock Grazing Section A. 1-8. Develop grazing systems to control or rest grazing use on the proposed pastures sites after March 1 or when the critical growing season begins. Allow spring grazing use during the critical growing period if a grazing rotation system that provides rest from grazing during the critical growing period at least every other year for all areas is in place. Utilization during the critical growth period should not exceed 35% under any circumstances.

9. Sheep grazing practices should be in accordance with the recommendations of the State and Transition Model for sagebrush dominant ecological sites that are in a shrub dominant state. Recommendations are that grazing should occur primarily during the winter, dormant season.

10. Grazing applications and annual grazing use plans will be submitted to the BLM and approved by the authorized officer prior to grazing within the allotment.

Allowable Use Levels – Proposed Pastures One, Two and Three- Indian George Allotment – all herbivores (Sheep, wild horses, and wildlife)

1. An allowable use level will be established as 35% of the current year's growth by weight for any critical growing season use (generally 3/1to 3/30) of the key shrub winterfat. An allowable use level will be established as 50% of the current year's growth by weight for any total season spring use (3/1 to 3/30) of the key shrubs winterfat, shadscale, (or other shrub determined to be a key species for livestock, wild horses, or wildlife)

2. An allowable use level for the Indian George Allotment will be established as 50% growth by weight of the current year's growth by weight for the key native species for fall/winter grazing. These species are black sagebrush, shadscale, winterfat, Indian ricegrass, needle and thread, and bluebunch wheatgrass. Utilization will be measured at established key areas or other sites representative of the dominant vegetation in the use area. When an average of 50% use is reached in non-sage grouse habitat and 35% use in designated sage grouse habitat at these sites, livestock would be removed from the pasture and moved to another location, within 3 days.

3. An allowable use level for the Indian George Allotment will be established as 40% of the current year's growth by weight for the key native species within priority wildlife habitat. These species are black sagebrush and shadscale. Utilization will be measured at established key grazing areas or other sites representative of the dominant vegetation in the use area. When an average of 40% use is reached at these sites, livestock would be removed from the pasture and moved to another location within 3 days.

4. Allowable use levels for the undeveloped riparian area within the Indian George Allotment will be 35% of current year's growth.

5. Livestock will be moved to another authorized pasture or removed from the allotment before utilization objectives are met or no later than 3 days after meeting the utilization objectives. Any deviation in livestock movement will require authorization from the authorized officer.

ADDITIONAL STIPULATIONS COMMON TO ALL GRAZING ALLOTMENTS:

1. Livestock numbers identified in the Term Grazing Permit are a function of seasons of use and permitted use. Deviations from those livestock numbers and seasons of use may be authorized on an annual basis where such deviations are consistent with multiple-use objectives. Such deviations will require an application and written authorization from the authorized officer prior to grazing use.

2. The authorized officer is requiring that an actual use report (Form 4130-5) be submitted within 15 days after completing your annual grazing use.

3. Grazing use will be in accordance with the Standards and Guidelines for Grazing Administration. The Standards and Guidelines have been developed by the respective Resource Advisory Council and approved by the Secretary of the Interior on February 12, 1997. Grazing use will also be in accordance with 43 CFR Subpart 4180 - Fundamentals of Rangeland Health and Standards and Guidelines for Grazing Administration.

4. If future monitoring data indicates that Standards and Guidelines for Grazing Administration are not being met, the permit will be reissued subject to revised terms and conditions.

5. The permittee must notify the authorized officer by telephone, with written confirmation, immediately upon discovery of any hazardous or solid wastes as defined in 40 CFR Part 261.

6. Reconfigure riparian exclosure fence at the unnamed spring aka: Tin Spring. Repair and expand fences on Upper and Lower Sulphur Springs to protect larger area around spring source, channels and meadows.

7. The permittee is responsible for all maintenance of assigned range improvements including wildlife escape ramps for both permanent and temporary water troughs.

8. When necessary, control or restrict the timing of livestock movement to minimize the transport of livestock-borne noxious weed seeds, roots, or rhizomes between weed-infested and weed-free areas.

9. The placement of mineral or salt supplements will be a minimum distance of ½ mile from known water sources, riparian areas, winterfat dominated sites, sensitive sites, populations of special status plant species, and cultural resource sites. Mineral and salt supplements will also be one mile from active sage-grouse leks. Placing supplemental feed (i.e., hay, grain, pellets, etc.) on public lands without authorization is prohibited.

PART 5. MANAGEMENT RECOMMENDATIONS TO ACHIEVE STANDARDS

1. Continue rangeland monitoring of the Indian George allotment for livestock in compliance with proper allowable use levels and vegetative conditions.

2. Carry forward current livestock grazing management practices into an updated Livestock Grazing Use Agreement with a ten-year term to coincide with the term of the grazing permit.

3. Grazing Use Agreement with a ten-year term to coincide with the term of the grazing permit. Livestock grazing management practices to be carried forward include:

a. Permit 2309 active AUMs of sheep grazing

b. Season of use will remain 10/1 to 4/15

4. Maximum allowable use levels will be as follows:

a. Utilization of current year's growth by weight for any critical growing season use (generally 3/1to 3/30) of the key shrub winterfat. Utilization of 50% of the current year's growth by weight for any total season spring use (3/1 to 3/30) of the key shrubs winterfat, shadscale, (or other shrub determined to be a key species for livestock, wild horses, or wildlife).

b. Utilization of 50% growth by weight of the current year's growth by weight for the key native species for fall/winter grazing. These species are black sagebrush, shadscale, winterfat, Indian ricegrass, needle and thread, and bluebunch wheatgrass. Utilization will be measured at established key areas or other sites representative of the dominant vegetation in the use area. When an average of 50% use is reached in non-sage grouse habitat and 35% use in designated sage grouse habitat at these sites, livestock would be removed from the pasture and moved to another location, within 3 days.

c. Utilization of 40% of the current year's growth by weight for the key native species within priority wildlife habitat. These species are black sagebrush and shadscale. Utilization will be measured at established key grazing areas or other sites representative of the dominant vegetation in the use area. When an average of 40% use is reached at these sites, livestock would be removed from the pasture and moved to another location within 3 days.

d. Allowable use levels for the undeveloped riparian area within the Indian George Allotment will be 35% of current year's growth.

e. Livestock will be moved to another authorized pasture or removed from the allotment before utilization objectives are met or no later than 3 days after meeting the utilization objectives. Any deviation in livestock movement will require authorization from the authorized officer.

f. Flexibility in grazing seasons will be allowed if it is consistent with meeting the Multiple Use Objectives for the allotment and agreed upon by the BLM authorized officer and he permittee.

g. Annual grazing use billings will be based on advanced billing cycles for the periods beginning October 1 ending February 28 and March 1 ending April 15. Actual Use Reports will be due by April 30 each year.

h. Annual grazing will be completed with consultation, coordination, and cooperation between the BLM and the grazing permittee.

i. Monitoring will be conducted by the BLM in coordination with the permittee. Specific monitoring studies to be collected may include proper functioning condition (PFC) on

riparian areas, cover studies, ecological condition studies, drought, key species utilization studies, and Interpreting Indicators of Rangeland Health. Additional studies may be collected if the need arises.

j. Continue to implement current wild horse management plans and appropriate management.

k. Restore sagebrush-bunchgrass communities in areas where shrubs dominate and grasses and forbs have decreased in composition, especially in Greater Sage-grouse habitats. This can be accomplished by reducing sagebrush cover and seeding with desirable species by mechanical or grazing methods.

l. Restore sagebrush-bunchgrass communities in areas where trees are increasing. This can be accomplished by mechanical methods.

m. Consider re-establishing winterfat-bunchgrass communities in areas where they have been degraded.

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Prepared by:

Maria Ryan Date
Rangeland Management Specialist

Reviewed by:

Andy Gault Date
Soil/Water/Air/Floodplains/Riparian/Wetlands

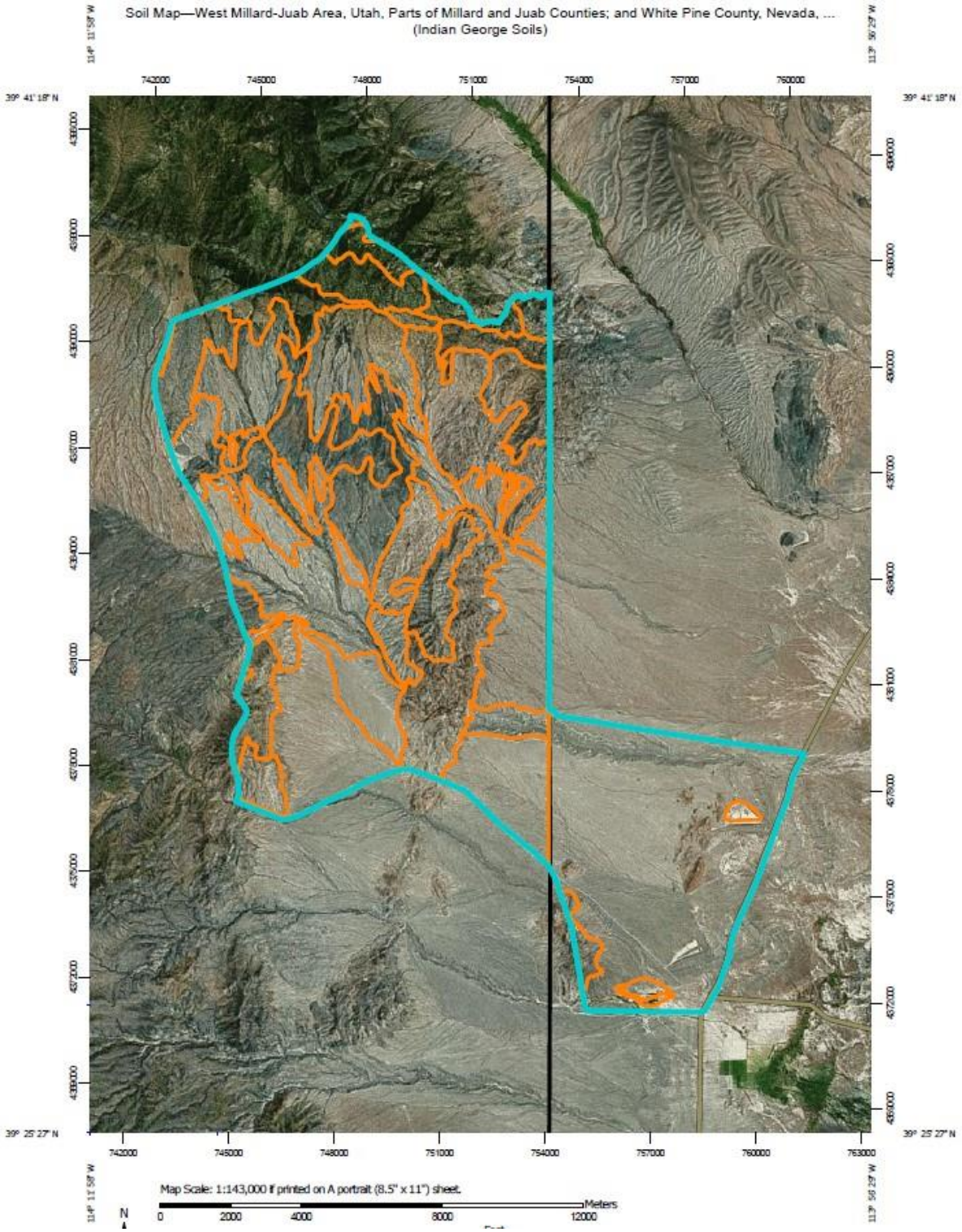
Ben Noyes Date
Wild horses and burros

Elizabeth Donaldson Date
Wildlife/Migratory Birds/Special Status Animals and Plants

I concur:

Jared Bybee Date
Field Manager
Bristlecone Field Office

APPENDIX 1. MAPS



Map 1.1. Soils on the Indian George Grazing Allotment.

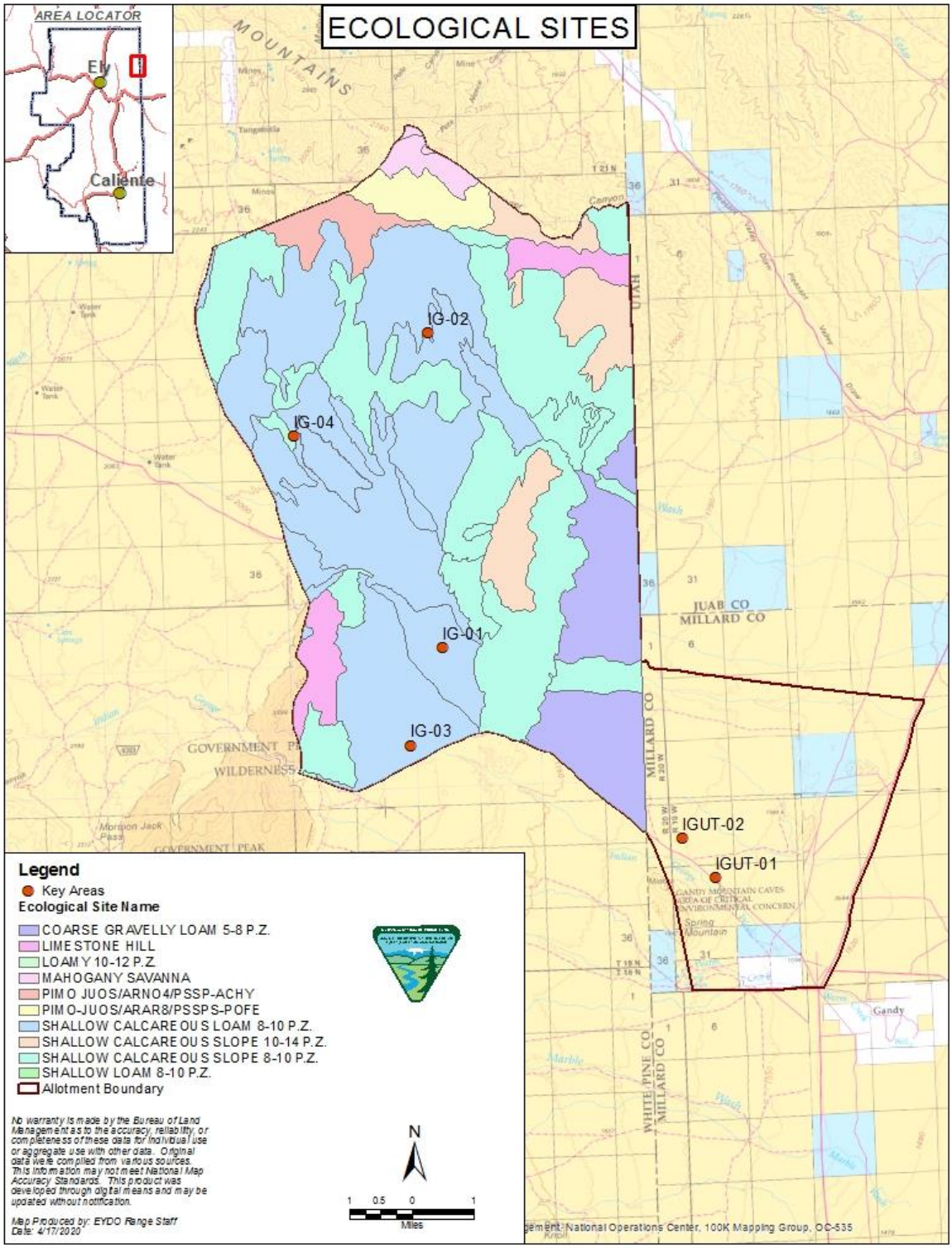


Figure 1.2. Ecological Sites and Key Areas for the Indian George Grazing Allotment.

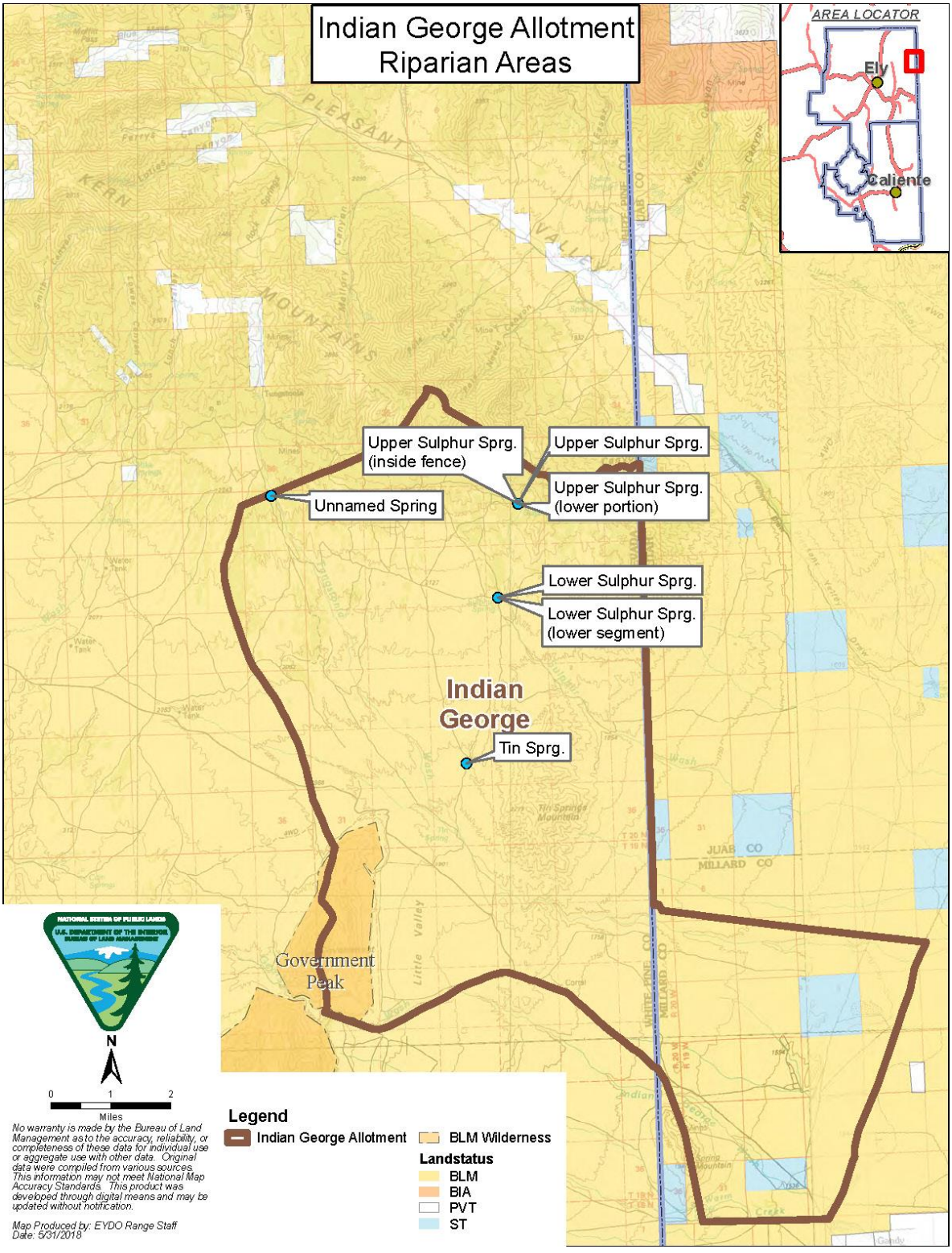


Figure 1.3. Riparian Areas on the Indian George Grazing Allotment.

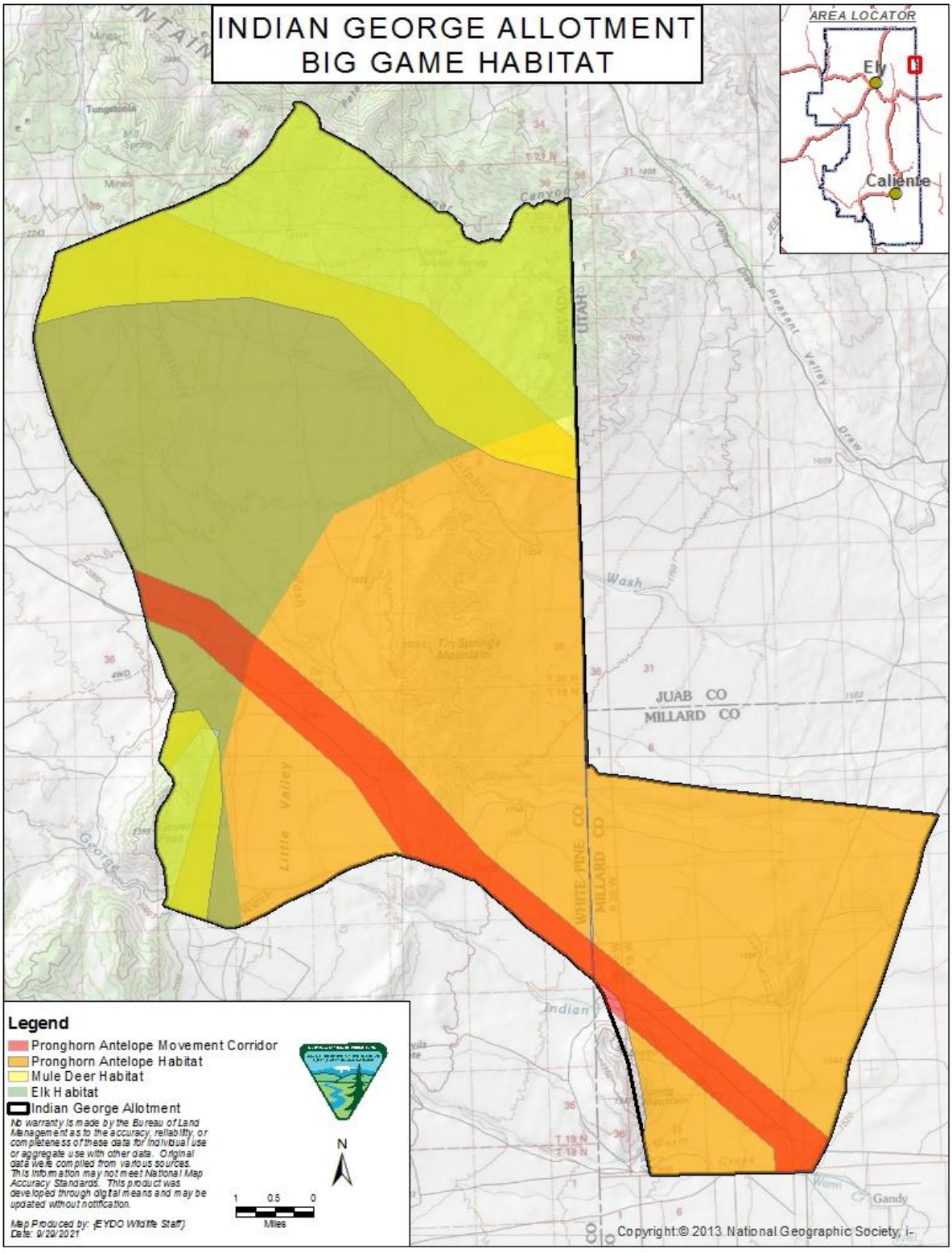


Figure 1.4. Wildlife Big Game Habitat.

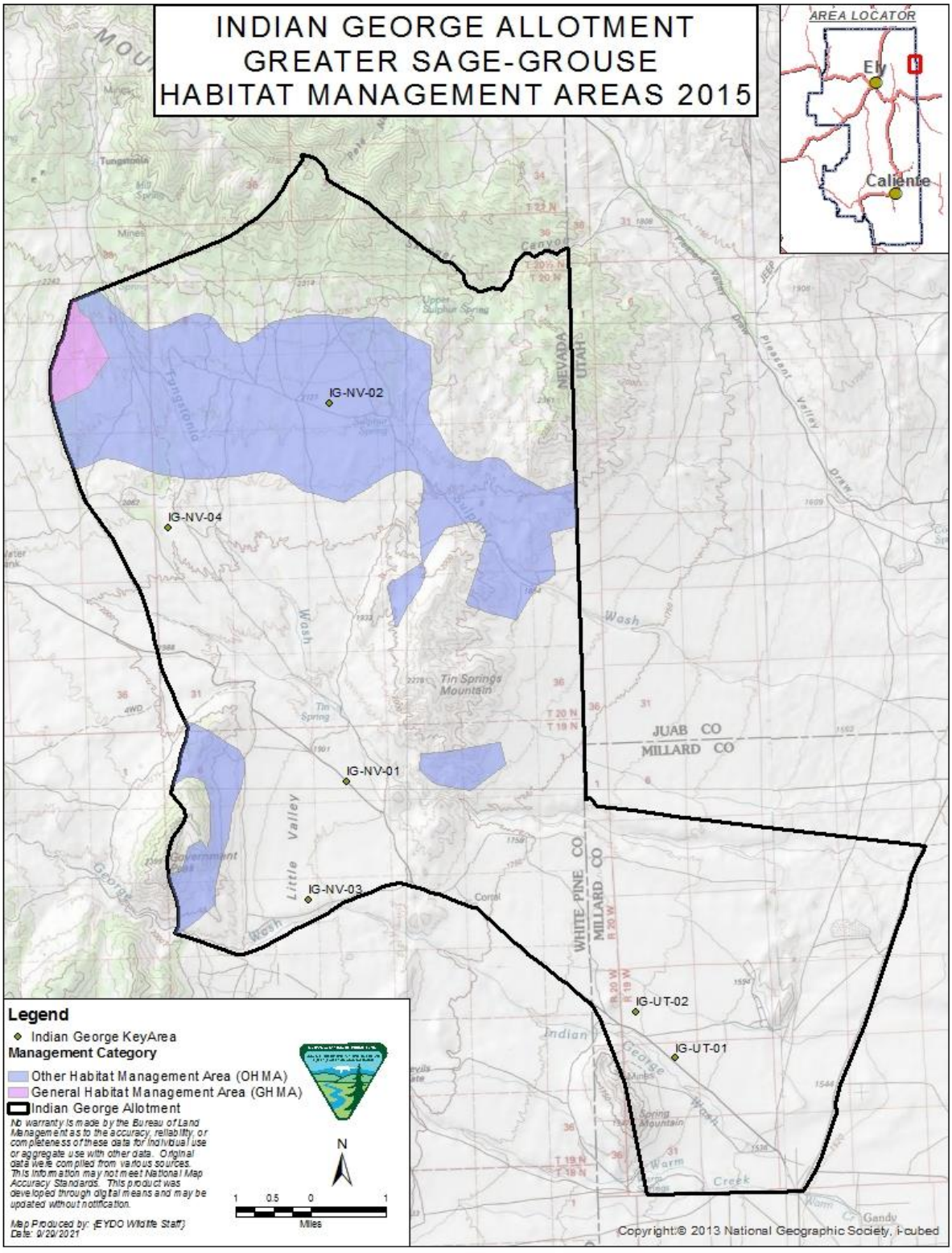


Figure 1.5. Great Sage-grouse Habitat Management Areas (2015).

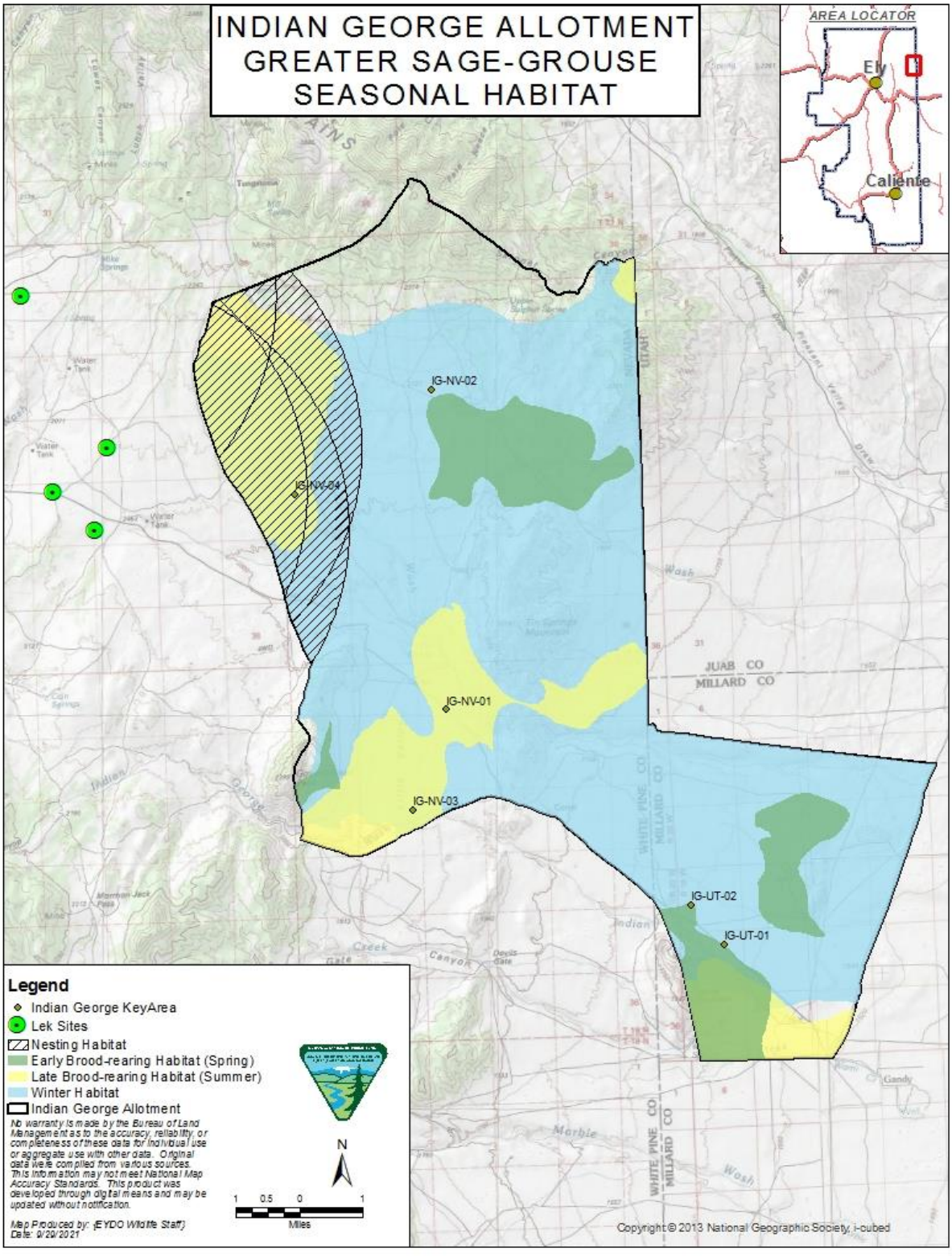


Figure 1.6 Greater Sage-grouse Seasonal Habitat Distributions.

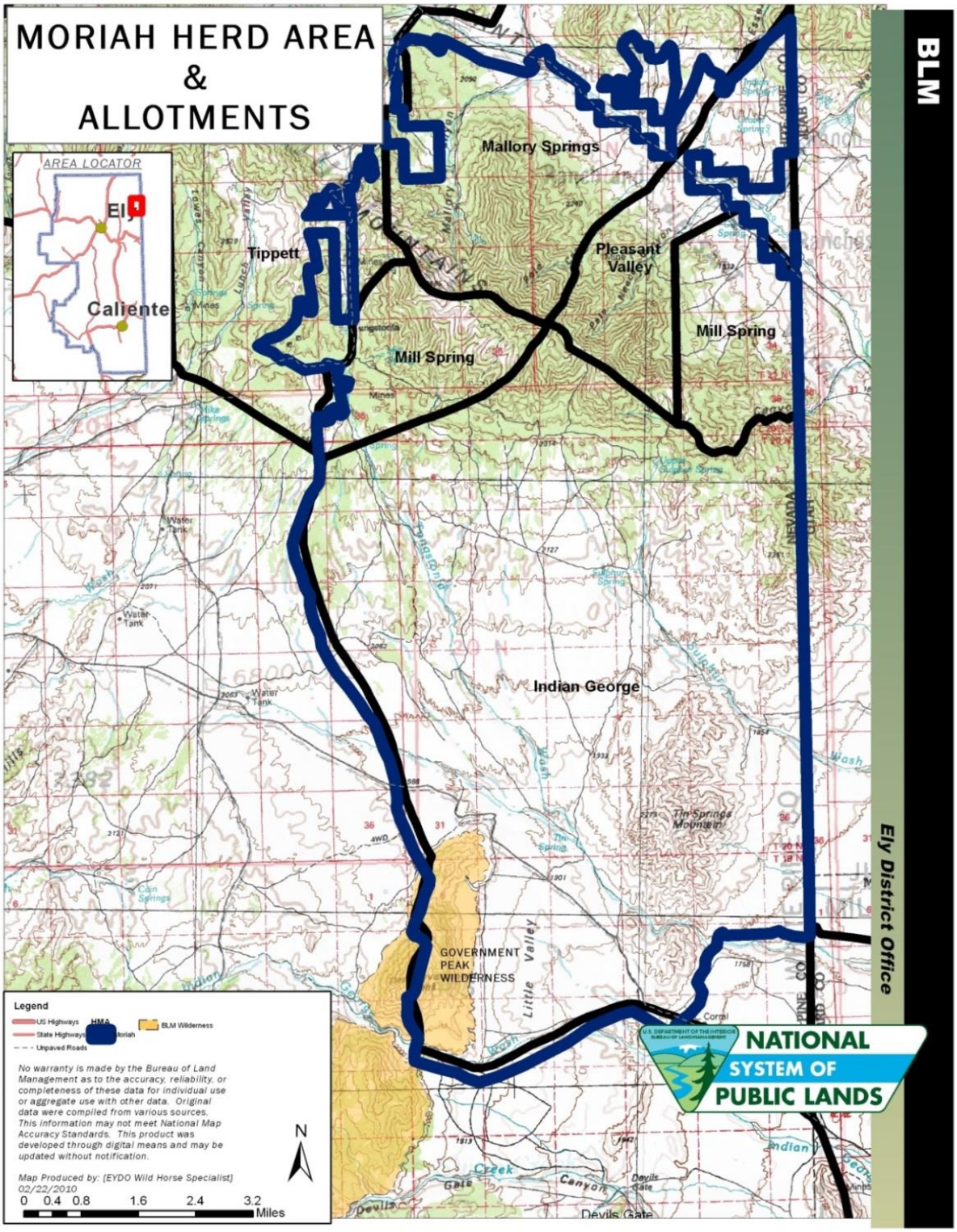


Figure 1.4. Moriah Wild Horse Herd Area.

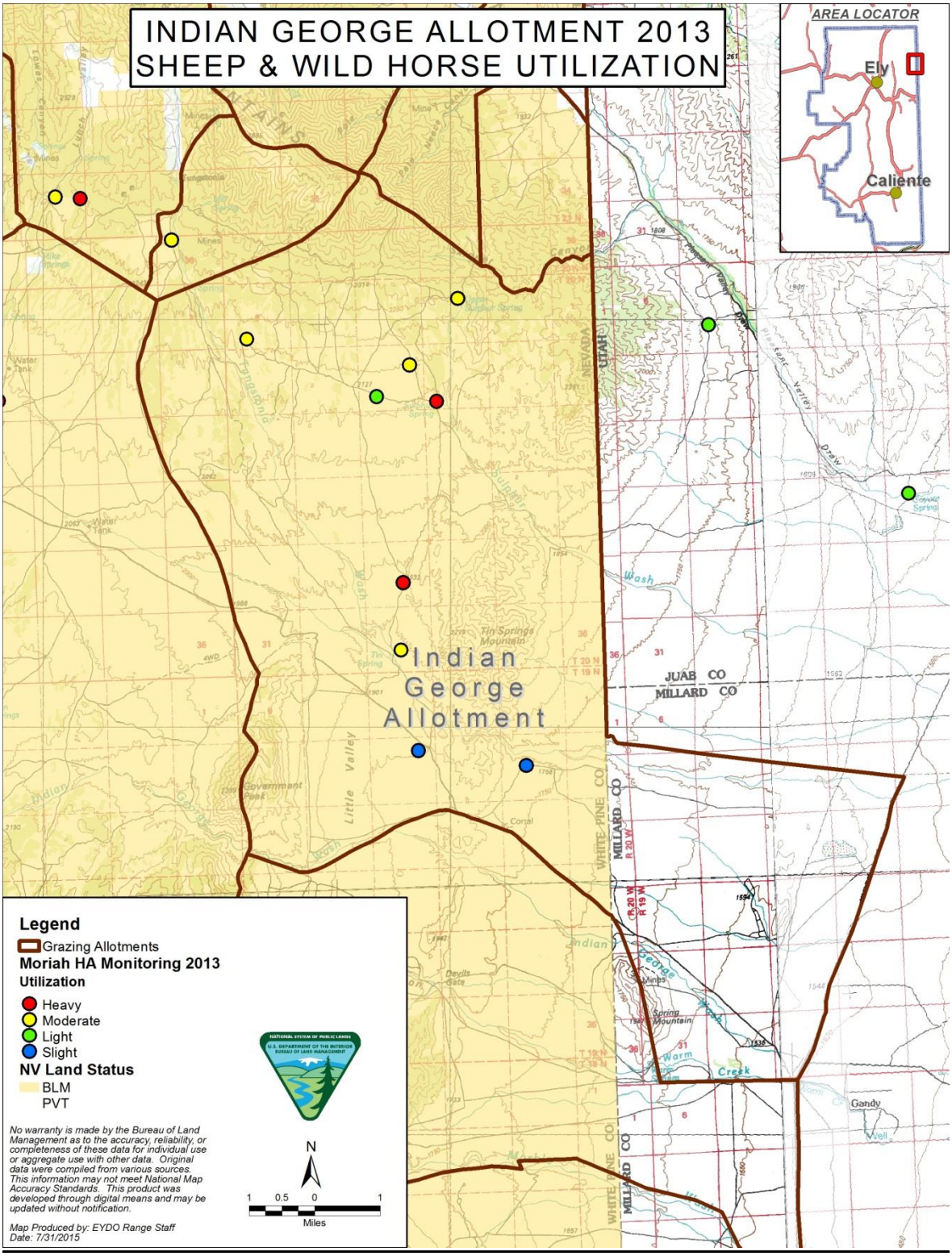


Figure 1.5. Wild Horse Utilization 2013.

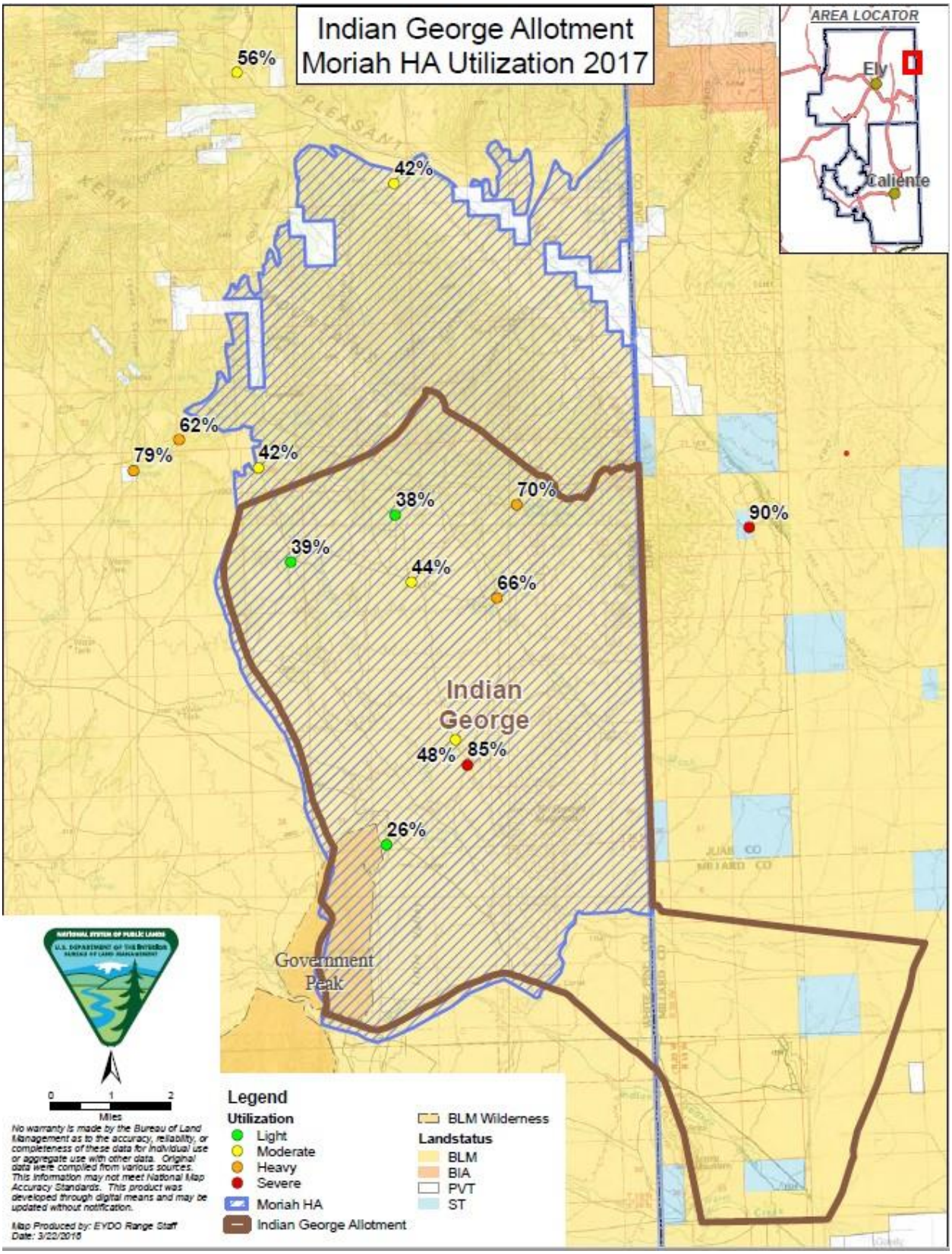


Figure 1.6. Moriah Wild Horse Herd Area Utilization 2017.

APPENDIX 2. PRECIPITATION DATA SUMMARY

The closest official weather station to the Indian George grazing allotment is located in Ibapah, Utah (NAD 83 Zone 12, 756009E 4432069N) at 5280 feet elevation. This station is located approximately 24 miles north of the allotment. Data at the station has been collected from 1903 to 2016. (This weather station is no longer active.) Average annual precipitation is 10.7 inches, with April and May having the highest precipitation totals. In the winter (November through March, precipitation averages 0.72 inches, with snowfall depths from 0-2 inches. Average monthly temperatures range from 10.0^0 F in January to 91.6^0 F in July. Recent drought years (2012 to 2014) had average yearly precipitation ranging from 6.4 inches to 9.3 inches. In 2015 and 2016, average yearly precipitation was 10.3 inches and 13.0 inches, respectively.

Analysis using the Rangeland Analysis Platform (RAP) for the period 1984 through 2020 (Figure 1.1) showed a downward trend in annual precipitation for the period in the Indian George allotment area. Mean annual temperature was 48.5^0 F. This decrease in precipitation may account for the downward trend in vegetation cover and composition.

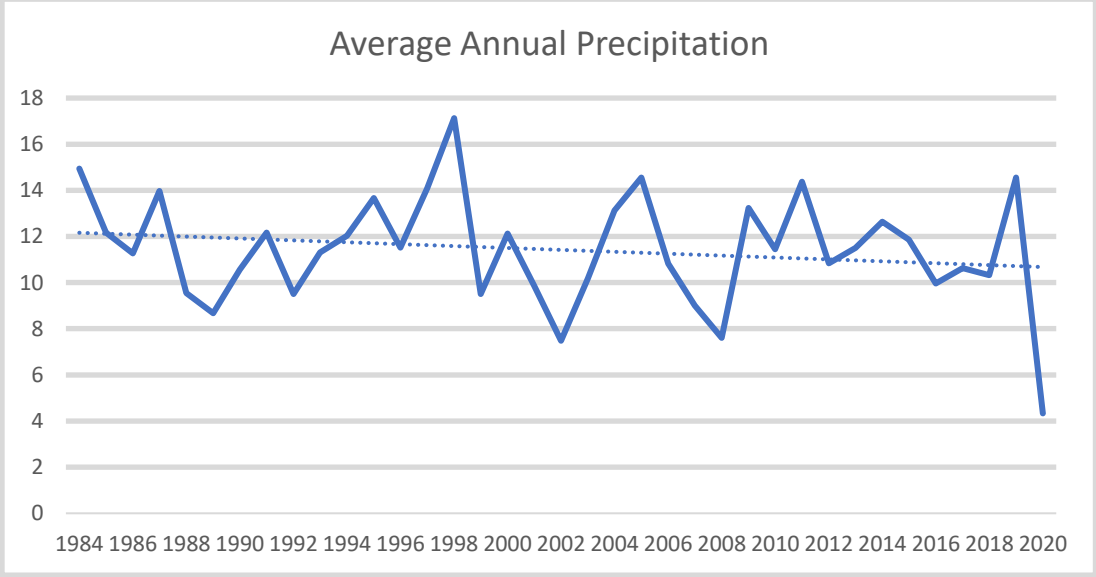


Figure 1.1 Average Annual Precipitation 1984-2020 (Rangeland Analysis Platform).

Year	Average Annual Precipitation	Average Annual Temperature
1984	14.94	45.6
1985	12.17	46.9
1986	11.26	49.2
1987	13.97	48.0
1988	9.54	48.2
1989	8.67	47.9
1990	10.56	47.9
1991	12.17	47.3
1992	9.5	48.7
1993	11.31	45.9
1994	12.03	48.9
1995	13.67	48.4
1996	11.51	49.3
1997	14.1	48.1
1998	17.13	47.3
1999	9.51	48.6
2000	12.12	49.4
2001	9.87	49.4
2002	7.48	47.8
2003	10.19	49.9
2004	13.13	47.9
2005	14.55	48.5
2006	10.82	48.2
2007	9	48.7
2008	7.61	47.4
2009	13.23	47.0
2010	11.45	47.4
2011	14.37	45.7
2012	10.84	50.7
2013	11.5	46.1
2014	12.64	49.6
2015	11.86	50.2
2016	9.96	49.6
2017	10.63	49.9
2018	10.33	49.4
2019	14.55	47.1
2020	4.33	49.3
AVERAGE	**11.42**	**48.2**

APPENDIX 3. SOILS

Table 3.1 shows the six major soil map units within the Indian George allotment. Soils in the Goshute Gravelly Loam-Dera Families association dominate the allotment (NRCS Soils Report 2021), representing approximately 22.3 percent of the area (Table 3.1). These soils are deep and found on alluvial fans and are derived from alluvium and/or lacustrine deposits derived from igneous and sedimentary rock on slopes from 2 to 8 percent. These soils are well-drained with calcium carbonate contents from 30-50 percent. They are associated with two ecological sites, and there are two monitoring sites in Utah associated with these soils.

The Summermute association has six Ecological Sites associated with them. These soils are found on fan remnants and are deep and well-drained. They are alluvium derived from limestone. Maximum calcium carbonate content is 45 percent. Soils within the Armespan-Gremmers association represent approximately 6.4 percent of the allotment, and soils of the Gremmers-Aremespan association represent 7.6 of the allotment. These soils are found on fan remnants and are deep and well-drained. Calcium carbonate content is 35 and 30 percent, respectively. Both are correlated to the Shallow Calcareous Loam 8-10" (R028AY013NV) ESD. There are three monitoring locations on this association. Soils within the Tarnach association, moist represent approximately 2.5 percent of the allotment. These soils are derived from colluvium, residuum and alluvium derived from limestone, calcareous sandstone and tuffaceous siltstone. These soils are found in mountains at slopes from 15 to 50 percent. These soils are well-drained and shallow (10-20 inches to lithic bedrock). The ecological site associated with this soil is Shallow Calcareous Slope 8-10" (R028AY004NV). There is one monitoring location in this association.

Table 2A. Soils within the Indian George Allotment.

Map Unit Symbol	Map Unit Name	Acres	Percent of Acreage	Key Areas within Map Unit
30*	Goshute Gravelly Loam-Dera Families association	10,405	22.3	2
3030**	Kyler-Amtoft-Rock Outcrop association	6,850	13.6	
1321**	Summermute association	3,804	8.2	
1304**	Gremmers-Armespan association	3,588	7.6	
1351**	Armespan-Gremmers association	3,523	6.4	3
4022**	Tarnach association, moist	1,700	2.5	1
	Other	22,702	39.4	
TOTAL		**52,572**	**100.0**	**6**

* Utah Order 4 Soil Survey - West Millard-Juab Area, Parts of Millard and Juab Counties
**Nevada Order 3 Soil Survey – White Pine County, Nevada, East Part

APPENDIX 4. VEGETATION MONITORING DATA

The Line-Point Intercept method measures soil cover, including vegetation, litter, rocks, and biological crusts (Herrick et al. 2016). Soil type and cover indicates water infiltration capacity, water evaporation, susceptibility to wind and water erosion, and ability of the site and its soil to resist and recover from degradation. Total cover by vegetation, litter, rocks, mosses, lichens, and biological crusts is positively correlated with soil and site stability and hydrologic function (Herrick et al. 2016). Plant cover is correlated to overall biotic integrity, plant production, nutrient cycling, and energy flow (Herrick et al. 2016).

Vegetation monitoring was conducted at six locations in the Indian George grazing allotment in 2011, 2014 and 2017. Table 4.1 shows the ESD, dominant species, soil map unit, and studies and analysis performed at these sites.

Table 4.1. Key Areas and Ecological Sites.

Key Area	Ecological Site	Ecological Site Description	Dominant Species	Soil Mapping Unit
IG-NV-01	R028AY013NV	Shallow Calcareous Loam 8-10"	Black sagebrush, Indian ricegrass	*1351* Armespan-Gremmers association
IG-NV-02	R028AY004NV	Shallow Calcareous Slope 8-10"	Black sagebrush, Indian ricegrass	*1351* Armespan-Gremmers association
IG-NV-03	R028AY013NV	Shallow Calcareous Loam 8-10"	Black sagebrush, Sandberg's bluegrass	*4022* Tarnach association
IG-NV-04	R028AY013NV	Shallow Calcareous Loam 8-10"	Black sagebrush, Indian ricegrass	*1351* Armespan-Gremmers association
IG-UT-01	028AY018NV*	Coarse Gravelly Loam 5-8"	Shadescale saltbush, Indian ricegrass	*1321* Summermute association
IG-UT-02	028AY018NV*	Coarse Gravelly Loam 5-8"	Shadescale saltbush, Indian ricegrass	*1321* Summermute association

*Soils and ESDs used for the Utah monitoring locations were those from adjacent data in Nevada.

Vegetation cover data from 2011 to 2017 is presented in Table 4.2 for the most recent data on Indian George. Data shown is calculated using values of the line intercept method to enable comparison with the ESDs for each site. Overall, data showed an increase in total vegetation cover in all sites but one and was within or exceeded the range of expected values for each ESD in 11 of the 13 sampling dates. Annual average precipitation was above average (11.2 inches) in 2011, average (9.9 inches) in 2014, and below average in 2017.

Table 4.2. Vegetation Cover Data Summary 2011 to 2017.

Key Area	Ecological Site	Expected Cover (%) Range	Total Cover (%) 2011	Total Cover (%) 2014	Total Cover (%) 2017
IG-NV-01	Shallow Calcareous Loam 8-10" P.Z. (R028AY013NV)	15-25	13		32
IG-NV-02	Shallow Calcareous Slope 8-10" P.Z. (R028AY0004NV)	5-15	33		
IG-NV-03	Shallow Calcareous Loam 8-10" P.Z. (R028AY013NV)	15-25	21	26	46
IG-NV-04	Shallow Calcareous Loam 8-10" P.Z. (R028AY013NV)	15-25	15	52	67
IG-UT-01	Coarse Gravelly Loam 5-8" P.Z. (R028AY018NV)	15-25	10	28	
IG-UT-02	Coarse Gravelly Loam 5-8" P.Z. (R028AY018NV)	15-25	10	52	

Cover data for **Key Area IG-NV-01** in the most recent year (2017) showed total vegetation cover of 32 percent. This value exceeded the expected range of values for the site. Total cover (including soil surface covered by rock, lichen, etc.) for the site was 73 percent.

Cover data for **Key Area IG-NV-03** in the most recent year (2017) showed total vegetation cover of 46 percent. This value exceeded the expected range of values for the site. Total cover (including soil surface covered by rock, lichen, etc.) for the site was 84 percent.

Cover data for **Key Area IG-NV-04** in the most recent year (2017) showed total vegetation cover of 67 percent. This value exceeded the expected range of values for the site. Total cover (including soil surface covered by rock, lichen, etc.) for the site was 118 percent.

Cover data for **Key Area IG-UT-01** in the most recent year (2014) showed total vegetation cover of 28 percent (increased from 2011). This value was above the expected range of values for the site. Total cover (including rock, lichen, etc.) for the site was 54 percent.

Cover data for **Key Area IG-UT-02** in the most recent year (2014) showed total vegetation cover of 52 percent (increased from 2011). This value was within the expected range of values for the site. Total cover (including rock, lichen, etc.) for the site was 63 percent.

Table 4.3 shows composition by major life form (grass, forb, shrub) to compare sites to its ESD for all monitoring sites on Indian George. Expected major life form and actual major life form are presented. Shrubs dominate five of the six sites. One key area (IG-NV-01) had a high grass composition. No forbs were detected on five of the six sites.

Tables 4.4 through 4.6 show vegetation cover and composition for recent monitoring data on Indian George. Data presents cover by specific category of life form. Composition was calculated using cover data. This data is used to compare expected and actual forms within each ESDs and determine the status of each site in their respective state and transition models.

Table 4.3. Expected and Actual Composition by Life Form.

		Expected Vegetation Composition by Life Form (%)			Actual Vegetation Composition by Life Form (%)		
Key Area	**Ecological Site Name**	**Grasses**	**Forbs**	**Shrubs**	**Grasses**	**Forbs**	**Shrubs**
IG-NV-01	Shallow Calcareous Loam 8-10" P.Z. *	45	10	45	62	0	38
IG-NV-02	Shallow Calcareous Slope 8-10" P.Z.*	40	5	55	18	0	82
IG-NV-03	Shallow Calcareous Loam 8-10" P.Z. *	45	10	45	34	0	66
IG-NV-04	Shallow Calcareous Loam 8-10" P.Z. *	45	10	45	25	2	73
IG-UT-01	Coarse Gravelly Loam 5-8" P.Z.*	55	5	40	20	0	80
IG-UT-02	Coarse Gravelly Loam 5-8" P.Z.*	55	5	40	30	0	70

*Trees (Utah Juniper) may constitute no more than 3 percent composition or a total of 15 percent of the aggregate with shrubs

Black sagebrush is expected to co-dominate with Indian ricegrass and needleandthread grass on **IG-NV-01**. Deep-rooted perennial grasses had high cover and composition values (8 percent cover, 9 percent composition) that indicate proper nutrient cycling, soil cover and water infiltration, and support wildlife and livestock nutritional needs. Indian ricegrass dominates the perennial grasses, and no needleandthread grass was present, although expected. Galleta grass and Sandberg's bluegrass were present at this site (both shallow-rooted perennial grasses). Data shows that the expected cover and composition of non-sprouting shrubs (i.e., black sagebrush, fourwing saltbush and others) was lower than expected. The sprouting shrub rubber rabbitbrush dominated the site and the shrub component of the site (9 percent cover, 28 percent composition). Non-native invasive plants (cheatgrass and Halogeton) are increasing in the site, as well, with a total composition of 37 percent of all vegetation. Shifts from expected life forms and values may be due to a fire in the area that occurred prior to 1984, drought and climate change. This increase in sprouting shrubs and non-native invasive annuals forbs and grasses indicate the site has shifted to an **at-risk state**.

Black sagebrush is expected to co-dominate with Indian ricegrass and needleandthread grass at **IG-NV-03**. Deep-rooted perennial grass cover was within expected values (4 percent cover, 9 percent composition). Deep-rooted perennial grasses indicate proper nutrient cycling, soil cover and water infiltration, and support livestock nutritional needs. Indian ricegrass dominates the perennial grasses, and no needleandthread grass was present. Data shows that the expected cover and composition of non-sprouting shrubs (i.e., black sagebrush, fourwing saltbush and others) (1 percent cover, 2 percent composition, respectively) was lower than expected. The sprouting shrub rubber rabbitbrush dominated the site and the shrub component of the site (13 percent cover, 28 percent composition). Non-native invasive plants (cheatgrass and Halogeton) are

increasing in the site, as well, with a total composition of 63 percent of all vegetation. Changes from expected life forms and values may be due to a fire in the area that occurred prior to 1984, drought and climate change. This increase in sprouting shrubs and non-native invasive annuals indicate the site had shifted to an **at-risk state (2.3)**.

Table 4.4. Vegetation Composition by Species for IG-NV-01 and IG-NV-03 (2017).

	IG-NV-01		IG-NV-03	
Functional Groups	**Cover (%)**	**Composition (%)**	**Cover (%)**	**Composition (%)**
Deep-rooted Perennial Grass	8	25	4	9
Shallow-rooted Perennial Grass	2	7	0	0
Non-Shrubs & Sub-shrub	1	3	1	2
Sprouting Shrub	9	28	13	28
Perennial Forb	0	0	0	0
Annual Forb	0	0	0	0
Non-native Invasive Annual Forb	1	3	0	0
Non-native Invasive Annual Grass	11	34	29	63

Figure 4.1. IG-NV-01 Monitoring Site 2017.

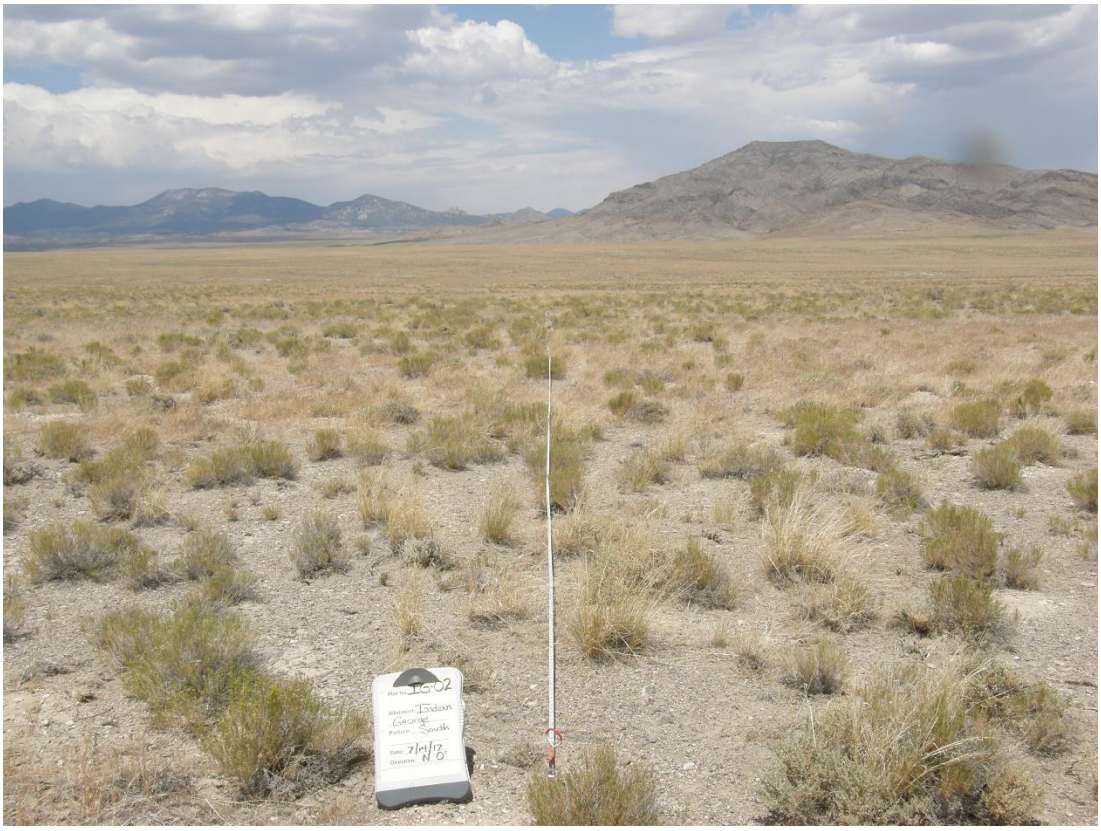


Figure 4.2. IG-NV-03 Monitoring Site 2017.

Black sagebrush is expected to co-dominate with Indian ricegrass and needleandthread grass on **IG-NV-04**. Deep-rooted perennial grass cover was within expected values (4 percent cover, 6 percent composition). Deep-rooted perennial grasses indicate proper nutrient cycling, soil cover and water infiltration, and support wildlife and livestock nutritional needs. Indian ricegrass dominates the perennial grasses, and no needleandthread grass was present. No shallow-rooted perennial grasses were present. Data shows that the expected cover and composition (7 percent cover, 11 percent composition) of non-sprouting shrubs (i.e., black sagebrush, fourwing saltbush and others) was dominant over deep-rooted perennial grasses. Sprouting shrubs (rubber rabbitbrush) cover and composition was moderate (8 percent, 12 percent, respectively). Non-native annual grasses were detected, but cover and composition was low (1 percent cover, 2 percent composition). This site is **Current Potential State 2.2.**

Table 4.5. Vegetation Cover and Composition for IG-NV-04 (2017).

	IG-NV-04	
Functional Groups	**Cover (%)**	**Composition (%)**
Deep-rooted Perennial Grass	4	6
Shallow-rooted Perennial Grass	0	0
Shrubs & sub-shrub	7	11
Sprouting Shrub	8	12
Perennial Forb	1	2
Annual Forbs	0	0
Non-native Invasive Annual Grass	1	2
Non-native Invasive Annual Grasses	45	67

Figure 4.3. IG-NV-04 Monitoring Site 2017 (Photo board Incorrect).

Shadscale saltbush and Indian ricegrass are the expected dominant species for IG-UT-01 and IG-UT-02. Data for **IG-UT-01** indicates that no Indian ricegrass was detected, and galleta grass was the dominant perennial grass species, composing 20 percent of total composition. Galleta grass is a rhizomatous species, shallow rooted species that is expected to be present, but low in cover and composition. The shift from the deep-rooted Indian ricegrass being dominant to shallow-rooted grass indicates a change in root structure that influences hydrological processes such as erosion and water infiltration. Shrubs/sub-shrubs (Shadscale, winterfat and bud sage dominate the community (80 percent of total composition). Rabbitbrush is expected as an increaser in this community signaling a decrease in ecological health, it was not detected in the 2014 monitoring. No non-native invasive annual forbs or grasses were present. This site is in **Reference State 1.3**.

Shadscale dominates **IG-UT-02** (7 percent cover, 70 percent composition) and Indian ricegrass represented 20 percent of the composition (2 percent cover). Fluff grass was the other perennial grass species present (1 percent cover, 10 percent composition). No non-native invasive annual forbs or grasses were present at the site. Since non-sprouting shrubs are becoming dominant and grasses are still represented with no non-native invasive annuals, this site is in **Reference State 1.3**.

Table 4.6. Vegetation Cover and Composition for IG-UT-01 and IG-UT-02 (2014).

	IG-UT-01		IG-UT-02	
Functional Groups	**Cover (%)**	**Composition (%)**	**Cover (%)**	**Composition (%)**
Deep-rooted Perennial Grasses	0	0	2	20
Shallow-rooted Perennial Grasses	2	20	1	10
Non-sprouting Shrubs & Sub-shrubs	8	80	7	70
Sprouting Shrubs	0	0	0	0
Perennial Forbs	0	0	0	0
Annual Forbs	0	0	0	0
Non-native Invasive Annual Forbs	0	0	0	0
Non-native Invasive Annual Grasses	0	0	0	0

RANGELAND ANALYSIS PLATFORM DATA

The Rangeland Analysis Platform (RAP) (https://rangelands.app) was used to analyze vegetation and is presented below**.** Analysis using the RAP was performed separately in Utah and Nevada because the available soils and ESD spatial data for each state differ in spatial scale.

Two major ESDs within the Nevada portion of the allotment were used in the RAP analysis, Shallow Calcareous Loam 8-10" P.Z. (R028AY013NV) and Shallow Calcareous Slope 8-10" P.Z. (R028AY004NV). These ESDs represent 11,459 acres (22 percent of the allotment) and 14,532 acres (28 percent of the allotment), respectively. One major Soil Map Unit (SMU 30) in Utah was used in the analysis representing 31 percent of the allotment.

RAP analysis results are shown below. Figure**s** 4.4 through 4.12 show the changes in vegetation cover categories by plant life form (annual forbs and grasses, perennial forbs and grasses, shrubs, and trees) as well as the amount of bare ground.

Vegetation cover analysis for annual plants in the dominant ESDs and soil map unit in Indian George are shown in Figures 4.1 and 4.2). Annual forb and grass cover on the major ESDs in Nevada and soil in Utah showed an increase trend.

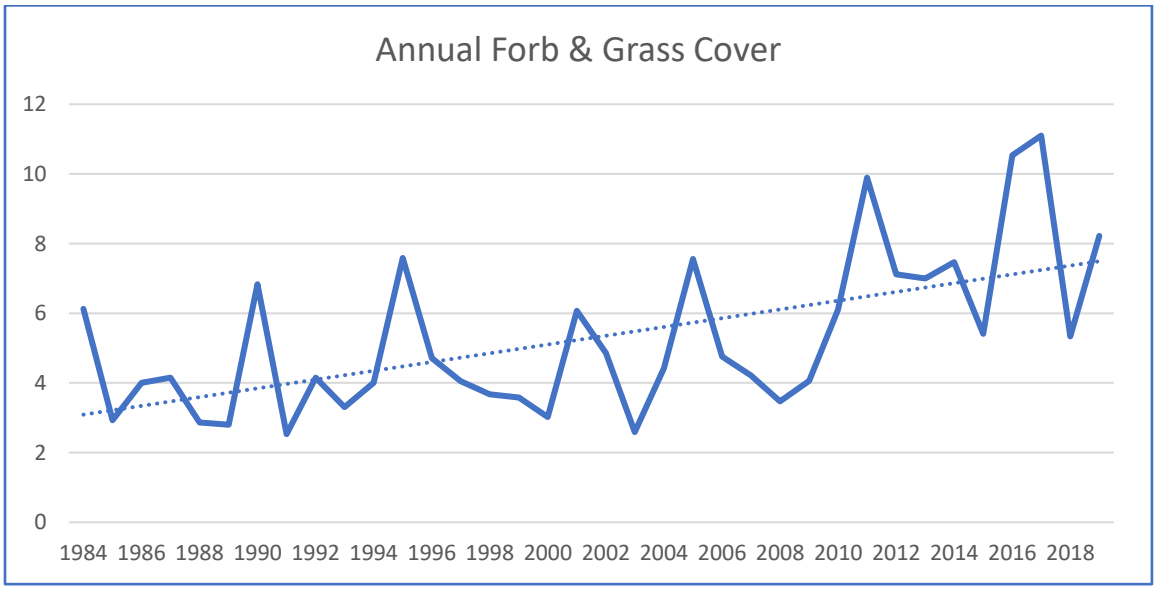


Figure 4.4. Annual Forb and Grass Cover for Major Ecological Sites in Nevada 1984-2018.

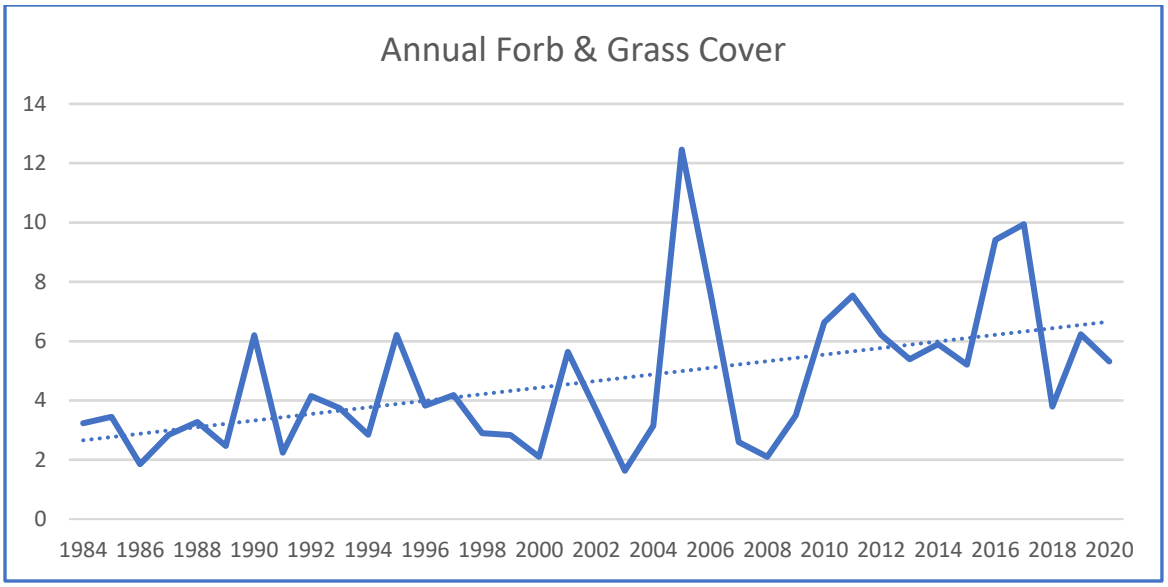


Figure 4.5. Annual Forb and Grass Cover for Major Soil Map Unit in Utah 1984-2020.

Vegetation cover analysis for perennial plants in the dominant ESDs and soil map unit in Indian George are shown in Figures 4.3 and 4.4. Perennial forb and grass cover on the major ESDs in Nevada and soil in Utah showed a slight decrease over the period of analysis.

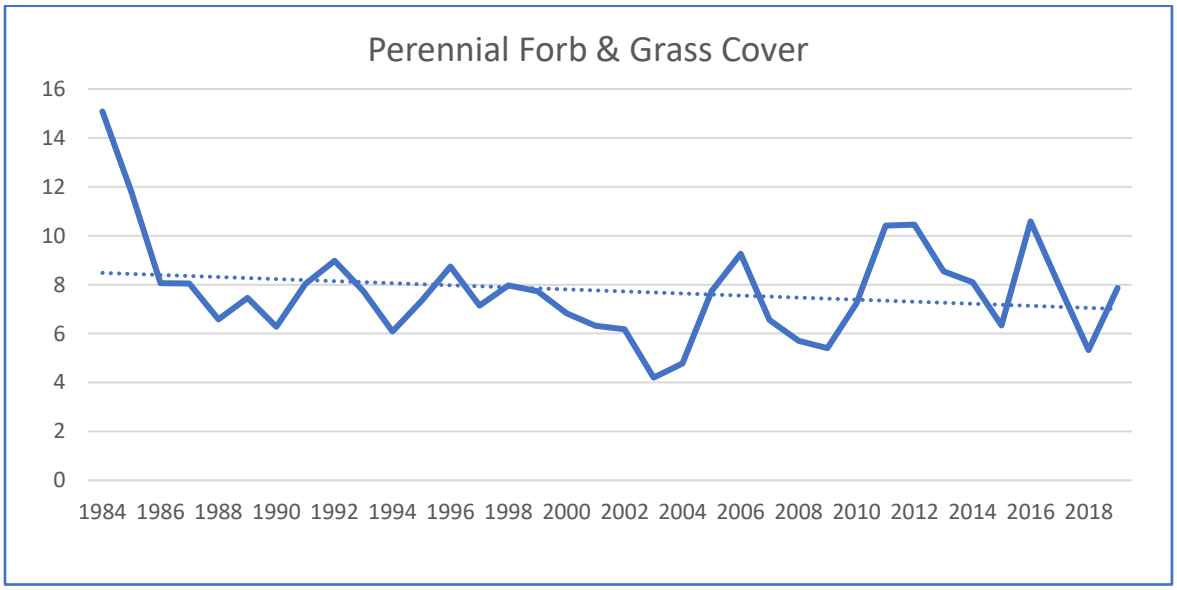


Figure 4.6. Perennial Forb and Grass Cover for Major Ecological Sites in Nevada 1984-2018.

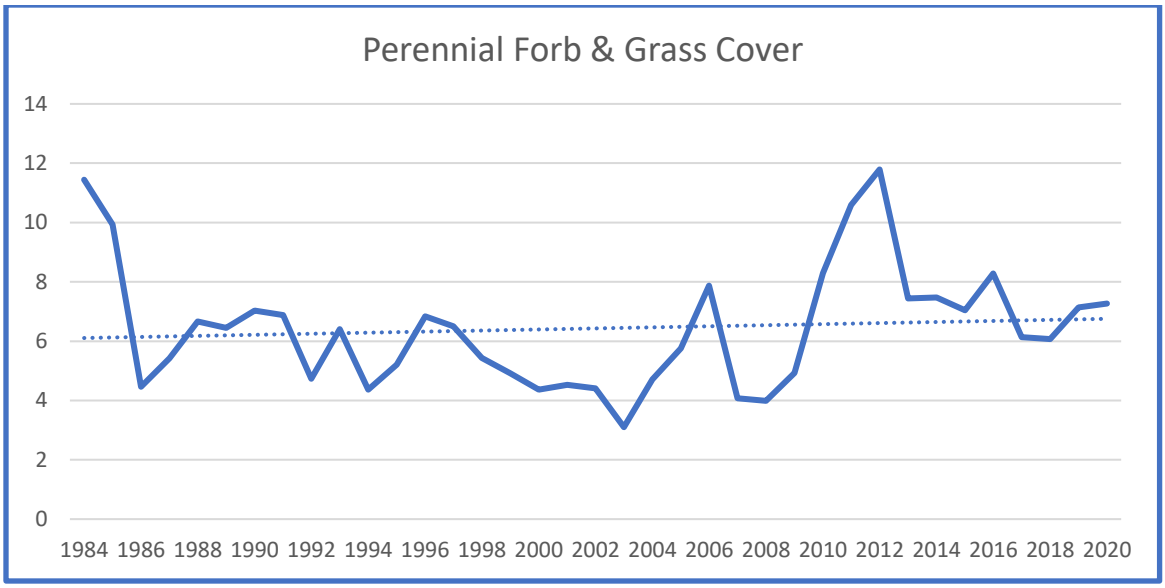


Figure 4.7. Perennial Forb and Grass Cover for Major Soil Map Unit in Utah 1984-2020.

Vegetation cover analysis for shrubs in the dominant ESDs and soil map unit in Indian George are shown in Figures 4.5 and 4.6. Shrub cover on the major ESDs in Nevada remained relatively stable and show an increase in trend in the major soil map unit in Utah.

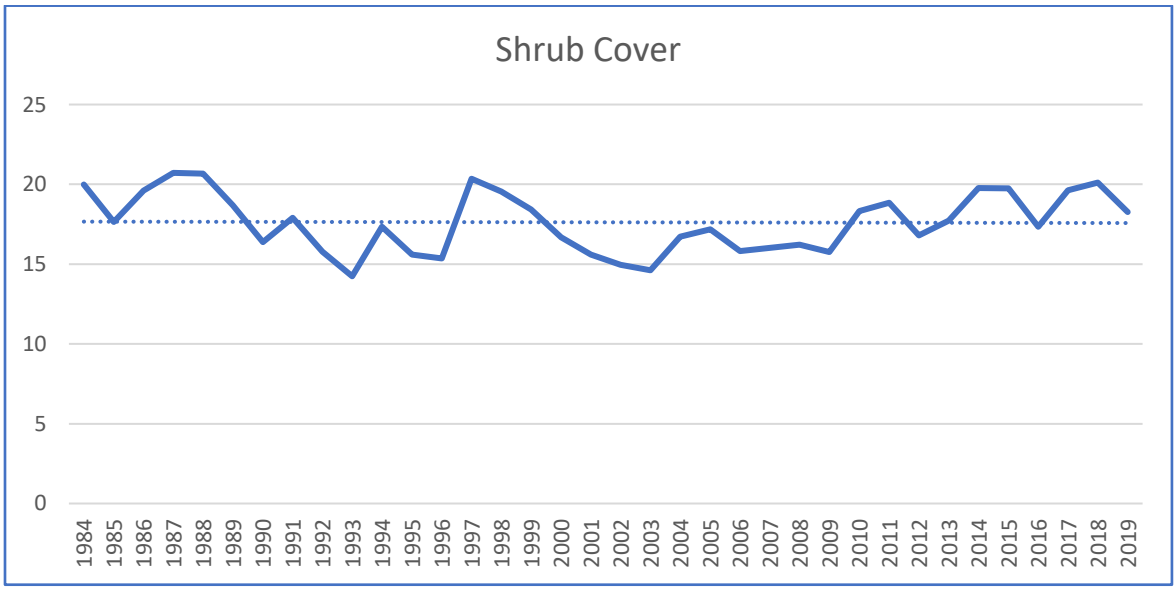


Figure 4.8. Shrub Cover for Major Ecological Sites in Nevada 1984-2019.

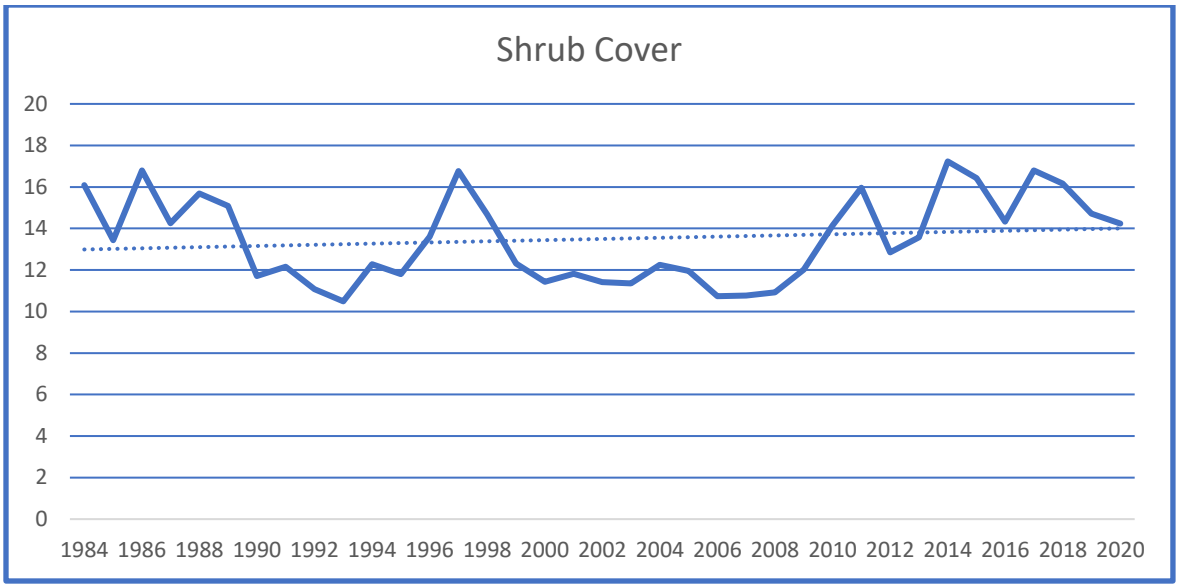


Figure 4.9. Shrub Cover for Major Soil Map Unit in Utah 1984-2020.

Vegetation cover analysis for trees in the dominant ESDs was only conducted in the Nevada portion of the allotment. (Figures 4.8). Trees are not expected or present in the major SMU and ESD in Utah. Analysis shows an increase of tree cover trend.

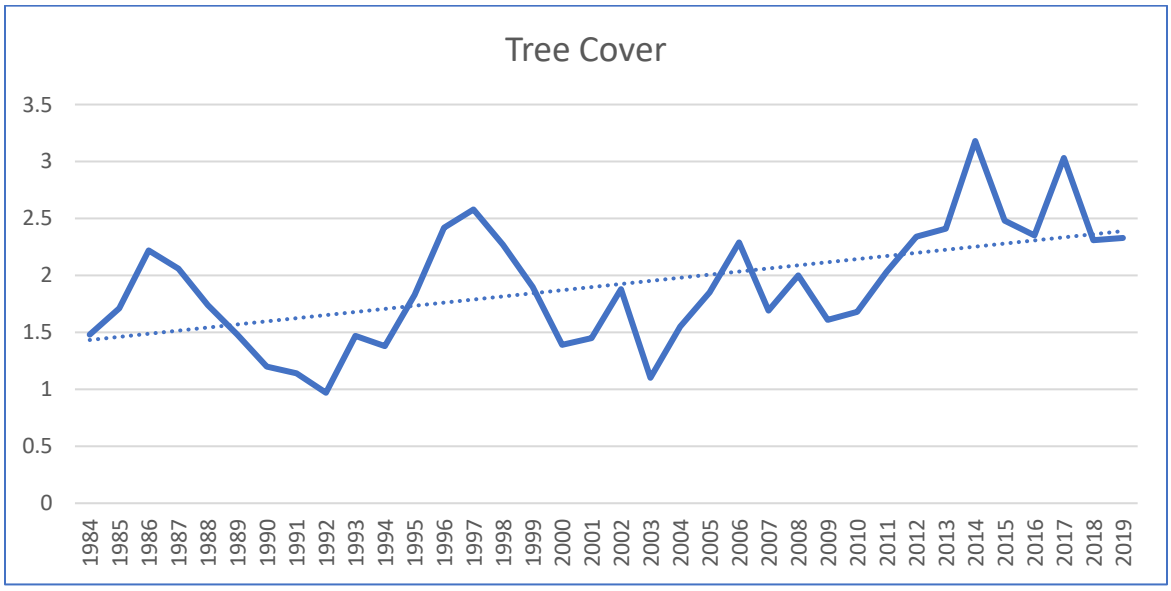


Figure 4.10. Tree Cover for Major Ecological Sites within Nevada 1984-2020.

Bare ground in both the Nevada and Utah portions of the allotment where analysis was conducted both show a trend of decreasing values (Figures 4.9 and 4.10).

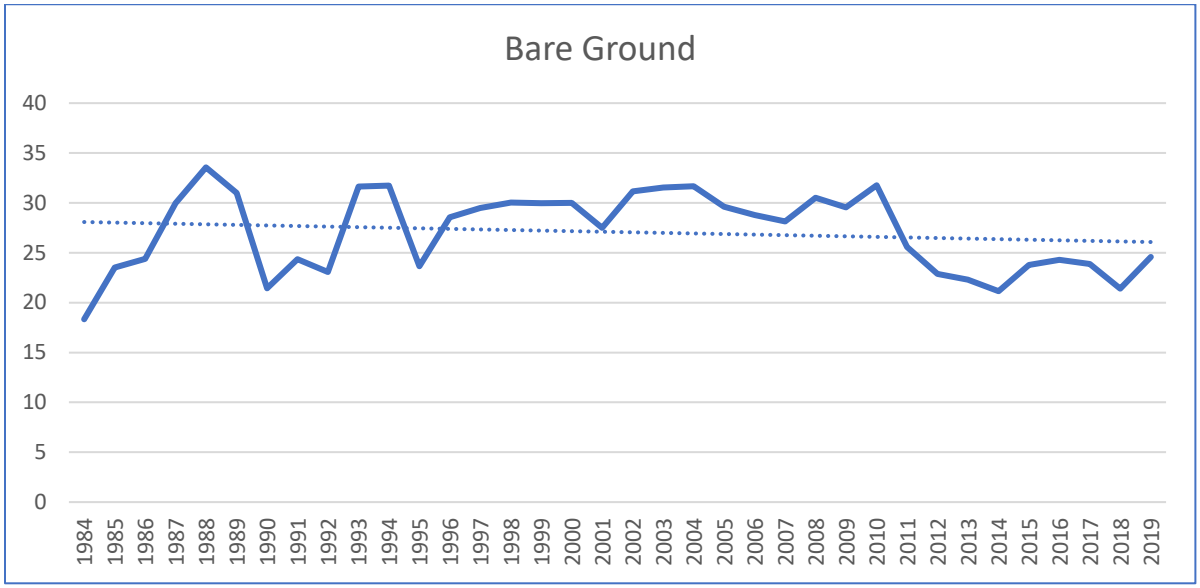


Figure 4.11. Bare Ground for Major Ecological Sites in Nevada 1984-2019.

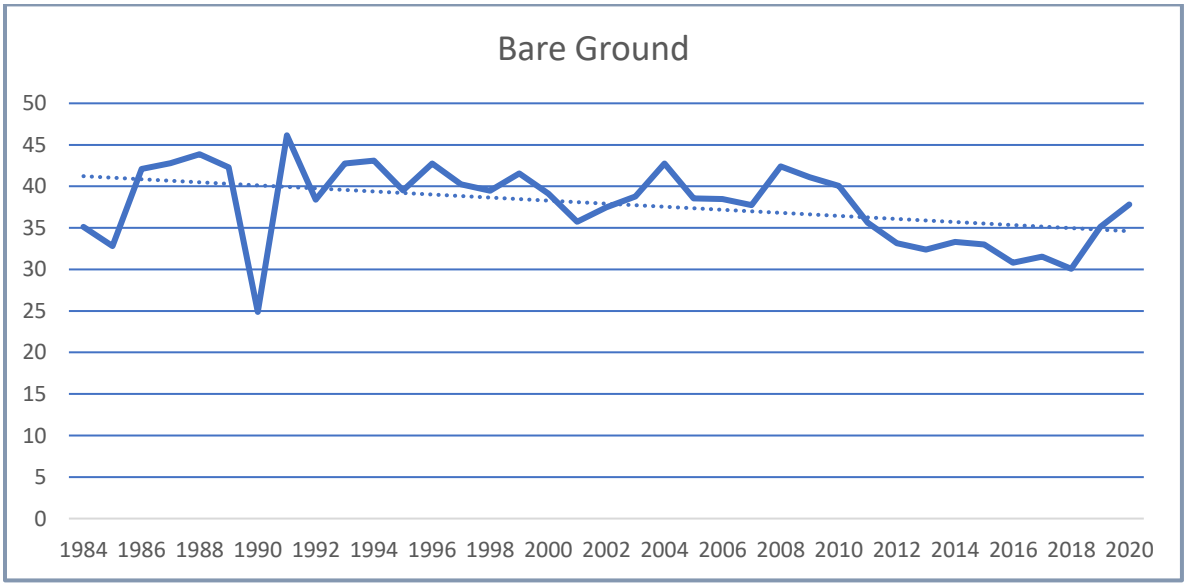


Figure 4.12. Bare Ground for Major Soil Map Unit in Utah 1984-2020.

APPENDIX 5. RIPARIAN DATA MONITORING SUMMARY

There are six springs on the Indian George allotment (Figure 1.3)(Table 5.1). Four of these springs have protective fences, although one periodically is torn down by wild horses. One is ephemeral. These four springs flow into small meadows (<1 acre) and reservoirs which are all used by wild horses, livestock, and elk. One spring in the northwest of the allotment has no fence around it. Although water was present in the spring of 2009 (Figure 3.8) and 2019, it was not present in the fall of 2020. Spring assessments from 2009, 2011 and 2020 show that the springs within intact fenced areas have continued to be functioning properly (PFC). The other two have deteriorated due to the presence of wild horses and elk, and the expansion of pinyon and juniper trees in the area. Livestock were also included in the assessment of the broken fenced area in 2011. Figures 5.1 through 5.8 show each spring.

Table 5.1. Riparian Areas within the Indian George Grazing Allotment.

Name	Protected (yes/no)	Location	Assessment Date	Rating
Upper Sulphur Spring	yes	T20N R70E Sec 10 SWNE	1/19/2009	PFC
			10/27/2011	PFC
			7/24/2020	PFC
Lower Sulphur Spring*	yes	T20N R70E Sec 10 SWSW	9/1/2009	PFC
			10/27/2011	PFC
			7/24/2020	PFC
Tin Spring	no	T20N R70E Sec 33 NWSW	10/27/2011	FAR
			11/20/2019	None - no water or riparian vegetation present
			7/24/2020	None - no water or riparian vegetation present
Unnamed Spring (aka: Tin Spring)	yes	T20N R70E Sec 28 NWSE	10/27/2011	FAR
			7/24/2020	None – spring developed*
Unnamed Spring East	yes	T20N R70E Sec 28 NWSE	8/13/2009	PFC
			12/1/2011	NF
			7/24/2020	FAR – no water present
Unnamed Spring West	no	T20N R69E Sec 1 NWNE	8/13/2009	PFC
			12/1/2011	NF
			5/14/2020	None; water present
			9/25/2020	None; no water present

*Pipeline to an old trough exists, however field review could not determine if there is a spring box in the source.

Upper and Lower Sulphur Springs were rated Properly Functioning in 2009, 2011, and 2020. Tin Spring no longer has water or remnant riparian facultative or obligative vegetation. It appears this spring is dry. It was reviewed in 2011, 2019, and 2020. Water was not present at any of these field reviews. The unnamed spring mistakenly named Tin Spring in the past, is located on the west side of the Tin Springs Mountains. It is fenced and was developed at one time; however, the development of the pipeline to the trough is not functioning. It is fenced, but the fence is not excluding wild horses and they are impacting the spring and riparian area heavily through trampling. Its capability has been significantly reduced. Another unnamed spring south of that spring on the west side of the Tin Springs Mountains [Unnamed Spring (SE)] is ephemeral and protected by a fence. There is an unnamed spring in the northwest of the allotment (Unnamed Spring NW) in the upper Tungstonia Wash that is also ephemeral. Though riparian plant species occur at Unnamed Spring West such as sedge and facultative wetland plants such as wild rose, they were not present in quantities that are consistent with a functional riparian plant community. The spring-fed stream channel appears to be cutting down to bed rock based on the presence of eroded, high gradient stream banks and a lack of stream channel sinuosity. The lack of vegetation and the excessive gradient of the stream banks appear to be the result of trampling from excessive wild horse and elk use. Pinyon and juniper infilling has occurred in the vicinity as well. Therefore, the standard is not being achieved.

Figure 5.1. Upper Sulphur Spring Reservoir Looking South.

Figure 5.2. Upper Sulphur Spring Looking East.

Figure 5.3. Lower Sulphur Spring.

Figure 5.4. Unnamed Spring (aka: Tin Spring) Overview.

Figure 5.5. Unnamed Spring (aka: Tin Spring) Source.

Figure 5.6. Unnamed Spring East Looking West.

Figure 5.7. Unnamed Spring East Looking East.

Figure 5.8. Unnamed Spring West (2009).

Upper Sulphur, Lower Sulphur, an Unnamed Spring East (aka: Tin Spring), and Unnamed Spring West in the southeast of the allotment have fences designed to protect the spring sources. Three fences need new designs and installation. The fence at Upper Sulphur Spring was installed in July 2006. However, this fence and the one at Lower Sulphur Spring (no installation information available) need repair and to be expanded to continue protection of their spring sources, riparian vegetation immediately around them, and for short distances in their respective riparian areas. The fence around the Unnamed Spring East (aka: Tin Spring) is periodically torn down by wild horses and is repaired only to be torn down again. This fence needs a new configuration that protects the spring source and riparian vegetation immediately around it and down slope until the water goes into either the existing reservoir or is connected to an existing tank. This fence needs to be a smaller area to discourages horses from entering the protected area; but allows water to be available to wildlife. There is a non-functional pipeline to a non-functional trough and reservoir that comes from the spring sources. It is unclear if a spring box exists or if the pipeline comes directly from the source. The fence around Unnamed Spring East is functioning.

APPENDIX 6. LIVESTOCK GRAZING USE

The Need More Sheep Company is permitted for 2860 AUMs each year. They have consistently used less AUMs than permitted (Table 4A). In 2020, 83 percent of their AUMs were utilized, and in 2008 they only used 34 percent as the least AUMs. Average use over the 14-year period was 53%.

Table 6.1. Actual Grazing Use on the Indian George Grazing Allotment 2007-2020.

Year	AUMs	Percent of Total Active AUMs	Dates of Use
2007	1,039	36	01/01 to 02/28
2008	981	34	11/01 to 03/31
2009	2,349	82	02/01 to 03/31
2010	1707	60	11/01 to 03/25
2011	694	24	11/16 to 03/31
2012	1236	43	11/17 to 03/31
2013	1441	50	10/18 to 03/19
2014	1587	55	11/10 to 03/30
2015	1632	57	11/10 to 03/30
2016	1517	53	11/05 to 04/11
2017	1758	61	10/25 to 04/11
2018	1443	50	11/15 to04/15
2019	1545	54	10/28 to 4/10
2020	2376	83	11/16 to 4/12

Wild horse and sheep grazing utilization data was collected using the key forage method between 2013 and 2019. Utilization varied between sites from 10 percent to 76 percent. Average utilization levels for the allotment were 23 percent for shrub species and 40 percent for grasses. When grazing use pattern maps were compared for all years, there was consistent data showing the most grazing use occurs in the central portion of the allotment within the Nevada portion of the allotment.

Wild horse census data combined with utilization studies and professional observations indicate that wild horses have contributed to heavy and severe use levels of key forage plants in many areas, especially in the central portion of the Nevada side. Wild horse census flights were conducted in March 2021 that recorded a direct count of 459 wild horses in and outside the Moriah Herd Area (HA). The appropriate management level (AML) for the Moriah Herd Area is zero or no wild horses, as established by the Ely District ROD/RMP (August 2008). Many, if not most, of the severely degraded native rangelands on the Indian George Allotment are used by elk and wild horses year-long (Figures 1.5 and 1.6). Severely depleted rangelands in the center of the allotment are dominated by non-native invasive annuals.

Table 6.2. Grazing Use on the Indian George Allotment 2013-2019.

Year	Key Forage Species		Average Utilization (%)	
2013	ATCO	ACHY	20	26
	ARNO4	HECO2	13	48
2014		HECO2		22
	ARNO4	ACHY	15	28
2017	ARNO4	ACHY	14	34
2018	ARNO4	ACHY	12	58
2019	ARNO4	ACHY	10	64
	KRLA2		76	