

Baseline Horse Springs Allotment

Allotment Management Plan

U.S.D.A. Forest Service
Apache-Sitgreaves National Forest
Clifton Ranger District

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Baseline / Horse Springs Allotment Management Plan

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I. Allotment Description

The Baseline and Horse Springs Allotments on the Clifton Ranger District of the Apache Sitgreaves National Forest encompass approximately 5828 acres (Baseline) and 3508 acres (Horse Springs) in the pinyon-juniper woodland and grassland zones (Management Areas 2 and 4 of the Apache-Sitgreaves National Forest Land and Resource Management Plan) varying in elevation from 4800 to 6400 feet. Both Allotments border Eagle Creek along the San Carlos Reservation/Apache National Forest Boundary. Precipitation in the Eagle Creek area is primarily from summer rains which occur in July, August and September. Winter precipitation is moderate, with scattered showers and light snow fall. Precipitation averages about 12-16 inches annually.

Primary use of the Baseline and Horse Springs Allotments has been for livestock grazing since establishment of the grazing permit in the early 1920's. The Baseline Allotment has been under a three pasture rest rotation livestock management system since 1972. Under this management system livestock use within each of the primary pastures is 6 months, followed by one year of rest. Livestock numbers on the Baseline Allotment were 117 head of cattle (cow/calf) from 3/1 to 2/28 annually or 1,879 Animal Unit Months. The Horse Springs Allotment has been under a three pasture deferred rotation livestock management system since 1980. Under this management system two of the three pastures receives growing season rest annually, and one of the three pastures receives dormant season rest annually. Livestock numbers on the Horse Springs Allotment were 71 head of cattle (cow/calf) from 3/1 to 2/28 annually or 1,140 Animal Unit Months.

II. Purpose and Need for the Allotment Management Plan

A Decision Notice and Finding of No significant Impact was signed on January 20, 1998. This decision document approved development of an Allotment Management Plan for livestock use on the Baseline and Horse Springs Allotments, Clifton Ranger District, Greenlee County, Arizona. Concurrently with Allotment Management Plan development, the decision authorized modification of the Term Grazing Permit for variable numbers and class of livestock for 242 days between September 1 and May 30 annually. The Allotment Management Plan addresses both range improvements and the grazing program needed to achieve objectives and provide for livestock production. The grazing program uses a seven pasture, seasonal deferred rotation schedule designed to maximize rest for plant re-growth while optimizing grazing by livestock in most dormant growth seasons of forage plants.

The purpose of this Allotment Management Plan is to achieve established goals for the land based area, and implement the direction in the Apache-Sitgreaves National Forest Plan (including compliance with applicable laws, regulations and policies) in the grazing permit authorizing livestock use on the Baseline and Horse Springs Allotments.

The need for this Allotment Management Plan is to move from existing resource conditions toward desired resource conditions by meeting identified objectives as stated in the planning process and within the Apache-Sitgreaves National Forest Land and Resource Management Plan, as amended. The Allotment Management Plan is designed to address resource concerns as they relate to soil productivity, watershed condition, intermittent/ephemeral riparian retention and protection, and threatened, endangered, and sensitive species habitat enhancement and protection.

A. Goals for the Baseline/Horse Springs Allotment

Life Value Goal - The Baseline/Horse Springs Allotments should offer the opportunity for people living and working closely with the resources, improving the whole, sustaining for themselves and the future, the simple/complex production cycle all life forms depend on. The rural western heritage life style should be maintained for the users of the land area, while diverse interests continue to be represented in a collaborative and effective management effort.

Production Goal - Various products should come from the Baseline and Horse Springs Allotments to support identified life values. Healthy populations of key wildlife species, especially deer, eagles, water birds, spike dace, beaver, turkey, antelope, javelina, song birds, black bear, Mearns quail, coyotes, rabbits, insects, and elk. Increased diversity of plants and animals associated with the land area. Overall improvement of watershed conditions, with healthy riparian areas, and production of more water of a higher quality. Overall improvement of forage, with a decrease in the distances between plants, a better balance of cool and warm season grasses, and production of more forage of a higher quality for both wildlife and livestock.

Provide profit from various rural opportunities such as livestock production, and huntable wildlife populations. Non consumptive uses of the land for recreation opportunities such as picnicking, rock hunting, bird watching, hiking, backpacking, and camping should be provided. Aesthetics, and visual diversity are important factors in producing these products. Heritage resources/traditional cultural property inventory and protection should be provided for future educational opportunities

Desired Landscape Goal - Create a diverse mosaic of vegetative communities, multiple age classes of mixed broadleaf species in riparian areas, healthy and sustainable balance of grasslands, pinyon, juniper and browse communities. Increase desirable browse species such as cliff rose, mountain mahogany, and four wing salt bush. Improve diversity of grass species and balance cool and warm season grasses. Provide for succession of vertic soils to improve stability and productivity. Maintain an "open space" concept across the landscape.

B. Existing Resource Condition - The Baseline/Horse Springs Allotment is a predominately open alligator juniper woodland with the remaining area grassland. Portions of the open alligator juniper woodland has become a closed canopy association. Browse communities are mainly confined to the drainages and side slopes. The drainages are all ephemeral or intermittent. This narrative discusses existing ecological conditions of the Baseline/Horse Springs Allotments, including vegetation composition and condition, serial stages, herbaceous cover and riparian conditions. The existing vegetation types or associations represented are as follows:

Associations	Acres	% of Area	Map Color
Mixed Broadleaf Riparian	138 acres	01%	Blue
Grassland	1,590 acres	17%	Orange

Alligator Juniper Woodland	4,834 acres	51%	Green
Pinyon- Juniper/Oak/Beargrass	1,744 acres	18%	Red
One-seed Juniper Woodland	1,188 acres	13%	Purple
Total	9,494 acres	100%	

Riparian

Dominant ephemeral riparian communities on the allotments are Eagle Creek, Bear Canyon, Bee Canyon, and Big Dry Canyon. Riparian associations account for approximately 138 acres or 1% of the land area. All drainages on the Allotments are divided in either an intermittent riparian type or an ephemeral riparian type.

Overstory species within Eagle Creek are Arizona sycamore and narrowleaf cottonwood (*Populus angustifolia*). These are mainly large older age trees with limited regeneration, much of which is periodically depleted by high water events. Understory species consist of dispersed Arizona walnut, boxelder, and alder (*Alnus oblongifolia*). Canopy cover varies, but averages 50-60%. Substrate consists of small to large rocks interspersed with gravel bars and bedrock. The three primary reaches of Eagle Creek include the upper reach near Honeymoon Campground, the middle reach, and the lower reach from Sheep Wash to the Gila River. The Baseline and Horse Springs Allotments are within the middle intermittent stream reach of Eagle Creek. Both the upper and lower stream reaches of Eagle Creek are perennial flow. Eagle Creek has been significantly impacted by large flood events within the last 5 years. Fifty percent of the Eagle Creek watershed is Forest System Lands and fifty percent are lands of the San Carlos Reservation. Portions of Eagle Creek, throughout its length, are located alternately on Forest Service lands, private lands and lands of the San Carlos Reservation. The primary impacts of concern associated with the riparian function and condition of Eagle Creek are contributed by diminished watershed conditions and sediment flow into the riparian system. Secondary impacts applicable to the middle stream reach is the influence of increased sediment into the system contributed by area roads, and livestock concentration impacts within the riparian zone on non forest lands. The creek is an important resource which is the focal point to the many private landowners who reside along its banks. Eagle Creek is also one of the few streams in the Southwest that still contains a predominantly native fish population.

Bear Canyon, Bee Canyon and Big Dry Canyon are similar in nature. Overstory species consist of sapling to mature Arizona walnut, willow species, boxelder, ash (*Fraxinus* spp.), gray oak, and widely scattered Arizona sycamore. Canopy cover is generally low (10-20%). Regeneration of riparian species is low. In many areas there is abundant growth of rabbitbrush (*Chrysothamnus* spp.). Terrace vegetation varies, but consists of combinations of juniper, pinyon, gray oak, desert ceanothus and squawbush (*Rhus trilobata*). The pinyon and juniper is primarily young to mid-age. The slopes of the drainages are usually gently sloping and shallow to moderately deep. These are all ephemeral and intermittent streams.

The remaining drainages are all ephemeral with few riparian species. Woody species within these drainages are similar to the uplands, with heavier canopy. Riparian inclusions include scattered Arizona walnut, boxelder, and ash. Canopy closures are generally low to moderate (10-40%). Substrate consists of cobble and large rock.

Grassland

The grassland association is interspersed between canyons and pinyon/juniper woodlands. These grasslands vary in composition and nature. The grassland association covers approximately 1590 acres or 17% of the land area and is separated into two distinct types. The Alligator juniper woodland association also includes substantial amounts of semi-open grassland with low tree density.

The area directly east of lower Bear Canyon is characterized as a hairy grama, wolftail, and sideoats grama (Bouteloua hirsuta, Lycurus phleoides, Bouteloua curtipendula) grassland type. This type represents 777 acres or 8% of the land area. Herbaceous ground cover is 60-70% with the remainder consisting of bare ground and rock. Grass vigor is fair to good. Diversity within this community is also fair to good with several other grass and forb species represented.

The area on the northwest side of Bear Canyon is characterized as a blue grama, sideoats grama, bottlebrush squirreltail (B. gracilis, B. curtipendula, Sitanion hystrix) grassland type with a mesquite overstory. This type represents 813 acres or 9% of the land area. Many of the vertic soils occur within this grassland type. Goldeneye (Viguiera annua) is common, found on open disturbed soil sites on ridges, plains, and bottomlands. Grass vigor is poor, and erosion is evident within this type.

The open alligator juniper woodland/grassland type is characterized by sideoats grama, hairy grama, three-awn (Aristida spp.), wolftail, and squirreltail. Goldeneye is common within much of this type. On areas where goldeneye is present grass vigor is poor, there is a high percentage of annuals, a high percentage of broom snakeweed (Gutierrezia sarothrae), and 50-60% bare ground. On areas within this type where goldeneye is not present, ground cover is 80-90%, grass vigor is fair to good, and residual vegetation in the form of litter is good.

The open Alligator juniper/beargrass/grassland type is characterized by blue grama, hairy grama, side oats grama, muhly spp. (Muhlenbergia spp.), and little bluestem (Andropogon scoparius) as dominants. Other species present include three-awn spp., squirreltail, buffalograss (Buchloe dactyloides), and cottontop (Trichachne californica). Excluding canyons, much of the area is open grassland within an overstory of Alligator juniper, with a canopy cover of 0-20%. Ground cover varies from 70-85% in the southern portion of the Black Mountain Pasture, northern Eagle pasture, and western East pasture. To the east ground cover declines to 40-50%, although diversity of grasses is generally good throughout the type. Interspersed throughout the type are areas of goldeneye, snakeweed and sunflower inclusions.

Alligator juniper woodland

The Alligator juniper woodland association covers approximately 4834 acres or 51% of the land area, the largest association within the project area. This association is diverse with four distinct types within the association.

The Alligator juniper/oak type occurs in the central drainages and on the southwest corner of the allotment. This type represents approximately 527 acres or 6% of the land area. These drainages are all ephemeral, relatively shallow with gentle slopes. The overstory is dominated by Alligator juniper and gray oak. Herbaceous understory is dominated by hairy grama, wolftail, and three-awn grass species. Browse species are present in low composition percentages and include desert ceanothus (Ceanothus greggii) and squawbush. Alligator juniper is mostly mid-age with a moderate canopy cover of 30-50%. The gray oak understory varies from young to mature with low to moderate regeneration. Diversity within the association is lacking. Herbaceous cover is generally 40-60% and is inadequate to prevent soil erosion on terraces. Snag densities are less than one per acre. Dead and down woody material is low at less than one ton/acre.

The open Alligator juniper woodland was also referred to in the grasslands section. It represents 621 acres or just over 6% of the land area. This type consists of young to mid-age alligator juniper with herbaceous cover consisting of grama grasses, three-awn, wolftail, vine-mesquite (Panicum obtusum), and squirreltail.

Understory vegetation is scarce and consists of widely dispersed gray oak, cliffrose (Cowania mexicana), mesquite and beargrass. Overstory canopy cover is generally less than 5%. The northern areas within this association contain more mesquite and less herbaceous cover than the southern areas.

The open Alligator juniper/beargrass type was also referred to in the grassland section. It represents 3319 acres or 35% of the land area, the largest vegetative type within the association. Alligator juniper is the dominant overstory species. Pinyon pine (Pinus edulis) occurs, but is rare. Canopy cover varies from 0-5%, with small pockets up to 20%. Age class of trees within the type are generally monotypic mid-age. Beargrass is the dominant understory species. Browse/shrub species include gray oak and desert ceanothus, but are rare, making the landscape an open savanna type. Dominant grass species consist of grama grasses, bullgrass (Muhlenbergia emersleyi), and plains lovegrass (Eragrostis intermedia), with vine-mesquite, needlegrass (Stipa spp.), and little bluestem also represented. Goldeneye and snakeweed occurs on several ridges. Grass vigor is fair to good, except where goldeneye occurs, and ground cover is 60-80%.

The Alligator juniper/browse type represents 368 acres or 4% of the land area. It occurs west of central Bear Canyon. Dominant overstory consists of young to mid-age alligator juniper with a canopy cover of 5-15%. Understory species are shrubby gray oak and desert ceanothus, making it an important wildlife habitat zone. Utilization of browse species is low. Herbaceous species are dominated by blue grama and side oats grama. Ground cover is generally 60-70% with good grass vigor. The northern section of this type is generally more open and currently has large areas of goldeneye encroachment. Where goldeneye exists, grass cover is lacking.

Pinyon-juniper/oak/beargrass

This vegetation association represents 1744 acres or 18% of the allotment and is separated into two distinct communities.

The first community occurs on the slopes of upper Bear Canyon and the extreme Southeast portion of the allotment. It represents 590 acres or 6% of the land area. This is a diverse community. Dominant overstory vegetation consists of alligator juniper, pinyon pine, and one-seed juniper. Canopy cover is 30-50%, age classes are young to mature with old growth Alligator juniper in small pockets. Snag densities and dead and down woody material components are low. Understory species include gray oak, beargrass, desert ceanothus, yucca species, and squawbush, both scarce and abundant. Regeneration of woody species is low to moderate. Grass species are dominated by grama grasses, bullgrass, and squirreltail. Ground cover is generally 40-50% but exceeds 70% in some areas.

The second community within this association occurs in Bee Canyon. This community represents 1154 acres or 12% of the land area. Mid-age to mature pinyon pine dominates with one-seed juniper (Juniperus monosperma) and alligator juniper co-dominants. Juniper species are mid-age to mature, with old growth Alligator juniper around the CC tank area. Gray oak, beargrass, rabbitbrush (Chrysothamnus spp.), and yucca dominate the understory. Dominant herbaceous species include blue grama, side oats grama, and bullgrass. Other species present include little bluestem, buffalograss, cottontop, and squirreltail. Ground cover varies significantly from 40-80%. Slopes where this community is present are usually gentle and shallow.

One-seed juniper woodland

This vegetation association represents 1188 acres or 13% of the land area and is separated into two distinct communities.

The first community is characterized as a One-seed juniper/gray oak/beargrass community. There are several small pockets of this type existing in the south-central area of the allotment, representing approximately 189 acres or 2% of the land area. Mid-age class one-seed juniper is the dominant overstory species. Alligator juniper is a co-dominant but accounts for small percentage of the overstory. Overstory canopy cover is generally 15-30%. Snag density and dead and down woody material are both low. Gray oak is the dominant understory species with beargrass present. Dominant herbaceous species are side oats grama, wolftail, and three-awn. Squirreltail and six-weeks grama (*Bouteloua barbata*) are also present. Grass vigor is good, ground cover is 80-90%, with good residual vegetation in the form of litter present.

The second community is characterized by a One-seed juniper/mesquite community. There are two transition stages within this type, representing approximately 1000 acres or 10% of the land area. Landscape within this type is a series of narrow drainages and narrow ridgetops occurring in the northwest corner of the allotments. The first transition stage occurs in the eastern portion of this type and is dominated by young to mid-age one-seed juniper with alligator juniper co-dominant with a canopy cover of 20-30%. Snags and dead and down woody material are almost non-existent. Understory canopy is represented almost exclusively by mesquite. Dominant herbaceous species are side oats grama, blue grama, and wolftail. Vine-mesquite and cottontop are also present. Grass vigor is fair, ground cover is 60-70% with little residual vegetation litter present. Erosion and soil capping are evident and cool season grass components are minimal. The second transition stage occurs in the western portion of this type. One-seed juniper density is higher, with an increased canopy cover of 30-50%. The mesquite component is decreased and is replaced by abundant desert ceanothus and cliffrose. Herbaceous cover is similar with squirreltail co-dominant, increasing the cool season component.

Vertic Soils

There are three soil mapping units within the Baseline and Horse Springs Allotments that have vertic intergrades. Vertic intergrades are soils that have not yet degraded to vertisol. Vertic intergrades are separated taxonomically from Vertisols by the degree of cracks to the surface. Larger cracks at the surface that are continuous into the subsoil allow these soils to "churn". When the soils are dry, wide cracks develop. Topsoil or surface soil is moved into cracks from animal disturbance or by wind or water induced surface erosion. The soils swell shut during wet periods forcing subsurface soils to the surface. The majority are soils that have some characteristics of vertisols, such as heavy (clayey) subsurface horizons and obvious cracks in the soil surface, but still have remnants of "topsoil", made up of silty clay or silty clay loam textures. These soils are identified in the field as having few perennial plants, with a slight rolling appearance, and generally have some cobble sized rock fragments on the surface. These soils are highly erosive, and even on relatively flat ground can show some evidence of soil movement and piping, eventually forming gullies.

470 - Vertic Haplustalfs, HSM,3, 0, fine, montmorillonitic component as well as the Aridic Haplustalfs. These soils are found on slopes greater than 15 percent. Increasing effective groundcover and leaving residual plant litter on these soils is a major objective. This soil unit occurs on 333 acres or (3%) of the land area.

479 - Vertic Haplustalfs, HSM 4, -1, fine, montmorillonitic component. This component is classified as having a lack of effective ground cover. These soils need a minimum of 15 percent vegetative cover to prevent further accelerated soil loss. The Typic Haplustalf component has adequate cover. Shallow depth to clay is a limiting factor for any management activity in this unit. Activities that mix the top few inches of soil may be detrimental to the surface soil conditions that allow infiltration of moisture into the soil. Addition of organic material, such as hay or straw broadcast on the surface and incorporated into the surface can improve surface soil conditions. This unit contains approximately 1309 acres (13%) of the land area.

589 - The vertic intergrade component. Activities that mix the top few inches of soil may be detrimental to the surface soil conditions that allow infiltration of moisture into the soil. Gully erosion on this unit is present, and can be treated by straw bale check dams if the gully is small in the upper portion of the watersheds. This unit contains approximately 1103 acres (11%) in the land area.

Watershed and Water Quality

The Baseline and Horse Springs Allotments lie within the two Eagle Creek 5th Code watersheds which encompass 217,860 acres from the Mogollon Rim to Bear Canyon and 188,897 acres from Bear Canyon to the Gila River. Of this acreage the Baseline and Horse Spring Allotments contribute 9,777 acres or 2% of the total Eagle Creek watershed.

Portions of Bee Canyon, Bear Canyon, and Eagle Creek are within the Allotment boundaries, and provide drainage in the Eagle Creek System. A surface water hydrologic connection exists between the Gila River and the Baseline and Horse Springs Allotments via Eagle Creek, Bear Canyon, Bee Canyon, and unnamed washes by the tributary rule. Within the Arizona Department of Environmental Quality waterbody system summary and the Upper Gila River Base Assessment the Baseline and Horse Springs Allotments are primarily within Reach Number AZ15040005-028 designated by 13 miles of Eagle Creek from the headwaters to Willow Creek. The assessment was made to assess each waterbody to determine the level of support for the designated uses and attainment of the Clean Water Act goals for aquatic ecosystems. This waterbody reach was assessed through Arizona Department of Environmental Quality biocriteria site (phys/chem) monitoring. Information on this reach indicates that all uses were fully supported. Designated uses within the report included coldwater aquatic and wildlife, full body contact (swimming), drinking water supply, fish consumption, agriculture irrigation and agriculture livestock watering. The fully supported status for designated uses indicates that number and narrative criteria were not exceeded and any sources of contaminants were adequately managed, so that criteria attainment was predicted.

In order to address resource concerns and obtain objectives under the Allotment Management Plan the following Best Management Practices (BMP's) will be implemented.

1. Preparation of a livestock operating plan to manage for current and projected pasture conditions in order to graze pastures within their capability.
2. Implementation of a more controlled livestock management program to address resource concerns and improve livestock distribution patterns. Livestock management takes into consideration frequency of rest, allowable use, and season of use per pasture.
3. Construction of range improvements such as riparian exclosures, improved water developments, and native grass and forb seeding programs to address resource concerns.
4. Implementation of a monitoring plan to insure consistency of application and the effectiveness of programs.

C. Resource Objectives - The following objectives are prescribed for this Allotment Management Plan to provide site specific details to measure movement from existing to desired land conditions.

Mixed Broadleaf Riparian:

- a. Increase the duration and quantity of ephemeral water flows.
- b. Increase herbaceous understory, providing for bank stabilization and residual herbaceous litter, allowing for flow fluctuations and sediment storage.
- c. Maintain an open overstory of mixed broadleaf riparian trees and shrubs.

- d. Maintain and create a multiple age class of mixed broadleaf riparian species.
- e. Increase down log density.

Grassland:

- a. Move from sodbound grasses to bunch grasses and increase ground cover by both litter and new herbaceous plant establishment to reduce erosion hazard, and improve the water and mineral cycle.
- b. Create a even mixture of both cool season and warm season grass species.
- c. Maintain or create less than 10% canopy cover of Pinyon Juniper on open grassland savannas.
- d. Reduce goldeneye and snakeweed infestations.

Alligator Juniper Woodland:

- a. Improve herbaceous ground cover, especially cool season perennial grass species to improve soil conditions, reduce erosion.
- b. Reduce the expanding Pinyon invasion into this association to maintain an alligator juniper savannah vegetation type.
- c. Maintain and achieve healthy vigorous browse stands within this association.
- d. Maintain and create 15-40% canopy cover of a browse/juniper mix on north facing slopes for wildlife and livestock cover and forage.
- e. Maintain or create 20-30% canopy cover of juniper and browse in drainage and canyon bottoms.
- f. Maintain the old growth component in all associations, particularly the alligator juniper in the southeast corner of the allotment.
- g. Maintain and increase diversity of age classes within this association.
- h. Increase snag densities and the dead and down woody component.
- i. Reduce the snakeweed and goldeneye component especially in the east pasture.

Pinyon/Juniper/Oak/Beargrass:

- a. On slopes less than 15% maintain and create an open grassland savannah with scattered patches of Pinyon/Juniper to provide wildlife cover.
- b. Provide for a natural decrease in mesquite overstory and increased herbaceous production.
- c. Maintain 10% canopy cover on toe slopes and shallow drainages to provide travel corridors for wildlife.
- d. Manage for 10% minimum acreage in old growth in all associations represented, but particularly where Alligator juniper is the dominant species such as in the East pasture.
- e. Obtain diversity of age classes within associations, particularly in the Pinyon/Juniper woodland dominated by Pinyon pine.
- f. Increase snag densities and dead and down woody components.
- g. Increase ground cover of perennial grass species and litter to improve soil conditions and productivity.
- h. Provide for spatially distributed openings that will enhance cover and forage opportunities.
- i. Increase the preferred browse species component such as ceanothus.

One-seed Juniper Woodland:

- a. Increase herbaceous understory, especially cool season perennial grass species to reduce erosion and improve soil conditions.
- b. Reduce snakeweed and goldeneye component, especially in the northwest corner of the North Water Loop pasture.
- c. Increase age class diversity, snag densities and the dead and down woody components.
- d. Increase regeneration of preferred browse species such as ceanothus.
- e. Maintain the majority of browse in immature age classes.

Vertic Soils:

- a. Retention or addition of organic matter to restore heavy textured soils to production.
- b. Restore infiltration capacity to fully utilize precipitation.
- c. Increasing effective ground cover.

III. Livestock Management Operation

A. Livestock Management - This Allotment Management Plan incorporates the use of a combination of increased stock density, increased rest of forage plants, structural and nonstructural range improvements to achieve resource objectives and move from existing to desired land conditions and established goals. The following parameters further define the specific objectives of the livestock management operation.

1. This Allotment Management Plan combines the Baseline and Horse Springs Allotments into one livestock management unit.

2. This livestock management system is a seven pasture deferred rotation livestock operating plan, utilizing both cow/calf and yearling cattle on an eight (8) month seasonal use schedule. Duration of use within each of the three larger pastures is expected to be within the allowable 40 available days. Livestock use duration within each of the four smaller pastures and three working traps is expected to be less than 30 days each. Duration of livestock use per pasture may be adjusted annually, within stocking rates, dependant on monitored residual forage availability, on key areas, the previous season, and effectiveness of the management program.

3. Stocking limits under this livestock management operation are 0 to 100 head of cattle (cow/calf) and 190 to 405 head of cattle (yearling) for 242 days or 8 months between 9/1 and 5/30 annually or 3,019 Animal Unit Months. Annual livestock numbers within this operating program are variable, dependant upon the class of livestock stocked. If no cow/calf pairs are stocked, up to 405 yearlings may be stocked. If 100 cow/calf pairs are stocked, up to 190 yearlings may be stocked.

4. Stocking may take place on 9/1 and be removed on 4/30. Or stocking may take place on 10/1 and be removed by 5/30. Entry and removal dates are dependent upon monitoring, environmental concerns, and/or livestock management considerations.

5. An annual livestock operating plan documenting pasture schedules will be prepared annually with input from the Forest Service and the Term Grazing Permittee based on environmental considerations and livestock management factors which may influence the landscape during the season of livestock use. Special emphasis or treatment areas to targeted during the grazing season to achieve resource objectives will also be identified during the annual planning. Pastures are identified for each environmental, management, and special emphasis factor which then influences livestock movement, timing, and sequencing. Management factors, environmental considerations, and special emphasis areas change as conditions on the ground change. All pastures which are unavailable to livestock grazing over a time frame are identified and removed from the livestock use schedule.

a. Examples of environmental considerations are riparian, erosion concerns, wildlife (elk utilization, pronghorn utilization, calving seasons, hunting seasons, and nesting seasons), threatened, endangered, and sensitive species, soils, and plant vigor.

b. Examples of management factors are poisonous plants, water availability, terrain, calving, breeding, parasite cycles, mineral and protein supplemental feeding, and weather conditions.

c. Examples of treatments which may be utilized on special emphasis areas to achieve resource objectives include severe use of browse species to impede succession, complete rest for browse or herbaceous

advancement such as in riparian areas, animal impact to reduce soil capping, increase grass seeding establishment, and increase ground litter.

6. Maximum growing season rest will be utilized to allow for plant recovery from grazing or disturbance by domestic animals. A minimum of 123 days of growing season rest is planned for all pastures within the allotment.

7. Over grazing of vegetation by grazing animals will be minimized by changing the grazing season to a predominantly dormant season use by domestic livestock. This change allows all plants in all areas of the allotments to recover from livestock grazing activity prior to regrazing during fall, winter and spring months.

8. Increased stock density within the allotment area, reflective of an increase in stocking rates and shortened duration of livestock use, will be used as animal impact to break soil capping, increase water infiltration into hard soils, and increase the amount of organic material or litter incorporated into the soil. Animal impact is defined as the sum total of the direct physical influences a group of animals can have on the land. Animal impact can be used as an effective tool to return old and ungrazed plant material to the soil as litter and promote succession toward perennial grassland associations, provide a seedbed for new seedling establishment, reduce the amount of bare ground, and improve watershed conditions. Animal impact is also a cost effective tool which can be utilized to soften cut banks of gullies, start plant regeneration in eroded areas, and to reduce infestations of noxious weed by creating soil conditions that favor fibrous-rooted grasses over taprooted forbs. The second method of achieving animal impact which may be used to achieve resource objectives is to create livestock excitement through salting and supplements.

B. Distribution Aids - Tools to assist in reaching the desired goals in livestock distribution and how they will be applied on the range are as follows:

1. Water: Construction of an expanded water distribution pipeline system to be used in addition to, and in conjunction with the existing Bear Canyon water system. This water system includes use of a water well, addition of water storage, and additional pipeline distribution. This water system will provide water storage capacity for a minimum of five days at 15 gallons per livestock head per day demand.

2. Salt and Supplements: Salting and the feeding of livestock supplements will be used to aid in management of livestock, achieve resource objectives, and improve livestock condition and weight gains. Salt and supplements will be placed in lightly used areas until the desired level of forage use is achieved. Blocks will not be placed within 1/4 mile of water and ideally no closer than 1/2 mile. Blocks will not be placed in areas which are natural concentration points. Salt and supplements may also be used to increase livestock concentration in areas designated for treatment with increased animal impact.

3. Horseback distribution: Movement of livestock into areas for selected concentrated use or areas of light use will be achieved through herding practices.

4. Fences: Water lot fences will be constructed, **only as needed**, around Deer tank, Black tank, Bear tank, Grass tank, CC tank, Forks tank, Coyote tank, Baseline tank, Dusty tank, Hicks tank, Horse Springs tank, Lion tank, and Line tank. These fences will be constructed only as necessary, to aid in livestock management, to achieve resource objects and provide for areas without livestock disturbance, wildlife protection and wetland habitat enhancement. These fences will be constructed to Forest Service standards and specifications to allow for wildlife access. All other allotment interior and exterior fences will be maintained to Forest Service standards and specifications to control the movement of livestock.

C. Allowable Utilization - Allowable forage use is the degree of utilization of forage plant species considered desirable and attainable over various portions of the allotment, considering influencing factors. Influencing factors include, but are not limited to, the present resource conditions, management objectives, management

level, soil characteristics, and grazing conflicts. Allowable use percentages for this livestock management operation are considered appropriate based on:

1. Dormant or cool season grazing operation.
1. Growing or warm season rest and recovery annually to offset use.
2. Anticipated change in livestock use patterns encouraging livestock to leave the colder bottom areas and use the warmer slopes due to a change in season of use.
3. Anticipated change in forage preference and differing response to terrain features due to change in livestock class from cow/calf to yearling. Yearlings do not have established use patterns and generally do not remain in one area for extended periods of time like adult cows often do.

Utilization is the amount of forage removed by grazing. Residual vegetation is the standing and down plant material remaining within an area following grazing. Allowable utilization standards are based on the standards and guidelines in the Apache-Sitgreaves National Forest Land Management Plan, as amended. These utilization standards reflect the residual vegetation desired to remain on the land following domestic livestock grazing. Residual vegetation is needed to provide for wildlife, ground cover, litter cover, decomposition for soil productivity, and forage reserves. Key areas related to livestock grazing are areas of special emphasis or concern such as riparian areas or threatened, endangered, or sensitive species habitat. Key areas may also be areas where livestock tend to concentrate under a particular livestock management program.

Each pasture will be assessed for quality of forage in relation to other pastures. The forage quality for each pasture will be measured in the number of animal days per acre the pasture will support. This figure is not the number of animals or days the pasture will be utilized, it is a comparison figure to rate pasture quality. The relative quality of each pasture is correlated with the pasture size, forage type, and desired residual vegetation to equate the duration of use for each pasture. Animal days per acre is used to express the volume of forage available from a pasture in a specified time frame and is a reflection of range condition across the landscape. Estimated animal days per acre calculated to be available on the Baseline and Horse Springs Allotments ranges from 10 ADA's on areas of very poor range condition to 80 ADA's on areas of good range condition.

Allowable Use (Dormant Season)

Range Condition Site	Dormant Season Use 9/1 to 5/30
Very Poor	15%
Poor	20%
Fair	40%
Good	45%
Excellent	45%

D. Maintenance of Range Improvements - A list of range improvements assigned to the permit holder is provided within the Term Grazing Permit, Part 3. All assigned range improvements will be maintained by the permittee. Livestock will not be placed on the allotment or moved into pastures if permit requirements concerning range improvement maintenance are not met. Proper maintenance of range improvements will insure that the condition of the improvement is adequate to hold livestock in a pasture and will extend the useful life of the improvement. Routine maintenance of existing range improvements is prioritized above construction of new improvements. No new improvement construction will be scheduled or approved if routine maintenance of existing improvements is not met. Range improvements not needed for the livestock management program will be removed from Forest land and the land returned to its original state.

1. Fences:

a. All allotment boundary fences are to be maintained to standards prior to livestock entering National Forest Lands. Each permittee is responsible for maintenance of a portion of his/her allotment boundary fence. A permittee will not place livestock on the allotment if the neighboring permittee does not maintain their assigned allotment boundary fence.

b. Pasture fences will be maintained prior to moving livestock.

c. Old wire and steel fence posts will be removed from the forest. Old wooden posts will be pulled from the ground and utilized at permittee discretion.

d. Broken wire will be spliced with good quality double strand, 12 gauge barbed or smooth wire.

e. Wire will not be over tightened and will be stretched to remove slack.

f. Broken posts or rotten posts will be replaced with a steel post or a juniper or treated wood post greater than 5" in diameter at the small end of the post.

g. Brace posts will be maintained in tight and serviceable condition.

h. Steel posts which have settled may need to be jacked up and possibly moved. Leaning steel posts will be straightened.

i. Gates will be maintained so they can be opened and closed easily. Gate post ends will be 2-3" in diameter. Use smooth wire for gate loops. Gates will have alternating wire and wooden stays spaced 12" apart.

j. At least 90% of fence stays will be sound. Replacement stays will be of good quality wood 1-1/2" by 3" diameter. The bottom of each stay will rest on the ground and will not extend more than 4" above the top wire fence strand. Galvanized stay wire will be used for tying stays. All fence wires must be attached to the stays.

k. Missing staples and fence clips will be replaced.

l. All trees which have fallen across the fence line will be cut and removed for the fence right-of-way.

2. Water/Springs:

a. Fences to protect springs will be maintained to standards.

b. Collection boxes and inlet pipes will be clean of sediment and debris.

c. Unserviceable pipe will be repaired or replaced. Material not usable will be removed from the Forest.

d. Troughs that leak will be repaired or replaced. Overflow pipes will be placed to avoid crating boggy areas at trough locations.

e. Float valves will be cleaned and set to prevent overflow.

3. Water/Wells and Pipelines:

a. Water storage tanks, troughs, and pipelines will be inspected for water leaks and will be clean of sediment and debris annually, or prior to use.

b. Unserviceable pipe, troughs, and storage tanks will be repaired or replaced. Material not usable will be removed from the Forest.

c. Overflow pipes will be placed at all water storage locations and overflow will be drained away from the water source location to avoid creating boggy areas at trough locations.

d. All pump systems and float valves will be inspected and maintained periodically during system use.

e. All pipelines not in use will be drained prior to winter freeze, unless otherwise specified for wildlife water needs.

f. All troughs directly adjacent to storage tanks will be left operational when the system is not in use for livestock. These water points will provide yearlong water for wildlife populations.

4. Water/Stock Tanks:

a. Fences around stock tanks to aid in livestock distribution patterns will be maintained to standards.

b. Check stock tanks for seepage and spillway blockage.

c. Tanks will be cleaned to their original capacity. Special care will be taken during cleaning to prevent future water loss. Eroded portions will be repaired. All heavy equipment work on tanks will be coordinated with the District Ranger.

E. Range Improvement Construction - A permit modification will be prepared for approved reconstruction or new project construction each year. All new range improvement construction will be completed to Forest Service standards and specifications which will be provided as part of the permit modification. The permittee will sign a permit modification form for the project and will sign for materials furnished by the forest. Range improvements not specifically listed in the improvement program schedule and all ground disturbing activities will not be initiated by the permittee until proper clearances have been approved. The needed structural range improvements on the allotment are prioritized by management objective.

1. Construct water lot fences for wildlife protection and wetland habitat enhancement. All water lot fencing will enclose the entire impoundment area and will be constructed to standards and guidelines as described in the Forest Service Structural Range Improvement Handbook. Spacing between fence posts will be 20 feet with three strands of barbed wire, one strand of barbless wire, three stays between posts, the bottom wire placed at least 16" above ground level, and elk crossings provided at corner posts. These fence construction standards provide for elk, pronghorn and deer access.

a. 1999 Grazing Season:

Construct water lot fences around Deer tank and Line tank.

2. Construction and installation of the Bear Canyon water system expansion project. This water system will be constructed to Forest Service standards and specifications and will be completed under a multiple partnership program between the Forest Service, Term Grazing Permittee, Arizona Water Protection Fund, and Arizona Game and Fish.

b. 1998 Grazing Season:

Drill a water well near Black Mountain.

Begin purchasing water storage tanks, troughs, and pipeline materials.

c. 1999 Grazing Season:

Purchase and installation of solar submersible pumps and solar booster pumps at the well location.

Construction and installation of a 30,000 gallon water storage system at the 5,860 foot elevation.

Purchase and installation of three 8,000 gallon fiberglass storage tanks to be used throughout the system for additional storage and water pressure reduction.

d. 2000 Grazing Season:

Purchase and installation of 47,000 linear feet of 2" 260 psi polyethylene pipeline.

Purchase and installation of thirteen 500 gallon water troughs with float valves.

F. Nonstructural Range Improvements - Nonstructural improvements such as reseeding and plant control are programmed to be completed as opportunity allows. These programs will not be prioritized until the livestock management system is in place and operations are successful.

1. Construction and use of gabion baskets, straw bales check dams, slash piling, and/or reseeding to reduce erosion and catch sediment within active gullies, usually occurring sporadically along old road beds. These structures will be constructed of wire mesh baskets or hay bales placed across the gully channels. The wire basket structures will be filled with rocks and secured to the site. Hay bales will also be secured to the site. Fill catchment will be reseeded with native grasses. Areas where treatment may be utilized (especially along old road beds) include specific sites within grazing areas #1, 2, 5, 19, 27, 28, 29 and 30. Seed application to be done by hand broadcasting.

2. Seeding of native grasses and legumes on vertic soil areas and areas of watershed concern. The seeding program will provide protective cover, reduce erosion during periods of high run off, improve forage value for livestock and wildlife, and reduce invasion of undesirable annual and perennial forbs and shrubs. Areas where reseeding may be applied, **only as needed**, include grazing areas #1, 2, 5, 12, 16, 18, 19, 20, 25, 26, 27, 28, 29, and 30. Seed application will be done by hand broadcasting.

3. The use of hay or mulch on reseeded or disturbed areas to provide protective cover for seed, reduce erosion during high water runoff, and increase ground litter.

IV. Monitoring

The following monitoring measures have been selected to evaluate changes over time in overall landscape conditions on the Baseline and Horse Springs Allotments as they relate to resource objectives and established goals. The execution of these monitoring measures should result in data for two levels monitoring. The two levels are implementation monitoring and effectiveness monitoring. Implementation monitoring indicates whether management activities have been accomplished as prescribed. Effectiveness monitoring determines if management activities as executed are moving the landscape toward resource objectives and goals.

1. To improve future management a record will be maintained of changes in the planned annual livestock operation, general information and observations, and continued data collection on monitoring points established across the allotment area, in all vegetation associations. A record will also be maintained by the permittee of social and economic effects of the Allotment Management Plan in relation to meeting established goals. A record of the following general information will also be maintained:

- a. Duration of use per pasture. Areas within the pasture to receive prescribed animal impact during grazing use.
- b. Overall condition and available animal/days/acre of each pasture when the livestock are removed.
- c. Actual livestock utilization of available forage and changes in production of available forage on soil types classified as having "allowable capacity for livestock grazing".
- d. Rainfall for the ranch area.
- e. Livestock production achievements in the form of production per acre.
- f. Any observations on wildlife, livestock use patterns, soil movement, insect activity, or changes in the land area.

2. Monitoring points have been established across the project area, in all vegetation associations. Monitoring Points include:

A. Fixed point photographs. The photo points are positioned at transect markers with a recognizable permanent landscape feature as the focal point to provide an overall view of the area. This photo gives a good view of ground cover and overall vegetation associations. Photos are also taken at transect starting points to give a good view of the ground surface. Photo points are taken at periodic intervals during the same season, if possible.

1. At Frequency, paced transect, and Parker 3 step clusters
2. a. South water loop Y.
 - North - sign post and cone #1
 - N.E. - sign post and Rose Peak
 - E. - sign post and Black Mountain
 - W - along fence line
 - E - along fence line
- b. South Water Loop cone #2
 - NW - cone and juniper
 - NE - cone and Rose Peak
 - S - cone and Table Top
- c. Bear Canyon / SE Corner of Cow Trap
 - E - corner post and juniper
 - SE - corner post and Grey's Peak
 - SW - corner post and Table Top
 - NE - corner post and rock pile
- d. Hold Up Flat
 - NE - four corners and Ridge Peak
 - S - second Rock pile
 - SW - third rock pile
 - S - mesquite and Table Top
 - NE - rock pile and Rose Peak
 - SE - mesquite and Greys Peak
- e. Hicks Cemetery
 - Contrast inside/outside
 - Vertic
 - Plant frequency, ground cover and health
- f. Large arroyo filled in by Phelps Dodge pipeline dirt in 1988
- g. North Black Mountain
 - Rock Pile to N, S, E, and W
- h. Middle pasture
 - 515 detour
 - Snakeweed patch on North Ridge
 - South ridge
 - Steep slope
 - No slope
- i. Clay Canyon
 - several rock monuments at key sites
- j. East Pasture
 - fenced enclosure

B. Parker Three Step: The Parker Three Step method is designated to provide a permanent record of long term resource trend. Installation of permanently staked transects within selected key study areas were established on the Baseline and Horse Springs Allotments in 1955. Data interpretation from these transects provides information on vegetation condition, soil condition, soil stability, estimation of apparent trend over time, plant vigor, ground cover, canopy cover, species composition, and changes in cool season components. These clusters serve as a benchmark for these allotments and will be repeated at periodic intervals of ten years, as established in the Apache-Sitgreaves National Forest Land Management Plan.

Parker Three Step Clusters:

- North Water Loop Roadside
- Bear Canyon Ridge Post
- Bear Canyon Roadside

C. Paced Transects: Pace transects are the primary annual methodology for effectiveness monitoring to determine resource responses to management as applied. Paced transects assist in estimating vegetation condition, trend, soil condition, plant vigor, cover, and composition. Where shrubby species make up a middle story, additional information will be taken to evaluate browse composition, density, availability, and vigor. Within riparian areas information will be taken on midstory and overstory vegetation.

Paced Transects (historic site locations)

- North Water Loop East Side Mud Springs Canyon
- Bear Canyon 7+A/North Water Loop Fence
- Bear Canyon Road

Paced Transects (objective monitoring locations)

- Mixed Broadleaf Riparian
- Grassland
- Alligator Juniper Woodland
- Pinyon-Juniper/Oak Beargrass
- One-seed Juniper Woodland
- Vertic Soils

D. Ocular Estimates: Following proper training through the use of more in-depth transect methods ocular estimates will be used to indicate general changes in vegetation condition, soil condition, and trend.

Ocular Estimates will be used:

- Annual water flow in Bear Canyon will be monitored for beginning and ending flow dates, as well as any other observed variances.

- Wildlife observations of both game and non-game species occurring on the Allotments.

- Observations on insect activity and other biological processes.

- Other observations in landscape changes such as canopy cover, plant vigor, species composition changes, soil movement, etc.

E. Frequency plots: Frequency plots established on the Baseline and Horse Springs Allotments to indicate changes in vegetation composition and long term trend will be repeated at periodic intervals of three to five years:

Frequency Plots:

- BL1 BC Pasture 7+A fence
- BL2 1/2 mile north S/E windmill
- BL3 Four corners

- BL4 Second wire cone South Water Loop
- BL5 Mesquite flat North Water Loop
- BL6 Sunflower Corral
- BL7 Sunflower Mesa
- BL8 1/2 mile southwest Gibson Tank
- BL9 1/2 mile east CC Tank

F. Water Resources Analysis: Water Resources Analysis will be repeated at periodic intervals of one to three years.

Thalweg-Watershed Area Link water quality monitoring of Eagle Creek to provide diversity, productivity, and stability comparisons to long term natural stream health and watershed health conditions.

Cross section transects of Eagle Creek to provide stream structure, composition, and stability comparisons to long term stream health conditions. Stream Transects and Cross Sections:

- Eagle Creek below Bear Canyon confluence.
- Eagle Creek above Robinson Canyon confluence.
- Eagle Creek below Honeymoon campground.
- Eagle Creek FS Admin Horse Pasture (Cross Section only)

V. Exhibits

1. Baseline / Horse Springs Allotment Management Plan Improvements and Pastures
2. Baseline / Horse Springs Allotment Grazing Areas
3. Baseline / Horse Springs Allotment Existing Vegetation Associations and Transect Locations
4. Baseline / Horse Springs Allotment Soils and Range Condition Map for Production/Utilization Surveys
5. Baseline / Horse Springs Allotment Range Improvement Tasks and Cost Distribution Chart