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Wild Horses and Burros Management Handbook



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ACRONYMS

- AML – Appropriate Management Level
- APHIS – Animal Plant Health Inspection Service (Department of Agriculture)
- AUM – Animal Unit Month
- AU – Animal Unit
- BLM – Bureau of Land Management (Department of Interior)
- CFR – Code of Federal Regulations
- DNA – Determination of NEPA Adequacy
- DR – Decision Record
- EA – Environmental Assessment
- EIS – Environmental Impact Statement
- ESI – Ecological Site Inventory
- FLPMA – Federal Land Policy and Management Act of 1976
- FONSI – Finding of No Significant Impact
- HA – Herd Area
- HMA – Herd Management Area
- HMAP – Herd Management Area Plan
- IBLA – Interior Board of Land Appeals
- IUD – Intrauterine Device
- LUP – Land Use Plan
- MFP – Management Framework Plan
- MLRA – Major Land Resource Area (NRCS Ecological Site Descriptions)
- MUD – Multiple Use Decision
- NEPA – National Environmental Policy Act of 1969
- NPO – National Program Office (Reno, Nevada)
- NRCS – Natural Resources Conservation Service
- PZP – Porcine Zona Pellucida
- RMP – Resource Management Plan
- ROD – Record of Decision
- SOPs – Standard Operating Procedures
- TES – Threatened, Endangered or Sensitive Species
- TNEB – Thriving Natural Ecological Balance
- WFRHBA – Wild Free-Roaming Horses and Burros Act of 1971 (as amended)
- WH&B – Wild Free-Roaming Horses and Burros
- WHT – U.S. Forest Service Wild Horse Territory
- WO – Washington Office (Headquarters)
- WSA – Wilderness Study Area
- USC – United States Code
- USFS – United States Forest Service (Department of Agriculture)
- USGS – United States Geological Service (Department of Interior)

CHAPTER 1—INTRODUCTION

GENERAL

The Bureau of Land Management (BLM) is responsible for the protection, management and control of wild free-roaming horses and burros (WH&B). Under the Wild Free-Roaming Horses and Burros Act (WFRHBA), WH&B are considered an integral part of the national system of public lands in the areas where they were found in 1971. The BLM's goal is to manage healthy WH&B populations on healthy rangelands. To achieve this goal, the BLM designates Herd Management Areas (HMAs) for the long-term maintenance of WH&B herds and collects data about the animals and their habitat. The BLM also prescribes management to assure WH&B populations are in balance with other uses of the public lands and that a thriving natural ecological balance (TNEB) is achieved and maintained. Activities are carried out with the objective of maintaining free-roaming behavior and at the minimum feasible level of management necessary to attain the objectives identified in approved land use plans (LUPs) and Herd Management Area Plans (HMAPs).

1.1 PURPOSE

This handbook describes the authorities, objectives, policies and procedures that guide the management of WH&B on the public lands administered by the BLM.

1.2 OBJECTIVE

The objective of this handbook is to provide guidance for the protection, management and control of WH&B in accordance with the 1971 WFRHBA, as amended, and the implementing regulations in 43 Code of Federal Regulations (CFR) 4700.

CHAPTER 2—LAND USE PLANNING

GENERAL

Section 202(a) of the 1976 Federal Land Policy and Management Act (FLPMA) requires the Secretary to develop, maintain, and when appropriate revise LUPs that provide (by tracts or areas) for the use of the public lands. The responsible BLM official shall follow the established LUP procedures in 43 CFR 1600, associated BLM manual sections and policy for fulfilling the planning requirements prescribed in the statute.

LUPs are the basis for every on-the-ground management decision that the BLM makes. LUPs establish goals and objectives (desired outcomes), identify the management actions needed to achieve the desired outcomes, and identify allowable uses of the public lands.

2.1 LAND USE PLAN DECISIONS

LUP planning requirements for the WH&B program are applicable to all BLM LUP documents, including Management Framework Plans (MFPs) and Resource Management Plans (RMPs).

2.1.1 Comparability Consideration

Under 43 CFR 4700.0-6(b), WH&B shall be considered comparably with other resource values in the formulation of LUPs. This means WH&B are to be considered in the same manner as other resource values (e.g., cultural, historic, scenic, rangelands, timber, and minerals). WH&B are a resource value, as opposed to a land use (e.g., livestock grazing or timber harvest).

2.1.2 Herd Areas

Herd areas (HAs) are limited to areas of the public lands identified as habitat used by WH&B at the time that the WFRHBA passed (December 15, 1971). When preparing a LUP, identify the HAs (in whole or in part) which will not be managed as HMAs and explain the reasons they will not be managed for WH&B.

HA boundaries can be adjusted through a LUP when the current boundary does not correctly portray where WH&B were found in 1971 based on well-documented historical data. Existing herd areas where all animals were privately-owned (claimed during the claiming period) shall be dropped from HA status in a LUP.

Under 43 CFR 4710.2 and to assure transparency regarding the disposition of HAs, the authorized officer shall permanently maintain a record regarding the location of all HA boundaries and explanations of any changes in field office (FO) files.

2.1.3 Herd Management Areas

HMAs shall be designated in those HAs within which WH&B can be maintained over the long term in LUPs. For each HMA designated within the planning area, the LUP should identify the following:

- The HA(s) that contain the HMA.
- The initial and estimated herd size that could be managed while still preserving and maintaining a TNEB and multiple-use relationships for that area.
- The guidelines and criteria for adjusting herd size.

LUPs should also identify:

- The HMAs to be managed for non-reproducing wild horses to aid in controlling on the range population numbers and the criteria for their selection (16 United States Code (USC) § 1333(b)(1)). See Chapter 4 (Population Management). Examples of criteria that could be used to select HMAs for management of non-reproducing wild horses include: no special or unique herd characteristics, low ecologic condition, limited public land water, and reliance on private water.
- The management tools to control population size within AML and to extend (reduce) gather frequency.

2.1.4 Herd Areas Not Designated as HMAs

Where appropriate, the LUP may include decisions not to manage WH&B in all or a part of an HA. An example is intermingled and unfenced private lands within HAs where the landowners are unwilling to make them available for WH&B use, or the animals present at that time were later found to be claimed domestic horses (or burros). Another example would be where essential habitat components (forage, water, cover and space) are unavailable or insufficient to sustain healthy WH&B and healthy rangelands over the long term.

2.1.5 Changes to HA or HMA Boundaries

Decisions to change HA boundaries, to designate HMAs for the maintenance of WH&B, or to remove all or a portion of an area's designation as an HMA must be made through a LUP amendment, revision or new RMP (43 CFR 4710.1 and H-1601-1: Land Use Planning Handbook).

HMA boundaries may be changed within HAs through the LUP process to facilitate WH&B management or mitigate unacceptable impacts to other resources.

An area may lose its designation as an HMA when WH&B cause unacceptable impacts to other resource values, or conditions change and one or more of the four essential habitat components are not present in sufficient quantities to sustain WH&B use over the long term. Similarly, if conditions change, all or part of an HA may be reconsidered for designation as an HMA through LUP. See Chapter 3 (Habitat Management).

2.1.6 Wild Horse and/or Burro Ranges

An HMA may be considered for designation as a WH&B Range to be managed principally, but not necessarily exclusively, for WH&B. Criteria for consideration as a WH&B Range should include the presence of one or more of the following: unique herd characteristics, outstanding viewing opportunities, unique landscape, or significant historical or cultural features (H-1601-1: Appendix D). The authorized officer, currently only the Director or Assistant Director (AD) (refer to BLM Manual 1203: Delegation of Authority), may establish a WH&B Range after a full assessment of the impact on other resources through the LUP process.

2.2 *GRAZING AUTHORIZATIONS WITHIN HMAs*

Domestic horses and burros may not graze under permits or leases within HMA boundaries (43 CFR 4710.5(b)). If necessary to provide habitat for WH&B, to implement herd management actions, or to protect WH&B from disease, harassment or injury, the authorized officer may close areas of the public lands to grazing use by all or a particular kind of livestock (43 CFR 4710.5(a)).

Closure to livestock grazing may be temporary or permanent (43 CFR 4710.5(c)). Prior to issuing a final decision to permanently close an area to livestock grazing use, a LUP amendment should be completed. Completion of site-specific environmental analysis and issuance of a proposed and final decision pursuant to 43 CFR 4160 (2005) is also required.

2.3 *OTHER PERMITTED ACTIVITIES*

2.3.1 Commercial Recreation Use

Proposals for commercial recreational use of the public lands should be evaluated through the appropriate BLM permitting process. Permits should stipulate the safeguards necessary to protect the health and welfare of WH&B, particularly before, during and immediately following the peak foaling period (e.g., generally March – June). See Chapter 4 (4.4.4).

Proposals for motor vehicle racing, air racing, or other potentially intrusive activities have potential to harass or harm WH&B. Permit authorizations should contain provisions to minimize impacts to WH&B from these activities. Should adequate safeguards prove impractical, permits should not be approved (refer to BLM Manual Section 2930 and H-2930-1: Recreation Permit Administration).

2.3.2 Energy and Minerals Exploration and Development

The health and welfare of WH&B should be considered during project planning for hard-rock mining or oil and gas exploration and development; non-mineral sales such as gravel; or wind or solar energy development proposals. Specific mitigation measures will be identified through a site-specific environmental analysis and decision process in accordance with the 1969 National Environmental Policy Act (NEPA). Mitigation measures will be implemented through applicable permits.

2.4 LAND USE PLAN GOALS AND OBJECTIVES

LUPs normally contain general habitat and population management goals and objectives. LUPs may also include the management requirements or actions necessary to make progress toward attainment of Land Health Standards and to preserve and maintain a TNEB and multiple-use relationship on the public lands.

2.4.1 Habitat and Population Management

Habitat or population management and monitoring objectives regarding the management of a specific HMA or complex of HMAs are normally identified in a Herd Management Area Plan (HMAP) rather than a LUP.

2.5 IMPLEMENTATION DECISIONS

Implementation decisions make progress toward achieving LUP goals and objectives and may include:

- Establishing or adjusting appropriate management levels (AMLs) based on monitoring and evaluation, including the population range within which the herd size will be allowed to fluctuate.
- Identifying and setting objectives for herd composition, animal characteristics and habitat development needs (e.g., HMAPs).
- Specific habitat improvement projects (e.g., construction, modification, or removal of fences; water development construction/reconstruction or removal; or re-vegetation projects).
- Site-specific population management actions (e.g., decisions to gather/remove excess WH&B, apply fertility control, or adjust age or sex ratios).

2.5.1 Appropriate Management Level (AML) Adjustments

AML may be adjusted (either up or down) through a site-specific environmental analysis and decision process (NEPA). An analysis under NEPA is also required to establish a population range (upper and lower limit) for AMLs initially established as a single number. Development of a LUP amendment or revision is not generally required.

2.5.1.1 AMLs Established in LUPs

- When AML is established in a LUP, follow the process outlined in the LUP to adjust AML.
- When the LUP does not outline a process for AML adjustment, the LUP may need to be amended or revised to adjust AML.

2.5.1.2 AMLs Established through Implementation Decisions

See Chapter 4 (4.2.2).

2.5.2 Herd Management Area Plans

Herd Management Area Plans (HMAPs) are prepared under 43 CFR 4710.3-1. HMAPs establish short- and long-term management and monitoring objectives for a specific WH&B herd and its habitat. HMAPs also identify the actions to be taken to accomplish herd and habitat management objectives. An HMAP assists the authorized officer in tracking progress toward achieving LUP goals.

HMAPs tier to and must be in conformance with the applicable LUP. If the proposed management strategy is not consistent with the LUP, then the LUP should be amended, or the proposal should be modified or rejected.

HMAPs may be prepared for a single HMA or a complex of adjacent HMAs where animal interchange occurs. When two or more jurisdictions have management responsibility for portions of a single HMA or an HMA complex, BLM will designate one field office with the lead responsibility for development of the HMAP and management of the HMA or complex. When a WH&B herd is dependent on the habitat within a BLM HMA and an adjacent U.S. Forest Service (USFS) Wild Horse Territory (WHT), the agencies should jointly determine lead responsibility for development of the HMAP and management of the herd and habitat.

2.6 NOTICES, CONSULTATIONS AND HEARINGS

2.6.1 Agency Consultation and Public Involvement

See BLM Manual Section 4710.25.

2.6.2 Hearings

See BLM Manual Section 4740.3.

CHAPTER 3—HABITAT MANAGEMENT

GENERAL

Habitat for WH&B is composed of four essential components: forage, water, cover, and space. These components must be present within the HMA in sufficient amounts to sustain healthy WH&B populations and healthy rangelands over the long term. If they are not present in sufficient amounts, the authorized officer should consider amending or revising the LUP to remove the area's designation as an HMA. If the decision is made to return a designated HMA to HA status, the total population of WH&B should then be gathered and removed. See BLM Manual Section 4710.3.

A recurring pattern of WH&B movement out of the HMA to access forage, water, or thermal or hiding cover is an indication that year-long WH&B use cannot be sustained. If one or more of the key habitat components is missing, the HMA should be considered as unsuitable for year-long use. In these situations, the authorized officer should consider removing the area's designation as an HMA through LUP. An exception would be two or more HMAs which adjoin and are managed as a complex of HMAs, or HMAs which adjoin USFS WHTs that can be managed as a complex.

3.1 FORAGE (VEGETATION)

Forage (vegetation) is one of the essential components of WH&B habitat. The authorized officer should determine whether vegetation provides sustainable forage (and cover) for the animals. Vegetation should be managed within each HMA in a manner that achieves and maintains a TNEB and assures significant progress is made toward achieving the Standards for Land Health and other site-specific or landscape-level objectives.

3.2 WATER

An adequate year-round quantity and quality of water must be present in the HMA to sustain WH&B numbers within AML. If baseline information concerning access to and availability of water does not exist, then a public land water inventory should be conducted.

If privately-owned water is essential to sustaining WH&B populations within HMAs, cooperative agreements with the owners or acquisition of water rights should be considered. If agreement cannot be achieved with private water owners, or if public land water cannot be developed and maintained, one of the following should occur:

- AML should be adjusted based on the available public land water within the HMA boundary.
- The authorized officer should amend or revise the LUP to remove the area's designation as an HMA.

3.3 COVER (VEGETATION) AND SPACE

The terrain and vegetation are needed to provide WH&B with escape (hiding) cover and shelter from the prevailing weather. (Vegetation also provides sustainable forage. See 3.1 above). WH&B require sufficient space to allow the herd to move freely between water and forage within seasonal habitats. Cover and space are interrelated. If the HMA has barriers preventing free movement of WH&B throughout the HMA or between forage and water, it would not have sufficient cover and space. Barriers can be natural (e.g., rock rims, rivers) or human-induced (e.g., fences, highways).

3.4 HABITAT IMPROVEMENT PROJECTS

3.4.1 Nonstructural Improvements

Nonstructural improvement projects such as seeding, prescribed fire, emergency fire rehabilitation or shrub and tree removal have potential to increase the forage available for WH&B use and to improve habitat conditions. They may also cause grazing animals to concentrate their use within the project area. As a result, it may be necessary to close these areas to grazing until vegetation management objectives are achieved.

Before making the decision to exclude an area from grazing use, the authorized officer should first take a hard look at alternatives to fencing. These alternatives could include:

- Reduce WH&B populations to the AML lower limit.
- Reduce WH&B to a number below the AML lower limit (based on the available forage and water).
- One of the above, in combination with closing the area to domestic livestock use (in whole or in part).
- Use of mineral supplements to modify distribution.
- Restrict or eliminate access to selected water sources.

If the authorized officer determines fence construction is necessary, the fences should be designed to maintain WH&B access to critical water sources. Fences should then be removed once objectives have been achieved.

3.4.2 Structural Improvements

Construct and maintain structural improvement projects (e.g., fences, cattle guards, or water developments) in a manner that protects the wild, free-roaming nature of WH&B and provides for normal herd distribution and movement as well as genetic interchange.

While some projects might increase the forage, cover, or water available for WH&B, others might negatively impact individual animals or entire populations:

- Fences and cattle guards might restrict seasonal WH&B movement or use of critical escape (hiding) or thermal cover, key spring-summer-fall-winter use areas, or critical water sources.

- Water development projects might encourage use outside the HMA or concentrate use in sensitive areas.

Existing projects that negatively impact WH&B should be considered for removal or modification through coordinated activity plans. Proposed projects should be analyzed and mitigation proposed to minimize adverse impacts to WH&B where possible.

3.4.2.1 Existing Fences and Cattle Guards

Existing fences and cattle guards with negative impacts to WH&B should be reviewed to determine:

- If the project is still needed; or
- Whether the project can be modified to minimize impacts to WH&B.

Possible fence or cattle guard modifications could include:

- Make fences open-ended allowing WH&B movement around the ends.
- Construct large gates or sections of “let-down” fence, or consider the use of electric take-down fence where feasible, to allow movement when fences are not needed for livestock control.
- Weld rebar strips between cattle guard grates; or
- Replace the cattle guard with a gate, if possible.

3.4.2.2 Proposed Fences and Cattle Guards

Fencing within an HMA should be done only after the impacts are carefully analyzed through the NEPA process. If fences and cattle guards are essential for proper resource management, they should be constructed with particular attention to location and design. Avoid locating fences across migration routes, to prevent WH&B (or livestock) concentration, or the unintended trapping or death of WH&B.

3.4.1.3 Existing Water Developments

Consistent with resource management objectives, existing projects may be modified to provide WH&B with access to water through one or more of the following methods:

- Piping water to a trough away from the source.
- Piping water to a trough outside an enclosure.
- Retaining a portion of the source outside the enclosure.

3.4.1.4 Proposed Water Developments

Water sources may be excluded from use by WH&B to protect the water source, the associated riparian area, and to maintain or improve the quality and quantity of water. Where possible, projects should be designed to provide WH&B with access to water as described in 3.4.1.3 above.

Fences constructed in proximity to major WH&B water sources and smaller riparian pastures or enclosures should be constructed with a top rail composed of pipe or wooden poles. The top rails provide a visual barrier to prevent WH&B from entering the enclosure and becoming trapped. Project design may also consider the use of specialized gates (e.g., finger gates) to allow any WH&B entering an enclosure to exit safely.

Reservoirs and similar water sources should be designed and maintained with gently sloping (rather than steep) sides to avoid trapping foals.

Where WH&B are, or may become, dependent upon mechanically provided water, the authorized officer shall assure that alternative sources of known and accessible water are available to WH&B in the event of a system failure of a well, storage tank, pipeline, trough, or float device.

Actions to assure water is available to WH&B may include:

- Entering into Cooperative Range Improvement Agreements (Form 4120-6) whose terms and conditions require water to be made available to WH&B and wildlife.
- Using WH&B program funding (in whole or part) for construction and/or maintenance of a well, spring development, catchment, pond, or other permanent water improvement providing WH&B with access to water on public land.
- Acquiring the necessary water rights in order to provide and maintain access to water sources. Refer to BLM Manual 7250 (Water Rights).

CHAPTER 4—POPULATION MANAGEMENT

GENERAL

Under the 1971 WFRHBA, WH&B are to be managed in a manner designed to achieve and maintain a thriving natural ecological balance and protect the range from the deterioration associated with WH&B overpopulation.

4.1 MANAGEMENT REQUIREMENTS

4.1.1 Self-Sustaining

WH&B shall be managed as self-sustaining populations of healthy animals in balance with other uses and the productive capacity of their habitat. Some selected HMAs may be managed for non-reproducing wild horses to aid in controlling on-the-range population numbers (see 4.5.4).

4.1.2 Free-Roaming Behavior

In accordance with 43 CFR 4700.0-6(c), management activities affecting WH&B shall be undertaken with the goal of maintaining free-roaming behavior.

4.1.3 Constraints on Management

Management of WH&B on the public lands is limited to herd areas (HAs), consistent with the WFRHBA (16 USC § 1339) which states: “Nothing in this Act shall be construed to authorize the Secretary to relocate wild free-roaming horses or burros to areas of the public lands where they do not presently exist.”

Consistent with 43 CFR 4710.3-1, herd management areas (HMAs) shall be established for the maintenance of WH&B herds. In delineating each HMA, the authorized officer shall consider the appropriate management level for the herd, the habitat requirements of the animals, and the relationships with other uses of the public and adjacent private lands, and the constraints contained in § 4710.4.

4.1.4 Minimum Feasible Level of Management

As required in 43 CFR 4710.4, management shall be at the minimum level necessary to attain the objectives identified in approved LUPs and HMAPs.

1. Limit population management actions by:
 - a. Establishing AML as a population range within which herd size will be allowed to fluctuate.
 - b. Evaluating HMAs that require frequent emergency or nuisance removals due to inadequate habitat (e.g., limited availability of forage or water) for the possible removal of the area’s designation as an HMA through LUP.

2. It is not consistent with management at the minimal level to provide supplemental feed or rely on water developments that require frequent maintenance. It may, however, be appropriate to provide water in temporary emergency situations.

4.1.5 Thriving Natural Ecological Balance (TNEB)

Consistent with 43 CFR 4700.0-6, WH&B shall be managed in balance with other uses and the productive capacity of their habitat (i.e., WH&B will be managed to achieve and maintain a thriving natural ecological balance (TNEB) and multiple use relationships on the public lands).

The WFRHBA requires the BLM to manage horses in a manner that is designed to achieve and maintain a thriving natural ecological balance on the public lands (16 USC § 1333(a)). *See also Animal Protection Institute of America*, 109 IBLA 112, 115 (1989) (“...the ‘benchmark test’ for determining the suitable number of wild horses on the public range is ‘thriving natural ecological balance’...” (Dahl v. Clark, 600 F. Supp. 585, 594 (D. Nev. 1984))).

To achieve a TNEB on the public lands, WH&B should be managed in a manner that assures significant progress is made toward achieving the Land Health Standards for upland vegetation and riparian plant communities, watershed function, and habitat quality for animal populations, as well as other site-specific or landscape-level objectives, including those necessary to protect and manage Threatened, Endangered, and Sensitive Species (TES). WH&B herd health is promoted by achieving and maintaining TNEB.

4.2 ESTABLISHING THE APPROPRIATE MANAGEMENT LEVEL

4.2.1 AML Definition

The appropriate management level (AML) shall be expressed as a population range within which WH&B can be managed for the long term. AMLs previously established as a single number will be modified to include an upper and lower limit. For reporting purposes, the upper limit of the AML range will be used.

AML applies to the number of adult wild horses or burros to be managed within the population and does not include current year’s foals. All WH&B one year of age and older are considered adults (a foal is considered one year of age on January 1 of the year following its birth).

The AML upper limit shall be established as the maximum number of WH&B which results in a TNEB and avoids a deterioration of the range. This number should be below the number that would cause rangeland damage (refer to *Animal Protection Institute of America v. Nevada BLM*, 118 IBLA 63, 75, (1991)).

The AML lower limit shall normally be established at a number that allows the population to grow (at the annual population growth rate) to the upper limit over a 4-5 year period, without any interim gathers to remove excess WH&B. Some HMAs may require more frequent removals to maintain population size within AML. For HMAs that require more frequent gathers, the authorized officer should consider management options which would either extend the gather

cycle or broaden the AML range; amend or revise the LUP to remove the area's designation as an HMA; or manage the HMA for non-reproducing wild horses.

4.2.2 Establishing or Adjusting AML

An interdisciplinary and site-specific environmental analysis and decision process (NEPA) with public involvement is required to establish or adjust AML.

4.2.2.1 Establishing AML

When establishing AML, the analysis shall include an in-depth evaluation of intensive monitoring data or land health assessment. Intensive monitoring data shall include studies of grazing utilization, range ecological condition and trend, actual use, and climate (weather) data. Population inventory, use patterns and animal distribution should also be considered. A minimum of three to five years of data is preferred. Progress toward attainment of other site-specific and landscape-level management objectives should also be considered. See Appendix 3 (AML Establishment and Adjustment).

4.2.2.2 Evaluation and Adjustment of AML

In-depth AML evaluations should be completed when review of resource monitoring and population inventory data indicates the AML may no longer be appropriate. The following should be considered when evaluating AML:

- Changes in environmental conditions which may have occurred since the AML was established. Changing environmental conditions could include drought, wildfires, noxious weed infestations, effect of varying numbers of WH&B on forage utilization or range ecological condition/trend, an increase or decrease in the available forage, changes in livestock management, etc.
- The presence of any newly listed Threatened, Endangered or Sensitive Species (TES).
- Any additional resource monitoring, population inventory or other relevant data collected since AML was established.

For additional information refer to Appendix 3 (AML Establishment and Adjustment) and BLM Manual Section 4720.3.

4.2.3 WH&B Animal Unit and Animal Unit Month

Wild horses, one year of age or older, count as one (1) Animal Unit (AU) and burros one year of age and older count as 0.5 AU. One Animal Unit Month (AUM) is the amount of forage necessary to sustain one adult horse or two adult burros for one month (or approximately 800 pounds of air dried forage).

4.2.4 Forage Allocations for WHB

The amount of forage available to allocate to WH&B shall be determined through in-depth evaluation of resource monitoring data and following a site-specific environmental analysis and decision process. Forage for WH&B (AUMs) is allocated based on the AML upper limit.

4.3 DETERMINATION OF EXCESS

Before issuing a decision to gather and remove animals, the authorized officer shall first determine whether excess WH&B are present and require immediate removal. In making this determination, the authorized officer shall analyze grazing utilization and distribution, trend in range ecological condition, actual use, climate (weather) data, current population inventory, wild horses and burros located outside the HMA in areas not designated for their long-term maintenance and other factors such as the results of land health assessments which demonstrate removal is needed to restore or maintain the range in a TNEB.

The term “excess animals” is defined as those animals which must be removed from an area in order to preserve and maintain a thriving natural ecological balance and multiple-use relationship in that area (16 USC § 1332(f)(2)). This definition underscores the need to remove excess animals before damage to the range begins to occur.

4.4 PARAMETERS FOR POPULATION MANAGEMENT

4.4.1 Age Structure and Sex Ratio

Age structure and sex ratio influence herd health, social interactions, and population growth rates of reproducing WH&B herds. A herd’s age structure and sex ratio may have been altered by previous selective removal policies or natural mortality and should be estimated from the best available data (e.g., capture records, preparation records, and final gather reports). Most populations will have representatives from each age class, and rapidly growing populations will have a greater proportion of younger WH&B. WH&B populations will produce roughly equal numbers of males and females over time.

In order to maintain the desired age structure and sex ratios, consider retaining male and female animals from each age group (0-4, 5-9, 10-15, 15+ years of age) following a removal operation. If specific age structure and sex ratio objectives are not established for an HMA or complex of HMAs, a desired post-gather age structure and sex ratio should be established during the pre-gather planning and analysis process. These objectives should be consistent with the selective removal criteria outlined in BLM Manual Section 4720.33 and the AML lower limit.

The authorized officer should consider alternatives which would manage WH&B herds for a sex ratio with a female component of less than or equal to 50 percent, to reduce population growth rates and extend the gather cycle. Opportunities to manage sex ratios as a tool to slow population growth rates are discussed later in this chapter.

4.4.2 Selective Removal

Selective removal and release of animals back to the range should be conducted to achieve AML, and the age structure and sex ratio objectives established for the specific HMA or complex of HMAs. In the absence of specific age structure or sex ratio objectives for the HMA or complex, see BLM Manual Section 4720.33.

4.4.3 Population Growth Rates

Population growth rates represent the net difference between births and deaths over time. Population growth rates can be highly variable and influenced by habitat quality, forage production, water availability and other factors. Data from recent gathers and population estimates derived from aerial surveys are used to determine population growth rates. The annual growth rate from Year 1 to Year 2 is calculated as follows:

$$\frac{\text{Population on 2/28 (Year 2)} - \text{Population on 2/28 (Year 1)}}{\text{Population on 2/28 (Year 1)}} \times 100 = \text{Percent Annual Growth Rate}$$

The same formula can be used to calculate growth over a period of several years (e.g., between aerial population surveys which are normally conducted at 3-4 year intervals).

Significant variation from historical growth rates may indicate that either immigration into the HMA or migration out of the HMA is occurring.

4.4.4 Foaling Period

Foaling period can be documented for each population (individual HMA or HMA complex) through direct observation. The capture of wild horses by using a helicopter to herd the animals is prohibited during the foaling period, which is defined as six weeks on either side of the peak of foaling to assure that young foals are mature enough to be able to remain with their band during gather activities. This period is generally March 1 to June 30 for most wild horse herds. Helicopters may be used year-round in the removal of burros. See BLM Manual Section 4740.1.

The capture of wild horses and burros by using bait (e.g., food, water, salt or sexual attraction) to lure animals into a trap may be used year-round.

Population surveys or distribution flights involving fixed-wing aircraft may be conducted during the foaling period. The use of helicopters for these activities during this time should be evaluated on a case-by-case basis.

4.4.5 Gathers and Gather Cycles

The gather cycle is the interval between gathers. Gather frequency is a function of the AML range, population growth rates and other environmental factors. Once AML is achieved, gathers to remove excess WH&B should be planned to occur at intervals of approximately 4 to 5 years to maintain population size within AML.

4.4.6 Genetic Diversity

Reproducing WH&B herd health is dependent, in part, on maintaining desirable genetic diversity (avoiding inbreeding depression).

4.4.6.1 Baseline Genetic Diversity

Baseline genetic diversity will be determined for all WH&B herds. Once a baseline is established, additional samples will be collected to reassess genetic diversity every other gather (e.g., every 6-10 years). If testing indicates diversity is less than desired, the herd should be reassessed more frequently (e.g., every gather).

In the past, genetic diversity was assessed by evaluating blood samples from the herd. Hair samples are now used to assess genetic diversity. Procedures for collecting and processing WH&B hair samples are described in Appendix 1 (Genetics Data and Hair Sample Collection Instructions). A report assessing genetic diversity is developed for each set of samples from an HMA.

Baseline data can be compared between adjacent HMAs to determine if the WH&B herd is isolated, or if genetic material is being exchanged between reproducing herds as part of a larger population of WH&B. Movement of WH&B from one HMA to another may enhance genetic diversity.

4.4.6.2 Interpreting Genetics Data

Measures of individual animal and population-wide genetic diversity are based on the number of individuals sampled within each HMA or complex. The most important measure of genetic diversity is Observed Heterozygosity (H_o). The observed heterozygosity is a measure of how much diversity is found, on average, within individual animals in a WH&B herd and is insensitive to sample size, although the larger the sample, the more robust the estimate.

Population-wide measures for the presence of genetic variants and the effective number of alleles provide information about changes in a herd's diversity, now and in the future. Other measures provide a comparison of the herd's genetic similarity to domestic horse breed types. All measures are compared to values derived from domestic horse breeds and to WH&B herds which have already been sampled.

Values below the mean for feral populations are an indication that the WH&B herd may have diversity issues. Herds with observed heterozygosity values that are one standard deviation below the mean are considered at critical risk. For DNA-based (hair) samples this value is 0.66, and the value is 0.31 for blood samples.

Few herds sampled to date show values below the feral mean. Those with values below the feral mean tend to be herds with small population size, which are the most at-risk for inbreeding. There is no specific diversity value that is a clear indicator of imminent inbreeding risk. The lower the genetic variation, the greater the risks for inbreeding-related impacts to the WH&B

herd. Mitigation to address or resolve genetic diversity concerns should be considered using the recommendations in the genetics report as a starting point.

4.4.6.3 Herd Size

A minimum population size of 50 effective breeding animals (i.e., a total population size of about 150-200 animals) is currently recommended to maintain an acceptable level of genetic diversity within reproducing WH&B populations (Cothran, 2009). This number is required to keep the rate of loss of genetic variation at 1 percent per generation. Animal interchange between adjacent HMAs with smaller population sizes may reduce the need for maintaining populations of this size within each individual HMA. Research has not yet established a recommended minimum breeding herd size for burros.

4.4.6.4 Management Actions

If the recommended minimum wild horse herd size cannot be maintained due to habitat limitations (e.g., insufficient forage, water, cover and/or space) or other resource management considerations (e.g., T&E species), a number of options may be considered as part of an appropriate site-specific NEPA analysis to mitigate genetic concerns:

- Maximize the number of breeding age wild horses (6-10 years) within the herd.
- Adjust the sex ratio in favor of males to increase the number of harems and effective breeding males.
- Introduce 1-2 young mares every generation (about 10 years), from other herds living in similar environments.

If wild horse herd size in small, isolated HMAs is so low that mitigation is not feasible, consideration should be given to managing the HMA for non-reproducing wild horses or to removing the area's designation as an HMA through LUP.

4.4.7 Herd Social Structure

Some management actions (e.g., sex ratio adjustments to favor stallions) may affect social structure and herd interactions (e.g., band size).

4.4.7.1 Wild Horses

The social structure of most wild horse herds consists of breeding and bachelor bands. Breeding bands or harems usually consist of a dominant stallion, lead or dominant mare(s), a group of breeding mares, and associated foals and yearlings. Most wild horses breed and foal in the spring of the year. Bachelor bands consist of various aged males that either have not yet established their own harem or have lost their mares. The composition of bachelor bands varies considerably throughout the year. In most breeding bands, male foals leave the band at 1 or 2 years of age and generally join bachelor bands.

Although wild horse bands tend to use the same habitat areas (home ranges) from year to year, they are not territorial and do not defend preferred habitat areas. As a result, bands often graze

and water near each other, and there may be movement of mares between bands. This, in combination with the periodic displacement of the dominant stallion and removal or death of other horses, results in a very fluid social structure in most herds. These factors are beneficial in enhancing genetic diversity.

4.4.7.2 Wild Burros

Wild burros do not form breeding bands. There are no strong individual bonds other than jenny-foal relationships. Wild burros present themselves as single animals, all-male groups, all-female groups, jenny-foal groups, or mixed groups. All of the groups are variable and their composition may change at any time. This loose social structure, where all animals are potential breeding partners, maximizes genetic diversity in small or dispersed burro populations.

Some of the older jacks establish a breeding territory but do not prevent other males from entering this area unless there is an estrous female present. It is common for males to roam freely throughout their habitat and breed upon encountering an estrous female. Large male groups may form in the vicinity of an estrous female, and it is normal for the jenny to have multiple breeding partners.

In dispersed populations in a desert environment, breeding efficiency increases as the population densities increase. As daily temperatures increase and water availability decreases, more and more animals will gather around the remaining available water sources. These areas become important areas for maximizing breeding efficiency. This temporary or seasonal increase in population density increases the chance for males to encounter estrous females. Thus, although breeding occurs year-round, increased breeding and foaling may occur during this period of time.

4.5 POPULATION CONTROLS

The authorized officer may consider a number of population control methods to achieve and maintain WH&B population size within AML.

4.5.1 Natural Population Controls

The rate at which WH&B herd sizes naturally increase or decrease is affected by a number of factors, including the nutritional value of the forage consumed, weather, disease, and predation. Experience gained in managing WH&B and other large herbivores indicates that soil, vegetation, and water resources are almost always severely damaged before these factors negatively affect population growth rates. Human intervention may be necessary when these factors, acting alone or in combination, do not exert sufficient influence to maintain WH&B population size within AML.

4.5.2 Gather and Removal

When the authorized officer has determined that excess WH&B exist, gathers to capture and remove the animals immediately or as soon as possible are required. For additional information, refer to BLM Manual Section 4720 (Removal) and 43 CFR 4720.1, 4740.1 and 2.

4.5.3 Reduce Population Growth Rates

During gather or herd management area planning, the authorized officer should consider a range of alternatives to reduce population growth rates and extend the gather cycle for all wild horse herds with annual growth rates greater than or equal to 5 percent. Alternatives may include but are not limited to: use of fertility control, adjustments in the sex ratio in favor of males, a combination of fertility control and sex ratio adjustment, and management of selected HMAs for non-reproducing wild horses. Additional management alternatives (tools) may be considered in the future, pending further research (see Chapter 8).

4.5.3.1 Use of Fertility Control as a Tool to Slow Population Growth Rates

- a. Use of Porcine Zona Pellucida (PZP). There are two forms of the conventional PZP agent:
 - The 1-year agent, delivered as a liquid primer injection and follow-up booster one month later; additional boosters must be injected annually by hand or by darting to continue treatment.
 - The 22-month agent that includes the same primer shot as the one-year agent as well as a second injection of three time-release pellets (1-, 3- and 12-month pellets) to booster the vaccine over a 12-month period of time.

Foaling rates of 6 percent in Year One, 14 percent in Year Two and 32 percent in Year Three following treatment compared with 54 percent foaling in untreated controls have been reported for PZP-22 (Turner, 2007). Maximum effectiveness is not achieved unless mares are treated during a 3-4 month window prior to foaling. Research has shown that the best time to apply PZP is during the winter gather season (i.e., November-February).

The use of PZP, under an investigational exemption held by the Humane Society of the United States, requires treated mares to be physically marked (freeze branded) or readily identifiable in order to be compliant with FDA requirements. Application is limited to individuals specifically trained to handle, mix, and administer the product. Post-treatment monitoring in accordance with the Standard Operating Procedures (SOPs) is required.

As part of an appropriate environmental analysis, the authorized officer will analyze the use of the 22-month PZP vaccine in all wild horse herds, particularly those where: (1) the annual herd growth rate is greater than 5 percent and (2) the post-gather herd size is 50 animals or greater. Fertility control will be most effective when treatment of 50-90 percent of all breeding-age mares within the herd is possible using application in conjunction with gathers or remote delivery (darting). Our current understanding is that to maximize treatment effects, at least 90 percent of all mares should be treated.

The authorized officer should apply the 22-month PZP vaccine to all release mares when the NEPA analysis supports its use. In herds where sex ratio adjustments are made, fertility control may be implemented in combination with sex ratio adjustments to further reduce population growth rates.

- b. Increased Use of PZP. One option to slow population growth rates (and reduce the number of excess wild horses removed) would be to gather selected HMAs and apply PZP-22 every 2 years. Because PZP does not totally eliminate reproduction, some excess horses may need to be removed from treated herds over time. Implementation should generally be limited to HMAs that have had high gather efficiencies (i.e., a high percentage of the actual population is captured). Because 70-90 percent of the breeding-age mares may need to be treated to effectively reduce population growth rates, 80-100 percent of the actual population may need to be captured.
- c. Remote Application of PZP. Remote application of the 1-year formulation of PZP is problematic, as it is very difficult to approach most wild horses closely enough to allow darting (i.e., follow-up treatment). Remote application of PZP-22 is not possible at the present time since the pellets must be administered by hand injection.

Remote application of the 1-year PZP agent may be considered for herds where individual horses can be identified (consistent with FDA requirements) and are approachable. Remote application is limited to individuals specifically trained to administer the product by darting.

4.5.3.2 Adjust Male/Female Sex Ratios

The authorized officer should consider alternatives which would manage WH&B herds for a sex ratio with a female component of less than or equal to 50 percent, as this reduces the population growth rate and extends the gather cycle. See Chapter 4 (4.4.1).

Adjusting sex ratios to favor males is another possible management tool which should be considered when the suppression of herd growth rate is desired. This management option should be considered in HMAs and complexes where the low end of AML is greater than 150 animals. Implementation of sex ratio adjustments is most feasible during maintenance gathers (4-5 years after AML is achieved). Sex ratio adjustments may be accomplished by shifting the overall sex ratio to favor males by (1) releasing greater numbers of stallions post-gather or (2) releasing geldings back to their home range following castration. Adjusting the sex ratio so that males comprise 60-70 percent of the adult herd could be considered.

Herd dynamics may change somewhat with adjustments in sex ratios. An increase in the proportion of stallions may have a greater impact when water resources are limited and bands are more concentrated.

Though additional information is needed, geldings are likely to have fewer impacts on the herd's social structure than would an increase in the proportion of stallions. Based on anecdotal observations, geldings released back to their home range: (1) tend to remain near where they were released (with adequate forage and water), (2) form small bachelor groups rather than join

with a reproducing band, (3) maintain better body condition than the herd average because they are sexually inactive, (4) live longer in comparison to sexually active horses, and (5) were easy to recapture (many have been recaptured and released several times).

Post-treatment monitoring should be conducted to observe behavior of individual animals and the herd during the first breeding season following treatment. Monitoring should be designed to determine whether bachelor stallions or geldings interfere with breeding harems, and whether there is increased competition for forage or water. Monitoring should also be designed to determine if the bachelor geldings form bands or intermix with the breeding population and whether band size changes with a greater proportion of stallions. This monitoring information will be used to determine if sex ratio adjustment is an effective population management technique that should be continued.

If post-treatment monitoring indicates that initial introductions of geldings or a greater proportion of stallions have resulted in negative impacts to breeding harems, mitigation could include removal of the additional stallions or geldings in whole or in part, no further introductions of stallions or geldings during future gathers, or release of a larger proportion of mares during the next gather. The need for post-treatment monitoring will decrease as the effectiveness of sex ratio adjustments as a tool to slow population growth rates is determined.

4.5.4 Manage Selected HMAs for Non-Reproducing Wild Horses

Under the WFRHBA (16 USC § 1333(b)(1)), the authorized officer may determine whether AML should be achieved by removal of excess animals, or if options such as sterilization or natural population controls should be implemented. Consistent with this authority, some selected HMAs may be managed for non-reproducing wild horses to aid in controlling on the range population numbers.

4.5.4.1 Manage HMAs for Non-Reproducing Wild Horses

LUPs should identify the HMAs to be managed for non-reproducing wild horses and the criteria for their selection. Completion of additional site-specific environmental analysis, issuance of a decision, and providing opportunity for administrative review under 43 CFR Part 4.21 may also be necessary.

Actual on-the-ground implementation would be influenced by gather efficiency and it may take several gathers to work toward an HMA with non-reproducing wild horses. Animals would be gathered to the extent possible and sterilized for return to the range, or removed. A safe, effective and humane means to sterilize stallions is castration, but a safe, effective and humane means to sterilize females has not yet been perfected. Therefore, initial efforts should focus on returning sterilized males to the HMA of origin. Sterilized males from HMAs with similar environments may be added as long as population size remains within AML. Care should be taken to ensure they are introduced and located near other animals in areas with good water and forage.

4.5.4.2 Manage Reproducing and Non-Reproducing Wild Horses in Selected HMAs

In selected HMAs with large AMLs, management of both reproducing and non-reproducing wild horses could be considered. As an example, non-reproducing wild horses could be geldings released back to their home range HMA following castration. Post-treatment monitoring and/or mitigation would be conducted as discussed in 4.5.3.2 above.

4.6 PRIORITIES FOR GATHER AND REMOVAL

When removal of excess WH&B from the range is necessary, gathers shall be prioritized in the following order:

- Emergencies
- Court Orders
- Nuisance animals (public health and safety)
- Impacts to threatened, endangered, or sensitive species (TES)
- WH&B located outside the HMA in areas not designated for their long-term maintenance
- Landowner request
- To achieve and maintain population size within AML
- Coordinate gathers across State, District and/ or Field Office boundaries and conduct gathers jointly whenever possible to improve gather efficiency and implementation of other population control measures such as application of fertility control and sex ratio adjustments.

4.7 NATIONAL GATHER SCHEDULE

A National Gather Schedule is developed annually based on the need to remove excess WH&B to achieve or maintain AML and the available funding and facility space. Situations that may require adjustments to the National Gather Schedule are: (1) Emergencies and (2) Escalating Problems.

4.7.1 Escalating Problems

Escalating problems are defined as conditions that deteriorate over time. The key indicator is a decline in the amount of forage or water available for WH&B use, which result in negative impacts to animal condition and rangeland health. Causal factors are normally drought or animal numbers in excess of AML. These situations can be detected in advance and are managed through the normal planning process. See BLM Manual Section 4720.21.

4.7.2 Emergencies

Emergencies generally are unexpected events that threaten the health and welfare of a WH&B population and/or their habitat. Examples of emergencies include fire, insect infestation, disease, or other events of a catastrophic and unanticipated nature. Immediate action is normally required. For some emergency actions, it may be appropriate to use alternative means or

procedures to comply with NEPA (see BLM NEPA Handbook, H-1790-1: National Environmental Policy Act Handbook, Chapter 2.3 Emergency Actions). If timeframes permit, a gather plan environmental assessment should be prepared prior to WH&B removal. If this is not possible, emergency actions should be documented and a report prepared after resolution of the problem. Public notification can be addressed through a press release. See BLM Manual Section 4720.22.

4.8 POPULATION MODELING

Version 3.2 of the Winn Equus population model developed by Dr. Steven Jenkins will be used during gather or herd management area planning to analyze and compare the effects of proposed wild horse management. The model is not designed for use on burros.

The model's primary purpose is to analyze and compare the effects of the proposed action (and alternatives) on population size, average population growth rate, and average removal number. Possible management alternatives or strategies may include, but are not limited to:

- Proposals to gather/remove excess animals, with or without fertility control.
- Proposals involving various gather cycles.
- Proposals to make adjustments in sex ratios.
- Proposals to manage all or a portion of a herd as a non-reproducing population.
- Proposals for gate-cut or selective removal gather.
- No Action.

Another objective of the modeling is to identify whether any of the alternatives would be likely to “crash” the population based on a number of stochastic factors (varying environmental conditions).

Use of the Win Equus population model requires the following:

- **Gather Planning:** Run the model for 10 years and 100 trials; select and display the most typical trial.
- **Herd Management Area Planning:** Run the model for 20 years and 100 trials; select and display the most typical trial.
- **Adjustment of Sex Ratios:** Select 100 percent gather for mares and adjust (decrease) the gather percentage for studs to achieve the desired post-gather sex ratio.
- **Results Analysis:** Drop the highest trial and the lowest trial and analyze and compare the remaining trials.

4.9 HUMANE DESTRUCTION

The BLM authorized officer will euthanize or authorize the euthanasia of a wild horse or burro when any of the following conditions exist:

1. Displays a hopeless prognosis for life.

2. Is affected by a chronic or incurable disease, injury, lameness or serious physical defect (includes severe tooth loss or wear, club feet, and other severe acquired or congenital abnormalities).
3. Would require continuous treatment for the relief of pain and suffering in a domestic setting.
4. Is incapable of maintaining a Henneke body condition score greater than or equal to 3, in its present environment.
5. Has an acute or chronic illness, injury, physical condition or lameness that would not allow the animal to live and interact with other horses, keep up with its peers or maintain an acceptable quality of life consistently or for the foreseeable future.
6. A State or Federal animal health official orders the humane destruction of the animal(s) as a disease control measure.
7. Exhibits dangerous characteristics beyond those inherently associated with the wild characteristics of wild horses and burros.
 - a. Dangerous animals are defined as those horses or burros that are unusually aggressive and pose an unacceptable risk of injury to humans or other animals.
 - b. Unusually dangerous horses or burros possess characteristics that are not desirable to breed into the wild herd.
 - c. It is also reasonable to conclude that an average adopter could not humanely care for the animal.

CHAPTER 5—INVENTORY AND MONITORING

GENERAL

The authorized officer is required to identify, plan, collect and analyze the resource monitoring data necessary to prepare resource management plans, plan amendments, gather plans, herd management area plans or other associated environmental documents through which WH&B management decisions are made.

Inventory (monitoring) shall be completed in order to determine:

- If an overpopulation of WH&B exists and action is needed to remove the excess animals.
- WH&B AMLs; and,
- If AMLs should be achieved by removal of the excess animals or other appropriate means.

Monitoring data is needed to support AML establishment and decisions to remove excess WH&B. Various rulings from the Interior Board of Land Appeals (IBLA) underscore the need to base WH&B management decisions on the results of monitoring.

5.1 HABITAT MONITORING

The primary purpose of habitat monitoring is to collect the resource data necessary to:

- Make a determination of excess animals (i.e., support the need to gather and remove excess wild horses or burros).
- Establish or adjust AML.
- Develop or revise HMAPs.
- Evaluate conformance with Land Health Standards, LUP goals and objectives, or other site-specific or landscape-level objectives.

Collection of habitat monitoring data should be coordinated with other resource programs (e.g., range, watershed, wildlife) to maximize efficiency and minimize duplication.

Appendix 2 (Habitat Monitoring References) provides a list of BLM Technical References that can assist in planning for, and collection and evaluation of monitoring data. BLM Technical References can be found at: <http://www.blm.gov/nstc/library/techref.htm>

5.1.1 Annual Monitoring

Annual monitoring objectives include:

- Determine whether or not forage and water is adequate to support the animals in a healthy condition through the remainder of the year.
- Assess and evaluate animal condition.

To achieve these objectives, monitoring efforts should focus on the following:

- Evaluate current year's forage production and water flows.
- Evaluate/measure use, map patterns of use and monitor seasonal distribution/movement.
- Evaluate WH&B body condition.

Data collection to accomplish the above could include:

1. Photographs and Field Inspection Notes. Document observations on current year's growing conditions (average, below average or above average precipitation and soil moisture); plant phenology (are plants maturing earlier or later than normal); and forage production and water flows (average, below normal, above normal). When taking photographs, label each photograph with the date and the location to facilitate re-photographing the area in the future.
2. Use Mapping. Map utilization of current year's growth. Where possible, document forage utilization by WH&B in rest pastures or prior to livestock use. Where separation of use by type of animal is not possible, map total utilization at the end of the season. Use the information collected to identify and establish key areas, determine distribution, and seasonal use areas. If mapping utilization of the HMA on an annual basis isn't possible, focus monitoring on measuring utilization at key areas used by WH&B within the HMA on an annual and continuing basis.
3. Utilization. Estimate the proportion of annual forage production used by herbivores (WH&B, domestic livestock, wildlife, and insects).
4. Residual Vegetation or Stubble Height, Woody Species Use or Streambank Alteration. Measuring stubble height, use on woody species, and the degree of streambank utilization occurring annually (especially in rest pastures or prior to livestock use) may also be helpful in documenting resource impacts associated with WH&B use.
5. Grazing Use Records. Summarize the actual grazing use (animal unit months of forage) by livestock, WH&B, and wildlife by unit or pasture for the year.
6. Weather Data. Document information on temperature, precipitation, and growing conditions.
7. Animal Condition. Using the Henneke Body Condition Scoring (BCS) system, document the number of animals seen, where they were observed, and their BCS class. Document average group size (e.g., animals are concentrating in large groups or scattered, small groups, evidence of lameness, or other possible animal health concerns). This information may be used to assist in the evaluation of TNEB within the HMA.

When collected, data should be filed in the 4710-Herd Management case file and cross-referenced to the applicable rangeland management or other resource monitoring files.

5.1.2 Long-Term Monitoring

The objective of long-term monitoring is to determine whether management is resulting in significant progress toward attaining Land Health Standards, other applicable site-specific or landscape-level objectives, or changes in range ecological condition and trend (up, stable or downward). Data are typically collected by an interdisciplinary team of resource specialists in preparation for a formal and detailed evaluation of current management and its effect on resource conditions.

5.1.2.1 Ecological Sites

Rangeland landscapes are divided into ecological sites for the purposes of inventory, evaluation and management. Each site is defined and described by the Natural Resources Conservation Service (NRCS) based on climate, geology, soils, vegetation and other environmental factors. An ecological site is also described based on its ability to produce and support a characteristic plant community (i.e., kind, amount, and proportion of natural vegetation). Ecological site descriptions can be used to evaluate current management and to identify the potential effects in range ecological conditions or trends that could be expected from proposed changes in WH&B management. Ecological site descriptions for each Major Land Resource Area (MLRA) are available from NRCS. If an area has not yet been inventoried by NRCS, an interdisciplinary team of resource specialists will use the best available data to identify the ecological sites in the HMA.

5.1.2.2 Riparian Areas

Properly functioning riparian areas produce abundant forage, important habitats for fish and wildlife, and improve water quality and quantity. Functional-at-risk riparian areas have one or more attributes which place them at risk of deterioration, while nonfunctional riparian areas are unable to capture sediment, enhance infiltration, recharge aquifers or dissipate high energy flows. Assessments of proper functioning condition can be used to identify issues, establish objectives, and propose and evaluate changes in WH&B management.

5.1.2.3 Key Areas

Key areas are selected to monitor changes in range ecological condition or trend across representative areas within the HMA or complex which may result from current WH&B management. Key areas may be selected to represent a particular plant community or a specific ecological site. They should also be selected to represent ecological conditions and trends, utilization or use patterns, seasonal distribution, and resource production within the HMA or complex.

Long-term monitoring within key areas may include measurements of frequency, production, and cover (canopy cover, foliar cover, ground cover and basal cover). Plots are generally read at intervals of 5-10 to 15-20 years.

5.1.2.4 Key Species

Key plant species are selected for forage utilization studies. Key species are important forage species within plant communities that can indicate changes in resource conditions resulting from WH&B management. More than one key species may be selected, depending on management objectives.

Key forage species are used to indicate the allowable degree of forage utilization on a key area which promotes attainment of attaining vegetation management objectives. They may be identified during land use planning, or result from habitat management objectives established during site-specific planning efforts such as herd management area planning.

5.1.3 Integrated (Interdisciplinary) Resource Monitoring Plans

Development of integrated (interdisciplinary) resource monitoring plans can help assure that the data needed to support WH&B management decisions is collected in an effective and efficient manner. Resource monitoring plans should identify the following:

- **Who** (The resource specialty responsible for data collection, i.e., WH&B specialist, range specialist, etc.).
- **What** (Data to be collected).
- **When** (Time of year data should be collected and how often).
- **Where** (Location(s) for data collection, i.e., location and documentation of key areas).
- **Why** (The specific monitoring objective).
- **How** (Methods to be used).

Also refer to Appendix 4 (Table 4.2).

5.2 POPULATION MONITORING

An accurate and current assessment of WH&B health and condition, as well as population size, growth rate, and distribution, is needed for proper WH&B management. At a minimum, population surveys should be conducted every 2 years whenever possible, and within 6-12 months prior to establishing the need to gather and remove excess WH&B.

5.2.1 Population Estimation

WH&B population size should be estimated primarily by aerial survey. See BLM Manual Section 4710.45.

1. Aerial surveys will be conducted and documented using standardized sampling methods and procedures. Survey methods (types of aircraft and techniques) should utilize the most effective and cost-efficient techniques for the specific HMA or complex.
2. To permit comparison with prior data and detect population trends, aerial surveys should be conducted during the same time of the year, using the same or similar type of equipment, methodology, and personnel.

3. The following data should be recorded during aerial surveys:
 - HMA name and number
 - State/District or Field Office
 - Survey date
 - Observer(s) name
 - Weather conditions
 - Type of aircraft used
 - Altitude
 - Flight time
 - Time of day
 - Survey method (direct count, simultaneous double-count, mark-resight, etc.)
 - Flight path, number and location of animals seen in GPS/GIS data format
 - Number of adults, number of foals
 - Basic herd health and condition information
 - Basic information about range, forage or water conditions, wildlife, or livestock use, etc.
4. In areas where gather efficiencies have been historically low or WH&B range widely, a post-gather survey should be conducted in the 6-12 months following gather completion to obtain a more accurate estimate of the number of WH&B left on the range.
5. Monitoring WH&B distribution is critical in identifying seasonal use areas, determining movement patterns and identifying areas for habitat monitoring. While seasonal distribution may vary over the years, movement is normally related to the abundance and quality of the forage, climate, weather patterns, and availability of water.
6. The HMA monitoring file shall contain a permanent record of data collected during the aerial surveys and the results should be entered into the Wild Horse and Burro Program System (WHBPS) and the local GIS data base.

5.2.2 Herd Condition and Health Monitoring During Gatherings

The condition class of individual horses should be evaluated and documented during gatherings using the Henneke Body Condition Scoring System (refer to H-4760-1: Compliance Handbook).

1. Data should also be collected on age structure and sex ratio. This information can be used to evaluate the effects of the management actions on herd health and condition.
2. Estimate the number of WH&B left on the range (number remaining ungathered) following each gather.
3. Other data that may be collected during gather operations include: parasite load, disease (from blood samples), percentage of pregnant mares (through analysis of blood or fecal samples), and/or the effects of fertility control.

4. The incidence of albinism, parrot mouth, club feet, severely crooked legs or other physical deformities should also be documented and the subject animals removed from the population when possible. The incidence of these traits should be minimized within individual herds over time.

CHAPTER 6—HERD MANAGEMENT AREA PLANNING

GENERAL

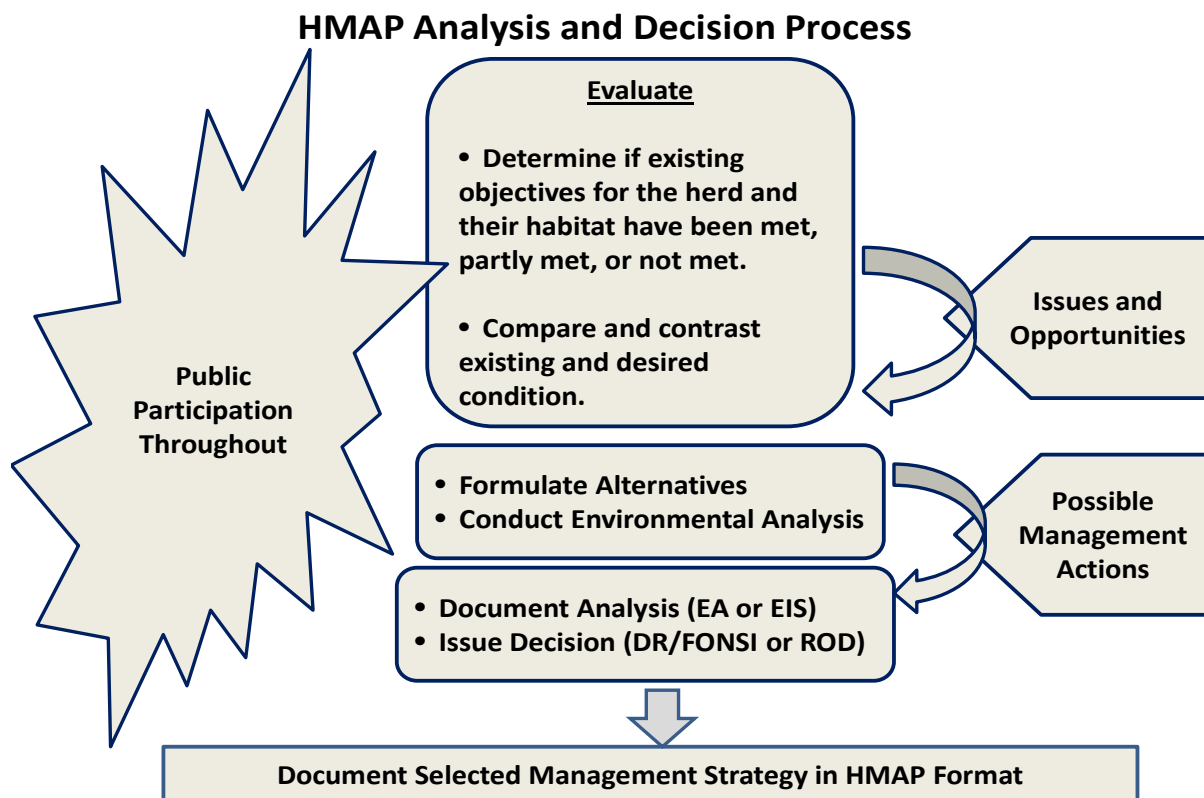
Herd Management Area Plans (HMAPs) identify and set objectives for WH&B herds and their habitat. HMAPs are prepared with public involvement through a site-specific environmental analysis and decision process (NEPA). During the NEPA process, the environmental impacts associated with a range of alternative management strategies for the WH&B herd and its habitat is analyzed.

The approved HMAP outlines the selected management actions, together with the management and monitoring objectives which, when implemented, would make progress toward achieving land health standards, LUP goals/objectives, and other relevant objectives.

6.1 HMAP ANALYSIS AND DECISION PROCESS

An overview of the HMAP analysis process is provided in Figure 6.1. Also refer to Appendix 4 (Herd Management Area Planning) for additional information.

Figure 6.1
Overview of the HMAP Analysis and Decision Process



6.1.1 Evaluate Current Management

The first step in the HMAP analysis process should generally be to evaluate existing management. At the conclusion of the management evaluation, a report will be prepared and made available to the public for a 30-day review and comment period (public scoping). To facilitate public review, the document will be posted on the state, district or field office web page.¹ The management evaluation report is not a decision subject to administrative appeal.² Rather, the report documents the key issues identified as a result of the management evaluation. A range of the possible management alternatives (Proposed Action and Alternatives) that would address or resolve the identified issues may also be identified. The range of alternative may be expanded as a result of scoping comments.

Key steps in the management evaluation process include:

1. Review existing goals and objectives for the herd and its habitat and determine whether these have been met, partly met, or not met. Incorporate a summary of the rationale supporting BLM's determination in the evaluation report.
2. Compare and contrast the existing and desired condition for the herd and its habitat. Refer to the information in Chapter 3 (Habitat Management) and Chapter 4 (Population Management) as a starting point for the analysis.
3. Document the gaps (or differences) between the current and desired conditions. These differences represent the issues to be addressed and resolved (i.e., the purpose and need for action).
4. Identify the possible management actions that could be implemented in response to the identified issues.
5. Formulate a range of alternative management strategies for the herd and its habitat from the list of possible management actions (Proposed Action and Alternatives). Each alternative considered should meet the purpose and need for action and respond to the identified issues in whole or in part.
6. Finalize the management evaluation report and provide it to the public for a 30-day review and comment period (i.e., public scoping).

6.1.2 Conduct and Document the Site-Specific Environmental Analysis

As a next step, conduct and document the interdisciplinary, site-specific analysis of potential impacts that could result from implementation of the No Action (generally defined as "Continue

¹ If an Environmental Impact Statement (EIS) is prepared, scoping will be conducted following issuance of a Federal Register Notice.

² Once the HMAP decision is made, the Evaluation Report is part of the administrative record for that decision.

Existing Management” for HMAP development and analysis), the Proposed Action, and other action alternatives. Refer to H-1790-1: National Environmental Policy Act Handbook.

Though it may be appropriate in some instances to prepare an Environmental Impact Statement (EIS), normally an environmental assessment (EA) is prepared to document and analyze an HMAP decision. The section below provides guidance about how an HMAP EA may be structured.

6.1.2.1 Preparing the HMAP Environmental Assessment (EA)

1. Introduction. Limit the information included in the “Introduction” section of the EA to the minimum needed to allow the reader to understand the existing situation. Include a brief description of the HMA and its location, and the AML (and when/how it was established). Describe the purpose and need for the Proposed HMAP. Identify the relevant issues, summarize the results of public scoping, and document how the BLM used the comments in preparing the preliminary environmental assessment. Tier the analysis to applicable decisions in the LUP.
2. Proposed Action and Alternatives. Each alternative considered in detail in the EA shall meet the purpose and need for action and respond to the identified issues to varying degrees. The range of alternatives considered will include a No Action Alternative (i.e., Continue Existing Management) and the Proposed Action (Proposed HMAP). Other alternatives should be developed in response to the purpose and need and the identified issues, as appropriate.

Each alternative will describe the strategy to be used to manage the herd and its habitat over the long-term, together with the associated management, monitoring and implementation objectives. In formulating the alternative management strategies, various management tools may be considered to protect, control and manage WH&B populations and their habitat. For example, consider differing gather seasons or methods, various tools to slow population growth, or various habitat improvement tools, projects or techniques.

3. Management Objectives and Actions. Management objectives and actions may differ by alternative. This section of the EA would summarize the objectives and actions specific to each alternative.

For each alternative specify: (a) the proposed habitat and population management objectives, (b) the associated management actions (e.g. implementation objectives), and (c) the proposed monitoring objectives. These objectives and actions should conform to and be consistent with LUP goals.

- a. SMART Objectives. Well-written objectives should be specific, measurable, achievable/attainable, reasonable/relevant and trackable within a specified timeframe (SMART):

- 1) Specific: Specifies what and where.
- 2) Measurable: Identifies the amount of change expected; desired change can be measured or observed.
- 3) Achievable/Attainable: Realistic for the specific site conditions.
- 4) Reasonable/Relevant: Limited in scope, within the BLM's control and influence, measures results (not activities).
- 5) Trackable/Timeframe: Identifies where the activity will occur, short- and long-range targets, as well as interim steps and a plan to monitor progress.

b. Habitat Objectives. Habitat objectives may involve vegetation, trend or key area objectives for upland vegetation or riparian plant communities within the HMA or complex or objectives to maintain or improve the wild, free-roaming behavior of the population. Site-specific objectives to improve habitat conditions (e.g., forage or water) may also be established.

Examples of SMART Objective(s)

- Improve riparian condition from functioning at-risk (FAR) in 1998 to properly functioning condition (PFC) by decreasing utilization from heavy to moderate within a ½ mile circumference of Bird Spring.
- Adjust sex ratios from 40 percent studs and 60 percent mares in 2010 to 60 percent studs and 40 percent mares by 2014.

c. Population Objectives. These objectives would establish a framework for management of the WH&B herd over the longer term. Objectives could include when and how AML would be adjusted in the future, or when and how the population within the HMA would be gathered. Among other population management parameters, objectives may be identified for desired age structure and sex ratio, animal condition, phenotype, genetic diversity, population growth rate, or selective removal criteria. These objectives may be based on historical attributes or other management considerations.

d. Monitoring Objectives. As necessary, identify a monitoring objective that would measure the progress made toward achieving proposed habitat or population management objectives.

e. Implementation Objectives (Management Actions). Implementation objectives are management actions that, when implemented, are expected to make progress toward attaining the proposed habitat or population management objectives. These could include application of fertility control, adjustment of sex ratios to favor males, or other actions to slow population growth, management actions to assure genetic diversity or achieve the desired sex ratio or age structure for the WH&B herd, or range improvement projects.

4. Description of the Affected Environment and Environmental Impacts

- a. General Description of the Affected Environment. This section of the EA should include a concise general description of the HMA or HMA complex. Voluminous material may be included in the EA appendix. Maps, tables, charts or graphs may also be useful in summarizing or displaying relevant information. Information could include:
- 1) General information about the HMA or complex's size, location, acres of public land or other land ownership, general description of topography, elevation, climate, and dominant vegetation.
 - 2) A summary of the WH&B herd's history using best available data. This could include the probable origin of the WH&B population, identification of the general type of WH&B historically occupying the HMA, any interchange between this herd and adjacent HMAs, known genetic diversity (observed heterozygosity or H_o) and any introductions of WH&B from another HMA.
 - 3) A brief discussion of any historic adjustments that have been made in the HA/HMA boundary, and the name and date of the decision document(s) used to initiate those adjustments. Maps or descriptions of HA/HMA boundaries may also be included.
 - 4) Initial forage allocations together with the existing AML range. The name and date of any decision document(s) used to establish or adjust AML along with a brief description of the causal factors leading to the change.
 - 5) Any population and habitat management actions or events that have impacted herd size including scheduled, emergency or nuisance animal gathers, application of fertility control, and the occurrence of catastrophic events such as extended drought or wildfire.
 - 6) A concise list of applicable LUP decisions that affect the HA/HMA, including any constraints on WH&B distribution and management (voluminous information can be included in an appendix to the EA).
 - 7) A list of applicable Land Health Standards (these may be included in an appendix to the EA or an internet address can be provided if they are available on the internet).
 - 8) Brief descriptions of other resource values and uses relative to the management of WH&B, as appropriate. This could include: authorized and/or actual livestock use, TES species and their habitat, Wilderness, Wilderness Study Areas (WSAs), etc.

- b. Description of the Affected Environment and Environmental Impacts. For each element of the human environment that has the potential to be affected by the Proposed Action or alternatives, describe the existing situation (affected environment). Also describe the direct and indirect impacts to these resources that could result from implementation of the Proposed Action and Alternatives.
5. Cumulative Impacts. The National Environmental Policy Act (NEPA) regulations define cumulative impacts as impacts on the environment that result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such actions (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

In assessing the cumulative impacts associated with preparation of a proposed HMAP, first define the area of potential effect—cumulative impacts will be evaluated within the area of potential effect.

Next define the issues and resource values identified during scoping that are of major importance (in accordance with the 1994 BLM *Guidelines for Assessing and Documenting Cumulative Impacts*, the cumulative impacts analysis should be focused on only those issues and resource values identified during scoping that are of major importance).

6. Public Review and Comment. The HMAP environmental assessment shall be made available to the public for a 30-day review and comment period by posting on the state/district or field office web page. See H-1790-1 for instructions if an EIS has been prepared.
 7. Finalize the HMAP EA. Soliciting public comments obligates reviewers to give fair consideration to the input received. Summarize the results of public review and comment and document how the BLM used the comments in finalizing the environmental assessment.

6.1.2.2 Prepare the Decision Record and Finding of No Significant Impact (FONSI) or an EIS and Record of Decision (ROD)

Based on the analysis of potential environmental consequences, the authorized officer will determine whether to prepare an EIS or issue a Decision Record (DR) and “Finding of No Significant Impact” (FONSI). A FONSI documents why implementation of the selected alternative will not result in environmental impacts that significantly affect the quality of the human environment. The DR identifies the authorized officer’s final decision and is a separate and subsequent document to the FONSI. See H-1790-1 for additional information.

If an EIS has been prepared, due to the potential for significant environmental impacts, the authorized officer’s final decision will be documented in a Record of Decision (ROD).

6.1.2.3 Prepare the HMAP

As a final step and to facilitate on-the-ground implementation, document the selected management strategy, together with the habitat and population management, monitoring and implementation objectives in HMAP format. The HMAP shall be included as an attachment to the authorized officer's final decision.

The approved HMAP should include the following components:

- **Introduction.** Briefly introduce or summarize the relevant background information (repetition of detailed information incorporated in the NEPA document is not required in the approved HMAP).
- **Management Strategy.** Summarize the selected management strategy as outlined in the EA together with the site-specific habitat and population objectives and management actions established to accomplish the objectives.
- **Monitoring and Evaluation Plan** (refer to 6.1.2.3.1).
- **Tracking Log/Project Implementation Schedule** (refer to 6.1.2.3.2).

6.1.2.3.1 Resource Monitoring Plan/Schedule

The HMAP shall include a resource monitoring plan and schedule that will be used to facilitate the timely and effective completion of habitat and population monitoring. The plan should identify the specific monitoring item, the methodology to be used, the resource specialty needed to complete the monitoring (e.g., field office WH&B specialist, rangeland management specialist, wildlife biologist, etc.), where and when monitoring should occur, as well as any actions to be taken to adjust or adapt management as needed and appropriate pending monitoring results. The plan should include both habitat and population monitoring components. See Appendix 4 (Table 4.2).

6.1.2.3.2 Tracking Log/Project Implementation Schedule

The HMAP will include a tracking log and project implementation schedule to facilitate and monitor plan implementation. The tracking log may be developed in a tabular format, and will list the selected habitat and population management actions (what), the entity responsible for implementation (e.g. who -- BLM, USFS, volunteer groups, etc), and define where, when, and how often the action is to be completed. Columns to document the date the action was completed and/or implemented and for any remarks (e.g. project numbers from BLM's Rangeland Improvement Project system, etc) should also be included. See Appendix 4 (Table 4.3).

6.2 HMAP MONITORING AND EVALUATION

Resource (habitat and population) monitoring data should be analyzed periodically to determine whether minor adjustments in management are needed (adaptive management). Periodic evaluations are conducted to assure HMAP implementation is on track and to gauge progress toward achieving the selected habitat and population management and other relevant objectives. Refer to the process outlined in 6.1.1.

The goals for HMAP monitoring and evaluation are twofold: (1) to track implementation of the management actions/decisions outlined in the HMAP (implementation monitoring); and (2) to collect the data/information necessary to evaluate the effectiveness of those decisions (effectiveness monitoring).

1. Implementation Monitoring. Implementation monitoring tracks implementation of the selected management actions. It answers the question “Did we do it?” To assure selected management actions are being implemented in a timely manner, annual review is recommended.
2. Effectiveness Monitoring/HMAP Evaluation. Plan evaluation is the process of periodically reviewing the HMAP to determine if it is effective in making progress toward or accomplishing the approved habitat and population management objectives (plan evaluation typically occurs at intervals of 5, 10 or 15-20 years). Effectiveness monitoring answers the question “Did it work?”

The HMAP shall also be evaluated to determine: (1) whether management goals and objectives are still appropriate or need to be revised, and (2) whether progress is being made toward achieving the goals and objectives, or additional management actions are needed (adaptive management). Evaluation of the HMAP could also be completed in conjunction with land health assessment.

Evaluations that highlight the need for substantial changes may require consultation with interested public as well as appropriate NEPA analysis and documentation prior to implementation.

6.3 4710 CASE FILE

A 4710-Herd Management Area file shall be established for individual HMAs or complexes. The case file should include (but is not limited to) the following:

- A copy of the HMAP.
- HMA and HA maps.
- The associated NEPA and BLM decision documents (or a cross-reference to those documents).
- Any correspondence pertaining to HMA management.
- Aerial survey results.

- Field inspection reports and monitoring data (or a cross-reference to the applicable rangeland management or other case files).
- Information on habitat improvement projects (or a cross-reference to the applicable rangeland management or other case files).
- Final gather reports.
- Fertility control reports, if applicable.
- Results from periodic HMAP evaluations.

Additional 4710 case files may be created if the number and type of monitoring studies is large and varied (e.g. 4710-1, 4710-2, etc).

Relevant data and information should also be entered in a timely manner into WHBPS, as appropriate.

HA/HMA maps and a record of the HA/HMA history should be included in the 4710 HMA file. However, the HA and HMA boundaries delineated in the State GIS data base and provided to the National Coordinator for upload into the National Data Set serve as the official record. Any future changes to HA or HMA boundaries should be documented in the State GIS data base as well as in the HMAP file.

CHAPTER 7—DECISIONS AND APPEALS

7.1 DECISIONS

Implementation decisions form the basis for approval of on-the-ground management actions. When implemented, these actions further the incremental progress toward achieving LUP goals and objectives, Standards for Land Health, or other site-specific habitat or population management objectives. If proposed management is not in conformance with the LUP, the proposal shall be modified or rejected, or the LUP shall be amended or revised.

WH&B implementation decisions can include:

- Establishing or adjusting AML
- Developing HMAPs
- Population management actions
- Habitat improvement projects

Program-specific procedures must be followed when issuing a decision. WH&B implementation decisions can be made in a variety of ways and administrative review (appeal) requirements may vary based on the decisions made (Figure 7.1).

**Figure 7.1
Decisions and Appeals Process**

An Overview

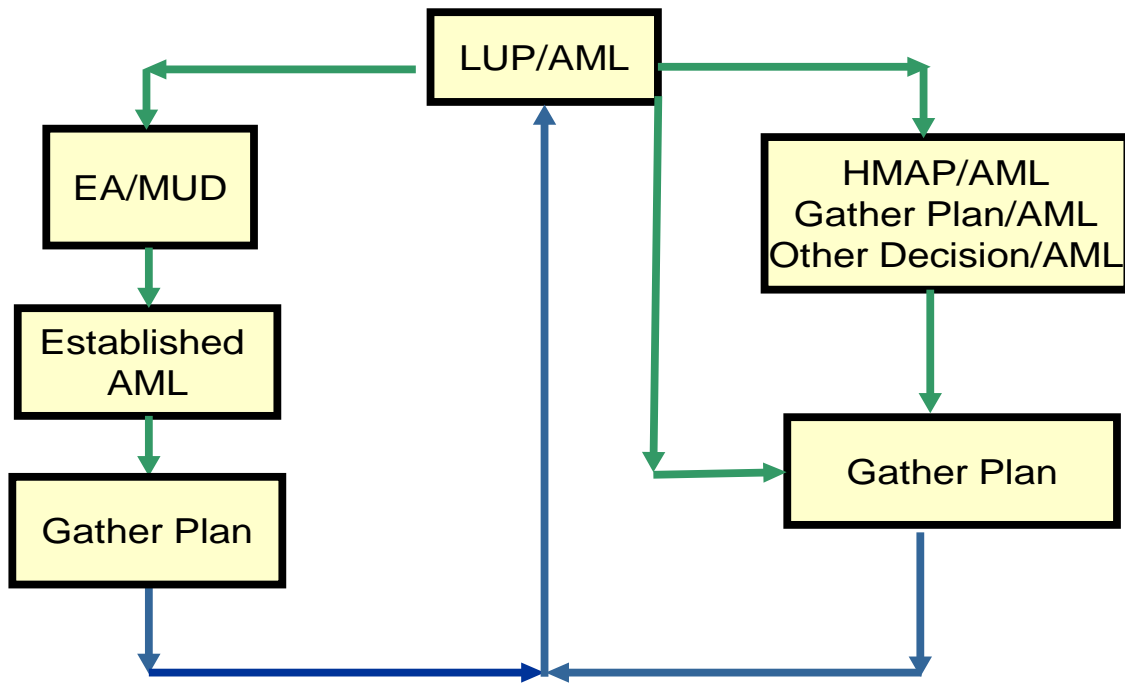
Authority	43 CFR 4770.3(c)	43 CFR Part 4.21
Decision Type	Decisions to Gather/Remove Excess WH&B	AML, HMAP or Project Decisions
Effective Date	<ul style="list-style-type: none"> • <i>Emergency Removal Decisions:</i> make effective upon issuance. • <i>TNEB Removal Decisions:</i> make effective on a date specified in the decision (e.g., 31-76 days prior to proposed gather start). 	Effective the day after the appeal period expires (i.e., 31 days) unless a petition for stay is filed.
Administrative Review Timeframe	Appeals and petitions for stay must be filed within 30 days of the date of the decision.	
Implementation Timeframe	Unless a petition for stay is granted, the gather and removal may proceed as outlined in the authorized officer’s decision.	The authorized officer’s decision may be implemented immediately if the Appeals Board either denies the petition for stay or fails to act on it within 45 calendar days of the expiration of the time for filing a notice of appeal.

* AML decisions issued as MUDs are heard by a OHA/ALJ and are not implementable until OHA has ruled.

7.1.1 AML Decisions

AML decisions determine the maximum number of WH&B to be managed in the HMA that results in a TNEB and avoids a deterioration of the range. Decisions to establish or adjust AML or establish a population range if the AML was initially set as a single number, can be made in a number of ways (refer to Figure 7.2).

Figure 7.2
AML Decisions



AML decisions are generally implementation decisions as compared to LUP decisions. All AML decisions must meet the following criteria:

1. AML is set based on in-depth analysis of site-specific resource monitoring data including grazing utilization, trend in range condition, actual use and climatic factors (i.e., AML is not set based on administrative convenience or single surveys); and
2. Guidelines and criteria for adjusting herd size are included. Refer to *Dahl v. Clark*, 600 F. Supp. 585 (D. Nev. 1984); *Animal Protection Institute*, 117 IBLA, 208, 219 (1990); and *Animal Protection Institute*, 109 IBLA 112, 118 (1989).

AML decisions may also be made through:

- Issuance of WH&B (single-use) decisions.

- Issuance of multiple-use decisions (MUDs, which allocate forage for domestic livestock, wildlife and WH&B).
- As a part of HMAP decisions.
- As part of gather/removal plan decisions.

AML is not generally established or adjusted as part of the gather planning (NEPA) process due to the in-depth and complex nature of the analysis required. Complexity also increases if allocation of the available forage for use by wildlife, livestock and WH&B will be made concurrently (e.g., MUDs).

If the authorized officer elects to formally review AML as part of the same environmental document which evaluates the proposed removal, the AML decision should be separated from the gather/removal decision. This may be accomplished by issuing separate Decision Records:

1. Gather/removal decision.
2. AML decision.

Separation of the two decisions is desirable because there are different rules governing the timing and appeals process for those decisions:

- Under 43 CFR 4770.3(c), the authorized officer can make decisions to remove wild horses or burros from public or private lands effective upon issuance or on a date specified in the decision, where removal is needed to preserve or maintain a thriving ecological balance and maintain a multiple use relationship.
- The authorized officer does not have similar authority with respect to issuing AML decisions, which, if no petition for stay is filed, become effective on the day after the expiration of the appeals period. See 43 CFR § 4.21(a)(2).

7.1.2 Gather/Removal Decisions

Prior to removing WH&B from public lands, the authorized officer must make a determination, based on current information, that excess animals are present and their removal is necessary to restore a TNEB and multiple-use relationship. BLM's authority to remove excess animals from public lands is found in 16 USC § 1333(b)(2) of the WFRHBA (as amended). This provision requires the BLM to immediately remove the animals upon determination that excess WH&B exist, so as to achieve appropriate management levels, restore a thriving natural ecological balance, and protect the range from the deterioration associated with the overpopulation.

In making the determination that excess WH&B are present and require immediate removal, the authorized officer will analyze current information including grazing utilization and distribution, trend in range ecological condition, actual use, climate (weather) data, current population inventory, WH&B located outside the HMA in areas not designated for their long-term maintenance and other factors which demonstrate removal is needed to restore or maintain the range. Justifying a removal based on nothing more than the established AML is not acceptable.

7.1.2.1 Environmental Analysis (Gather Plans)

The following tools can be used to focus the discussion during the site-specific environmental analysis conducted for Gather Plans:

1. Limit the analysis to that needed to determine the potential impacts associated with the Proposed Action and Alternatives, including No Action. Refer to H-1790-1 for a detailed discussion of the appropriate components of a NEPA analysis.
2. Tier the analysis to LUPs, HMAPs, or other relevant decision documents, as appropriate.
3. Incorporate previous analysis or decisions by reference (e.g., reference to previous AML decisions, HA/HMA boundary decisions, etc), as appropriate.

These tools allow reference to the information without the need to either include the documents in whole or in part, or to restate the information in voluminous detail.

7.1.2.2 Decision Record (Gather Plan)

Unless an emergency situation exists, gather/removal decisions shall be issued 31-76 days prior to the proposed gather start to provide an opportunity for administrative review of the authorized officer's decision to be completed. The Decision Record (DR) for Gather Plans that are documented in an environmental assessment should:

1. Summarize the substantive comments received and describe how BLM used these comments to finalize the environmental assessment. See 7.2 for additional information.
2. In accordance with 43 CFR 4770.3(c):
 - The authorized officer will issue gather decisions effective upon a date established in the decision in situations where removal is required by applicable law, or is necessary to preserve or maintain a thriving natural ecological balance and multiple use relationship.
 - When an emergency situation exists, and timeframes permit, a Gather Plan EA should be prepared and the decision should be made effective upon issuance. See BLM Manual Section 4720.36.
3. Cite the regulatory authority upon which the decision is based.
4. Explain the timeframe and procedures for filing an appeal.
5. Describe the procedures for requesting a stay of the action under 43 CFR 4.21.

7.1.3 Other Management Decisions

Other management decisions may include:

- Approval of HMAPs that establish site-specific population or habitat objectives or actions.
- Project-specific decisions (i.e., water development construction or reconstruction, etc.).

These decisions are made following site-specific environmental analysis (NEPA) with public involvement and are subject to administrative review (appeal) under 43 CFR 4.21.

7.1.4 Actions Excluded from Further NEPA Documentation

Certain actions may be categorically excluded from NEPA analysis (refer to H-1790-1, Chapter 4, Categorical Exclusions). Other actions may have already been adequately analyzed through NEPA and a Determination of NEPA Adequacy (DNA) may be prepared.

Before conducting a new NEPA analysis for a proposed Gather Plan, existing NEPA documentation should be reviewed to determine if it is adequate (i.e., review previous Gather Plan EAs together with the associated Decision Records and Findings of No Significant Impact). Changes in numbers of WH&B since the previous gather that result in changes in forage utilization, use patterns, and/or ecological conditions and trends, or changing environmental conditions such as drought, wildfire, noxious weed infestations, and others, may require that a new NEPA analysis be conducted.

If the existing NEPA documentation appears to be adequate, consult with the Office of the Solicitor to determine whether the issuance of a DNA may be appropriate.

7.2 PUBLIC INVOLVEMENT

The authorized officer may conduct public scoping. See H-1790-1, Chapter 6.3.

The authorized officer will provide the public 30 days to review and comment on the NEPA document, typically an Environmental Assessment that documents and analyzes the environmental effects of the BLM's Proposed Action.

The authorized officer shall make Gather Plan EAs and DNAs available to interested individuals, groups, and agencies for a 30-day review and comment period, except when an emergency situation exists. The NEPA document(s) identified in the DNA (e.g., the EA and Finding of No Significant Impact (FONSI)) will also be made available to the public for information.

The authorized officer should consider substantive comments and summarize how they were addressed in the NEPA document or DNA for the Gather Plan. This summary should be presented in the NEPA document, the DNA, or the decision document. See H-1790-1, Chapter 6.9 for additional information.

Possible options for responding to substantive comments include:

- Modifying one or more of the alternatives.
- Developing and evaluating additional alternatives.
- Supplementing, improving, or modifying the analysis.
- Making factual corrections.
- Explaining why the comments do not warrant further agency response, citing cases, authorities or reasons to support the BLM’s position.

When an EIS has been prepared, follow the guidance provided in H-1790-1, Chapter 9.

7.3 APPEALS (ADMINISTRATIVE REVIEW)

Any party who is adversely affected by a final decision of the authorized officer may file an appeal and request a stay of the action. WH&B decisions are subject to administrative review (appeal) and remedies under the provisions of 43 CFR 4.21, 4.410, and 4770.3.

As a general matter, WH&B decisions will not become effective during the time in which a person adversely affected may file a notice of appeal. Unless a petition for a stay pending appeal is filed together with a timely notice of appeal, these decisions will become effective on the day after the expiration of the time during which a person adversely affected may file a notice of appeal (generally 31 days from the decision date). If a petition for stay pending appeal is filed together with a timely notice of appeal, a decision will become effective immediately if:

- The stay request is denied; or,
- The Interior Board of Land Appeals fails to act on the petition for a stay within 45 days from the date of the decision.

Under certain circumstances, however, the authorized officer may make decisions to gather/remove excess wild horses or burros effective upon issuance or on a date specified in the decision. See 43 CFR 4770.3(c).

7.3.1 AML Decisions

AML decisions are subject to administrative review:

1. When administrative review of multiple-use decisions (MUD) is requested, BLM may ask to combine the wild horse decision with the grazing decision for review by an administrative law judge (ALJ) in the Office of Hearings and Appeals (OHA).

Under the authority provided in 43 CFR 4770.3 (c), the authorized officer may make decisions to gather/remove excess wild horses or burros effective upon issuance or on a date specified in the decision.

When issued under this authority, the gather may be implemented unless a stay is granted or a Federal Court enjoins the gather.

2. Wild horse decisions are subject to administrative review by the Interior Board of Land Appeals (IBLA) in accordance with 43 CFR 4.21 and 4.410.

7.3.2 Gather/Removal Decisions

The authorized officer has the authority to make decisions to gather and remove excess WH&B effective upon issuance or on a date specified in the decision when removal is court ordered or is needed to preserve a thriving natural ecological balance and multiple use relationship.

Any party who is adversely affected by the authorized officer's final decision may file an appeal and/or request a stay of the action with the Interior Board of Land Appeals (IBLA). The appeal and/or request for stay must be filed within 30 days from the date of the decision and in accordance with the regulations found at 43 CFR 4.411(a).

7.3.3 HMAP or Other Management Decisions

AML, HMAP, or other management decisions are subject to administrative review through the IBLA under provisions of 43 CFR 4.21 and 4.410. Under this authority, decisions **cannot** be implemented effective upon issuance or on a date specified in the decision.

A notice of appeal must be filed in the office of the authorized officer within 30 days from the date of the decision. See 43 CFR 4.411.

CHAPTER 8—RESEARCH

GENERAL

Direction to conduct research is contained in the WFRHBA, 16 U.S.C. § 1333(b)(2)(C)(3), and the Strategic Plan for Management of Wild Horses and Burros on Public Lands (1992). In late 2000, the Midcontinent Ecological Science Center of the U. S. Geological Survey (USGS) was charged with developing a strategic research plan for the management of WH&B. The purpose of the strategic planning process was to:

- Review past progress and identify problems that could be addressed with research.
- Set broad research goals central to the BLM's mission for WH&B management.
- Establish specific, time-bound, measurable research goals, and strategies to achieve them.
- Evaluate the progress towards those goals at set time periods, and to readjust the planning as needed.

There had been no previous prioritization of the BLM's WH&B research and management needs, and no effort to develop a strategy for fulfilling those needs within a specified time period. The strategic planning process was designed to fill this void.

8.1 STRATEGIC RESEARCH PLAN

The Strategic Research Plan for Wild Horse and Burro Management identified research priorities to include health and handling, fertility control, population estimation and modeling, genetic conservation, habitat assessment and setting population goals. The components of fertility control and population estimation have been implemented and research is being conducted. Genetic diversity of WH&B herds is being evaluated. Other research projects may be initiated as needed to support the management of WH&B. Research results will be used to improve management practices within the WH&B program.

8.1.1 Development

The Strategic Research Plan was a joint effort between the USGS, the BLM, the Animal and Plant Health Inspection Service (APHIS), and the U.S. Department of Agriculture (USDA). The plan was developed over a period of 2 years with input from 39 subject area experts representing 11 universities, 3 Federal agencies (BLM, USGS, APHIS), and two State wildlife agencies.

The USGS took the lead role in planning and coordinating meetings of the expert committees and in drafting the Strategic Plan based on committee and agency input. Assisting in this effort were the BLM's National WH&B Research Coordinator and equine health experts from APHIS.

Principal input from the USGS was focused on topics of contraception, aerial population estimation, population modeling, and genetics. Principal input from APHIS was focused on topics of disease and animal health monitoring and surveillance.

Advice and input has also come from BLM including managers and specialists assigned to the WH&B program, the National WH&B Advisory Board, and WH&B staff in the Washington Office. Advice and input was also provided by the BLM Director's Science Advisory Committee, and from seven topic-specific advisory panels that were convened by the USGS.

8.2 RESEARCH REQUESTS

A National Research Advisory Team exists to review research proposals, monitor research project progress, update the Strategy as necessary, and provide recommendations to the WH&B Division Chief. The Research Advisory Team has been formed with equal participation by the BLM (BLM's National WH&B Research Coordinator), the USGS, and APHIS.

All requests for research and/or research proposals pertaining to the Wild Horse and Burro program, whether generated from the field or through field-related contacts, are to be directed to the Research Advisory Team for review. This Team is also available to assist field offices with the development of research proposals. Proposal format and submission should be coordinated through the National WH&B Research Coordinator. Proposals will be reviewed on an as-needed basis and recommendations for funding will be made directly to the WH&B Division Chief.

8.3 RESEARCH PROJECTS

8.3.1 Fertility Control

An effective, safe, and cost-effective fertility control agent is an essential tool in the management of wild horses. A Fertility Control Field Trial Plan has been developed and field research is underway for two components of the Plan: (1) Individual-Based Trials and (2) Population-Based Trials. Over the last decade, BLM research efforts in fertility control have been focused on PZP (Porcine zona pellucida) and the development of time-release pellets to extend the effectiveness of PZP. PZP has proven effective in reducing foaling rates, the population impacts of which are presently being determined.

8.3.2 Other Possible Fertility Control Tools

Other possible fertility control tools that could potentially be considered in the future include:

- Spaying mares.
- Vasectomizing studs.
- Use of IUDs.
- Use of GonaCon™.
- Use of SpayVac™.
- Use of other fertility control agents or sterilants.

8.3.2.1 Spaying (Mares)

Spaying mares involves major abdominal surgery, is risky, and requires good post-operative care. Spaying mares could be considered in the future if safe, effective and humane surgical methods and post-operative care procedures can be perfected for use on wild horses.

8.3.2.2 Vasectomies (Stallions)

Performing vasectomies on stallions is not a widely practiced procedure within veterinary medicine. Post-vasectomy, it is expected that studs would retain their stud-like behavior. By contrast, gelding studs (castration) is a routine veterinary procedure in both domestic and wild horses. However, geldings lose their stud-like behavior after a few months.

Vasectomized studs would be expected to continue to cover mares and keep them in a harem, but eventually most mares would be bred by an intact stallion. If this continued over several estrous cycles it could lead to extended foaling seasons and potentially an increase in foal mortality. Research shows that at 15-33 percent of foals are sired by non-harem stallions, making it unlikely that fertility control focused on males would be effective in slowing population growth (Bowling and Touchberry 1990, Kaseda and Kahlil 1996, Asa 1999). Further research is needed to perfect a safe technique for performing vasectomies in stallions and demonstrate whether this approach will reduce population growth rates.

8.3.2.3 Use of IUDs

Pilot studies using coil-type intrauterine devices (IUDs) and glass balls or marbles as IUDs have failed to demonstrate a long-lasting effect on conception in mares. In both instances, mares “slipped” the devices and became pregnant soon thereafter. The application of IUDs is further complicated by the difficulties associated with identifying a time window for application when mares are not pregnant.

8.3.2.4 Use of GonaCon™

GonaCon™ is an experimental fertility control vaccine that is being developed for potential use as a management tool for deer. Tests of the GnRH vaccine are ongoing in several States and countries, involving a wide range of wildlife and feral species, including horses. A research study conducted with estray horses in Nevada suggests GonaCon™ will reduce foaling rates for 1 year following treatment. At present, the effectiveness of GonaCon™ as a fertility control agent beyond one year appears similar to or less than that of PZP-22, suggesting limited potential for use of the product to reduce population growth rates over a longer period of time.

8.3.2.5 Use of SpayVac™

SpayVac™ is an experimental fertility control vaccine using PZP antigens and a novel liposome technology. It is easy to handle and administer. A single vaccination with SpayVac™ has maintained a high level of contraception throughout a 4-year study with estray horses in Nevada. However, there is currently no regulatory approval for the management or investigational use of

SpayVac™ through the EPA or FDA, and the product is not currently commercially available. SpayVac™ may have potential for use as an effective, longer-lasting fertility control agent in the future and could offer an alternative to spaying mares. However, additional research would be needed before it could be used on a population-management basis.

8.3.3 Population Estimation and Setting Population Goals

Aerial surveys rarely detect all WH&B within an HMA. As a result, population estimates must be developed using correction factors to account for WH&B not identified during the census. At present, research is being conducted on two techniques (simultaneous double-count and photo mark-resight) that will allow use of such correction factors.

8.3.4 Other Research

In the future, research may be conducted in other areas identified as research priorities, depending on need and funding. When other research needs are identified or research projects are proposed, they will be reviewed and evaluated by the National WH&B Research Advisory Team and recommendations will be made to the WH&B Division Chief.

GLOSSARY OF TERMS

Activity Plan – Examples of activity plans include Herd Management Area Plans (HMAPs) and Allotment Management Plans (AMPs). These plans lead to implementation decisions that usually describe multiple projects or management actions and apply best management practices to make progress toward attainment of Land Use Plan (LUP), Land Health Standards, or other resource objectives.

Adaptive Management – WH&B management is adjusted as indicated based on the results of monitoring and evaluation.

Adult Wild Horse – WH&B 1 year of age and older are considered adults. A foal is considered 1 year of age on January 1 of the year following its birth.

Adult Breeding Population - Wild horses within a population that are 1 year of age and older.

Aerial Survey – A method of counting WH&B using an aircraft. Aerial survey allows the BLM to obtain estimates of WH&B population size with associated confidence intervals.

Animal Unit (AU) - Wild horses 1 year of age and older count as 1 AU and burros 1 year of age and older count as 0.5 AU.

Animal Unit Month (AUM) – The amount of forage (approximately 800 pounds of air dried forage) necessary to sustain one adult horse or two burros for one month.

Appropriate Management Level (AML) - The number of adult horses or burros (expressed as a range with an upper and lower limit) to be managed within an HMA. Forage for WH&B (AUMs) is allocated based on the AML upper limit.

AML Range – The number of adult WH&B within which herd size will be allowed to fluctuate.

AML Upper Limit – The maximum number of WH&B that results in a thriving natural ecological balance (TNEB) and avoids a deterioration of the range. This number should be somewhere below the number that would cause damage to the range (refer to 118 IBLA 75).

AML Lower Limit – The number that allows the population to grow to the AML upper limit over 4-5 years, without the need for gathers to remove excess WH&B in the interim.

Authorized Officer – Any employee of the BLM to whom authority has been delegated to perform the duties described in this Handbook (refer to BLM Manual 1203 for a further explanation of delegation of authority).

Census – A complete count of the total WH&B population within an area. Because aerial surveys do not usually detect all WH&B within an HMA, a true census is usually not possible. Better population estimates are developed using correction factors to account for WH&B not seen during the survey (i.e., sightability correction factors).

Considered Comparably - During the LUP process, WH&B are considered in the same manner as other resource values (e.g., cultural, historic, scenic, rangelands, timber, and minerals).

Emergency – An unexpected event that threatens the health and welfare of a WH&B population and/or its habitat. Examples include fire, insect infestation, disease or other events of a catastrophic and unanticipated nature.

Escalating Problems - Conditions that deteriorate over time. The key indicators are a decline in the amount of forage or water available for WH&B use, with negative impacts to rangeland health and, ultimately, animal condition. Causal factors are normally drought and/or animal numbers in excess of AML. These situations can be detected in advance and are managed through the normal planning process.

Evaluation (LUP Evaluation) – The process of reviewing the land use plan and periodic plan monitoring reports to determine whether the decisions and NEPA analysis are still valid and whether the plan is being implemented.

Evaluation (HMAP Evaluation) – Periodic review of herd management area plans (HMAPs) to determine if the selected management practices were implemented as planned (answers the question “Did we do it?”) and whether or not the plan is effective in making progress toward established habitat and population management objectives (answers the question “Did it work?”).

Excess Animals – Wild, free-roaming horses or burros which have been removed or which must be removed from in order to preserve and maintain a thriving natural ecological balance and multiple-use relationship in an area.

Fertility Control – A tool to decrease fertility and which, when implemented, reduces (slows) population growth rates and extends the gather cycle.

Free-Roaming – WH&B are able to move without restriction by fences or other barriers within a HMA.

Goal – A broad statement of a desired outcome.

Genetic Diversity – The absence of inbreeding depression as monitored through an established baseline and periodic reassessment. This represents an expression of the genetic health of an individual animal or the population.

Herd (Reproducing) – One or more stallions and their mares and foals.

Herd Area (HA) - Geographic areas of the public lands identified as habitat used by WH&B at the time the WFRHBA was enacted (12/15/1971).

Herd Management Area (HMA) – May be established in those HAs within which WH&B can be managed for the long term. HMAs are designated through the LUP process for the

maintenance of WH&B herds. In delineating each HMA, the authorized officer shall consider the appropriate management level (AML) for the herd, the habitat requirements of the animals, the relationships with other uses of the public and adjacent private lands, and the constraints contained in 43 CFR 4710.4.

Herd Management Area Plan (HMAP) – An HMAP establishes management actions and short- and long-term management and monitoring objectives for a specific WH&B herd and its habitat. HMAPs assist the authorized officer in tracking progress toward achieving LUP goals. They are prepared under authority of 43 CFR 4710.3-1. An HMAP can be prepared for an individual HMA or a complex of HMAs.

Implementation Decision – Decisions that make progress or take action toward achieving LUP goals and objectives.

Implementation Plan – Refer to Activity Plan above.

Land Use Plan (LUP) – LUPs provide (by tracts or areas) for the use of public lands. LUPs are prepared in accordance with established land use planning procedures in 43 CFR 1600 and pursuant to FLPMA. They establish goals and objectives (desired outcomes), identify the management actions needed to achieve the desired outcomes, and identify the allowable uses of the public lands.

Manage Principally but not Exclusively – An HMA may be considered for designation as a wild horse or burro range when there is significant public value present, such as unique characteristics in a herd or an outstanding opportunity for public viewing. These HMAs may be managed principally, but not exclusively, for wild horse or burro herds.

Minimal Feasible Level of Management - The minimum number of habitat or population management tools or actions necessary to attain the objectives identified in approved LUPs and HMAPs for a HMA or HMA complex.

Monitoring – The process of collecting and analyzing the data necessary to evaluate existing management and determine whether progress is being made toward attaining established habitat and population management goals and objectives.

Non-Reproducing Wild Horses – An HMA composed, in whole or in part, of sterilized wild horses (either stallions or mares) to aid in controlling on the range population numbers.

Objective(s) – A description of the desired outcome of a management decision. Objectives are specific, measurable, achievable/attainable, reasonable/relevant, and progress can be quantified within established timeframes for achievement (SMART).

Plan Monitoring – The process of tracking land use plan implementation, including collecting and assessing the data or information necessary to evaluate the effectiveness of land use planning decisions.

Population Growth Rates – Represent the net effect of births and deaths in any given year. The BLM reports annual population numbers as of February 28th.

Range – The amount of land necessary to sustain an existing herd or herds of wild free-roaming horses and burros, which does not exceed their known territorial limits.

Resource Management Plan – see LUP above.

Self-Sustaining – The ability of reproducing herds of wild horses and burros to maintain themselves in a healthy condition and to produce healthy foals.

Standards for Land Health – Standards are statements of physical and biological condition or degree of function required for healthy sustainable rangelands. Achieving or making significant progress towards these functions and conditions is required of all uses of public lands. Historical data, when available, should be utilized when assessing standards.

Standard Operating Procedures – The Bureau follows standardized methods of operation which have been developed over time to assure the safe, effective, and humane handling and treatment of WH&B.

Thriving Natural Ecological Balance (TNEB) – WH&B are managed in a manner that assures significant progress is made toward achieving the Land Health Standards for upland vegetation and riparian plant communities, watershed function, and habitat quality for animal populations, as well as other site-specific or landscape-level objectives, including those necessary to protect and manage Threatened, Endangered, and Sensitive Species.

Utilization – The portion of annual forage production that has been consumed by herbivores (WH&B, domestic livestock, wildlife, and insects). The term is also used to refer to the pattern of such use.

WH&B Range – A HMA which meets the special criteria defined in H-1601-1, Land Use Planning Handbook. These include unique herd characteristics, viewing opportunities, unique landscape, significant public demand or other reasons. WH&B Ranges are managed principally, but not necessarily exclusively, for WH&B.

Wild Free-Roaming Horses and Burros – All unbranded and unclaimed horses and burros that use public lands within 10 contiguous Western States as all or part of their habitat, or that have been removed from these lands by the authorized officer, or have been born of wild horses or burros in authorized BLM facilities, but have not lost their status under the WFRHBA (16 USC § 1332 (f)).

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Kaseda, Y., and A.M. Khalil. 1996. Harem size and reproductive success of stallions in Misaki feral horses. *Applied Animal Behaviour Science* 47:163–173.

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APPENDIX 1 - Genetics Data and Hair Sample Collection Instructions

Analysis of DNA to determine genetic diversity of wild horse and burro (WH&B) herds is currently being done using hair samples rather than blood samples. Unless there is a previously recognized concern regarding low genetic diversity in a particular herd, it is not necessary to collect genetic information at every gather. Typical herds should be sampled every other gather. A new baseline does not need to be established through hair analysis if blood analysis has already been completed. Please follow the instructions below for collecting hair samples. Call BLM's National WH&B Research Coordinator if you have any questions.

While it is preferable to sample release horses, you may sample removed horses if necessary. In complexes or HMAs where separate breeding populations are suspected, WH&B in each distinct population should be sampled separately. Do not mix samples from different horses or different breeding populations. The minimum sample size is 25 animals or 25 percent of the post-gather population, not to exceed 100 animals per population. Samples should be collected from males and females in the same approximate ratio as the population. Animals of any age class may be sampled. Burros should be sampled in the same manner as horses.

1. You will need one plain white paper envelope (a white #10 business envelope works best) for each horse. **DO NOT** use plastic or zip-lock bags and **DO NOT** use plastic coated envelopes or envelopes with windows in them.

2. Hair samples must be obtained by pulling the hair out by the root **NOT** cutting or shaving it off the horse. This is because the DNA is in the root follicle not the hair itself. Mane hair will work, but for foals or young horses you may need to obtain tail hair. Please submit about 30 hairs per animal. A bundle of 30 hairs is about the diameter of a pencil.

The easiest way to pull a good sample is to grasp a bundle of hair and wrap it around a clean mane comb or hoof pick. Holding the bundle close to the neck, pull **straight out** firmly. Foal hair is more brittle and tends to break off. If you are having trouble getting hair with the root attached try obtaining a tail hair sample instead.

3. Check that you have the hair roots or hair bulbs attached to the hair at the base. They look, and feel like little bumps on the end of each hair.

Keep the hair in a loose bundle pointed in one direction or twist it together and place it in an envelope. You can cut off excess hair and leave only a few inches with the hair root attached to put in the envelope if that is easier.

4. Seal the envelope and **write the sample number on the envelope.**

Also write the sample number, color, sex and age of the horse on the data collection sheet. If animals cannot be aged in years, at a minimum record adult, yearling or foal. Be sure to keep stray hairs out of the comb and off your clothes so they don't contaminate the next sample.



(James Sturdivant – The Jockey Club, modified with permission)

Please NOTE: it is best to sample when the hair is dry. If you need to sample when it is raining or the horses are wet, then DO use zip-lock bags for each sample AND keep the samples cool not frozen (refrigerate, then ship the samples with cold packs).

Please fill out the top of the form completely, including the HMA name, HMA number and the date the sample was collected.

Within 3 days after hair collection, send a copy of the data collection form to:

Attn: Research Coordinator, National Program Office-Reno

FEDEX the samples, to arrive on a weekday not the weekend with the Data Collection Sheet to Dr. Gus Cothran, address below:

Dr. E. Gus Cothran
VIBS, CVM
TAMU4458
Texas A&M University
College Station, TX 77843
Phone (979) 845-0229

For questions or comments, contact: **National Program Office @ 775-861-6583.**

**HAIR SAMPLE GENETICS DATA COLLECTION SHEET
WILD HORSE AND BURRO HERD GENETICS EVALUATION**

PAGE _____ **OF** _____

HMA: _____ **HMA #:** _____

DATE: _____

TRAP/SUBGROUP: _____

Field Office: _____ **STATE:** _____

BLM CONTACT PERSON: _____

PHONE: _____

ADDRESS:

EMAIL: _____

SAMPLED HORSES WERE (circle) RELEASED or REMOVED

	SAMPLE #	COLOR	SEX	AGE	COMMENTS
1					
2					
3					
4					
5					
6					
7					
8					
9					
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25					

APPENDIX 2 - Habitat Monitoring References

BLM Technical References can be found at <http://www.blm.gov/nstc/library/techref.htm>

A list of references which may be helpful follows:

1. Biological Soil Crusts: Ecology and Management, TR-1730-2, Interagency, 2001.
2. Inventory and Monitoring, Ecological Site Inventory, TR-1737-7, BLM, 2001.
3. Measuring and Monitoring Plant Populations, TR-1730-1, 1998
4. National Range Handbook, Handbook, H-4410-01, 1990.
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6. Rangeland Health Standards, Handbook 4180, BLM, 2001.
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8. Rangeland Monitoring and Evaluation, TR-4400-1, BLM 1988.
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12. Rangeland Monitoring: Analysis, Interpretation, and Evaluation, TR-4400-7, BLM, 1984.
13. Riparian Area Management, Grazing Management for Riparian Areas, TR-1337-4, BLM, 1989.
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18. Riparian Area management, A Guide to Managing, Restoring, and Conserving Springs in the Western Unites States, TR-1737-17, BLM, 2001.

19. Riparian Area Management, Riparian Wetland Soils, TR-1737-19, Interagency, 2003.
20. Statistical Considerations in Rangeland Monitoring. (See TR 4700-8, 1986)
21. Sampling Vegetation Attributes, TR-1734-4, 1996.
22. Utilization Studies and Residual Measurements, TR-1734-3, Interagency, 1996.

APPENDIX 3 - AML Establishment and Adjustment Process

AML decisions determine the number of WH&B to be managed within an HMA or complex of HMAs. AML is expressed as a population range with an upper and lower limit. The AML upper limit is the number of WH&B which results in a TNEB and avoids a deterioration of the range. The AML lower limit is normally set at a number that allows the population to grow to the upper limit over a 4-5 year period, without any interim gathers to remove excess WH&B. See Chapter 4.

A multi-tiered analysis process should be used to establish and adjust the appropriate management level (AML) of WH&B.

- Tier One:** determine whether the four essential habitat components (forage, water, cover and space) are present in sufficient amounts to sustain healthy WH&B populations and healthy rangelands over the long-term.
- Tier Two:** determine the amount of sustainable forage available for WH&B use.
- Tier Three:** determine whether or not the projected WH&B herd size is sufficient to maintain genetically diverse WH&B populations (i.e., avoid inbreeding depression).

Should the Tier One analysis determine that one or more of the essential habitat components is insufficient to maintain a healthy WH&B population and healthy rangelands; the authorized officer should consider amending or revising the LUP to remove the area's designation as an HMA.

Tier 1

Determine if the four essential habitat components (forage, water, cover, and space) are present in sufficient amounts to sustain healthy WH&B populations and healthy rangelands over the long-term. In making this determination, the most limiting factor(s) within the HMA should be considered. In some HMAs, the most limiting factor may be:

- The water available for WH&B use.
- The limited habitat available for WH&B use on either the summer or winter range, in HMAs with seasonal ranges.
- The naturally occurring, low productive capability of the dominant ecological sites.
- The low ecological status of key WH&B use areas.
- Low annual rainfall or extended periods of drought.

The essential habitat components must be located on public lands within the HMA boundary. If forage or water located on private lands within the HMA is needed to maintain healthy WH&B populations, a written agreement with the private landowner allowing use by WH&B is required. In the absence of private landowner agreement, the forage and water on private lands is not available for use by WH&B and may not be included when establishing or adjusting AML.

Forage

The amount of forage available for WH&B use is expressed in animal unit months (AUMs). One AUM is defined as the amount of forage necessary to sustain one adult horse or two adult burros for one month (or approximately 800 pounds of air dry forage). Twelve AUMs of forage are needed to support one wild horse or two adult burros for one year.

As a **starting point**, the amount of sustainable forage available for WH&B use may be determined based on the results of utilization monitoring and use pattern mapping for the years evaluated. A determination of forage availability should not be based on the results of only one year's monitoring data. A minimum of three to five years of monitoring data is preferred. This is because forage production can vary substantially from year to year based on the timing and amount of precipitation received, among other factors. Under the same level of grazing, use pattern mapping may indicate light to moderate utilization during above normal precipitation years, yet indicate heavy or severe utilization during below normal precipitation years.

The nature of the forage (i.e., perennial vs. annual) should also be considered. While annual forage may be available to support WH&B use during years with normal or above normal precipitation, it may be greatly reduced during below average precipitation years. As a result, annual forage is not typically used to support or justify WH&B numbers within a HMA. Within perennial ranges, the production of perennial species may also be greatly reduced during drought, and the production of annual grasses and forbs may be largely absent.

The flexibility to remove WH&B in below average forage years, or to move the animals to another area, can be constrained by funding, contractor capability, facility space, or animal behavior. To prevent range damage or adverse impacts to animal health, the upper limit of AML for WH&B should be established in consideration of the most limiting forage (or water) production years.

Other Considerations

1. Situations in which the Land Health Standards are achieved but population inventory indicates more WH&B are present than expected. These situations may indicate additional forage is present to support use by higher numbers of WH&B, wildlife, or livestock, consistent with LUP guidance.

2. Situations in which deteriorated land health conditions exist but population inventory indicates the number of WH&B is the same or lower than expected. These situations may indicate there is less forage available to support the existing use by WH&B, wildlife, or livestock, and that a reduction in the allowable use may be needed, consistent with LUP guidance.

The number of WH&B which can be sustained based on the available forage is determined in **Tier Two**. To determine if there is sufficient forage to sustain long-term WH&B:

- Analyze utilization data, use pattern mapping, and/or production, ecological site condition (ESI), trend, frequency, precipitation (weather), and indicators of land health.

- Determine the AUMs of actual use by WH&B for each of the evaluation years. (Calculate the AUMs of actual WH&B use based on population estimates derived from aerial surveys. You can also project actual use by WH&B using previous population estimates together with herd's average annual population growth rate.)
- Identify key WH&B use areas (distribution). Calculate carrying capacity on the basis of the key use areas (primary range).

Water

The amount of water available for WH&B use is generally based on public, natural waters (i.e., water occurring on private lands is not considered unless a written agreement with the private landowner is obtained). Water availability during drought conditions is also considered. Sufficient water for WH&B must be available during drought to achieve and maintain a thriving natural ecological balance and multiple use relationship on the public lands.

In determining the amount of water available for WH&B use, a thorough inventory of the available public, natural water resources is needed. Developed and man-made waters should also be inventoried if they are available for WH&B use (i.e., BLM holds the necessary water rights and WH&B access to the water can be depended upon over the long-term). The water resources inventory should include the name, location, and flow (in gallons per minute or cubic feet per second). Wild horses require a minimum of 10 gallons of available water per animal per day (15 gallons per day is not unusual during the hot, dry summer months) while burros require about 5 gallons available per animal per day. The analysis of available water should also be based on the most limiting season of the year (i.e., generally summer when flows are reduced).

Cover and Space

A recurring pattern of WH&B movement out of the HMA to access forage, water, or thermal or hiding cover is an indication the HMA cannot sustain year-long WH&B use. If one or more of the key habitat components is missing, the HMA should be considered as unsuitable for year-long use by WH&B. In these situations, the authorized officer should consider amending or revising the LUP to remove the area's designation as an HMA. An exception would be two or more HMAs which adjoin and are managed as a complex of HMAs, or HMAs which adjoin Forest Service wild horse territories (WHT) that can be managed as a complex.

The results of the **Tier One** analysis may be summarized in a simple table (see example Table 3.1 below). The table should be followed by a detailed description of the analysis and the rationale used in making the determination that a key habitat component either is (or is not) sufficient to support healthy WH&B populations and healthy rangelands over the long-term.

Table 3.1
Sufficient Forage, Water, Cover and Space

HMA	Forage		Water		Cover		Space	
	Sufficient	Insufficient	Sufficient	Insufficient	Sufficient	Insufficient	Sufficient	Insufficient
HMA 1	X			X	X		X	
HMA 2		X		X	X		X	
HMA 3	X			X	X		X	

Tier 2

Determine the AUMs of sustainable forage available for WH&B use. Based on the desired level of utilization, propose an AML for WH&B (expressed as a range with an upper and lower limit).

Forage availability should be determined based on in-depth analysis of rangeland monitoring data. As a first step, monitoring data should be reviewed to determine if Land Health Standards or other site-specific vegetation management objectives are being met. If standards and objectives are being met, WH&B population estimates are then examined to determine the range in number of WH&B using the HMA during the evaluation years. The upper values are used to establish AML when no land health issues occur.

In HMAs where Land Health Standards or other objectives are not being achieved, WH&B use should be examined to determine if this level of use has contributed to or is the causal factor for the standards or objectives not being met (or only partly met). When standards or objectives are not being met and WH&B use is a contributing (or causal) factor, AML is proposed based on the estimated number of WH&B present relative to the level of forage utilization that is occurring (i.e., AML would be established at a number below that which has contributed to the standards or objectives not being met). The need for frequent emergency removals of WH&B due to lack of forage and/or water or the emigration of WH&B out of the HMA due to population size or concentration levels may also be a consideration in proposing AML for WH&B.

The sustainable forage (carrying capacity) available for WH&B use within a HMA is determined pending detailed analysis of utilization data and use pattern mapping for all users. For each evaluation year, determine the following: (1) weighted average utilization, (2) potential carrying capacity, and (3) the proposed carrying capacity. An example for the Mojave Desert ecosystem follows.

***Example – Determining Sustainable Forage Available for WH&B Use
(Mojave Desert Ecosystem)***

The following example can be used to assist with establishing and/or adjusting AML for WH&B use. To determine if there is sufficient forage to sustain long-term WH&B use, analysis of utilization data, use pattern mapping, and/or production, ecological site condition, trend, frequency or other indicators of rangeland health is necessary.

Selection of Allowable Use Criteria

The recommended allowable utilization by all herbivores under year-round use within the Mojave Desert ecosystem is 25-35 percent of the current year's forage production.

WH&B use will be limited to 25 percent of current year's production on key vegetation species as measured at seed dissemination for these species.

Rationale: Within the Mojave Desert ecosystem, allowable use levels of 25 percent are recommended for areas in poor ecological condition or for areas grazed during the growing season. Allowable use levels of 35 percent are recommended for areas in good ecological condition or for areas grazed during the dormant season. Allowable use is established at 25 percent for this HMA due to year-round grazing by WH&B as well as a number of areas in poor ecological condition.

Determine Weighted Average Forage Utilization

Deriving a weighted average utilization from use pattern maps generally provides a more representative picture of the forage use that has occurred throughout the HMA and leads to a more accurate estimate of carrying capacity. To derive a weighted average utilization for the HMA, determine the number of acres within the HMA which received moderate, heavy or severe utilization for each evaluation year.³ Refer to BLM Technical Reference 4400-7 for additional information.

The weighted average use is calculated by multiplying the number of acres by the mid-point of the utilization category (example: moderate use is classified as 41-60 percent, therefore, 50 percent is the mid-point used in the calculation).

Data used in the example carrying capacity analysis outlined below includes: utilization data, use pattern mapping data, actual livestock use information, and WH&B population estimates.

³ To protect rangeland health over the long-term, consider WH&B use only on the primary range when deriving a weighted average utilization. Primary range is defined as the areas which animals (WH&B) prefer to use when management is limited (refer to Glossary of Terms Used in Range Management, 4th Edition, Published by Society for Range Management, 1998). Secondary range is defined as range which is not ordinarily used until the primary range has been overused. Therefore, areas receiving slight or light use or that are unused should not be considered when deriving a weighted average utilization.

Weighted Average Utilization =

(Moderate use acres*50 percent) + (Heavy use acres*70 percent) + (Severe use acres*90 percent)

Analyze the total acres of moderate, heavy, and severe use.

1995	$\frac{(19639*50 \text{ percent}) + (34351*70 \text{ percent})}{53,990}$	= 63 percent
1996	$\frac{(8023*50 \text{ percent}) + (48957*70 \text{ percent}) + (9885*90 \text{ percent})}{66,865}$	= 71 percent
1997	$\frac{(3081*50 \text{ percent}) + (22888*70 \text{ percent})}{25,969}$	= 68 percent
1999	$\frac{(5627*50 \text{ percent}) + (3696*70 \text{ percent})}{9,323}$	= 58 percent
2000	$\frac{(4344*50 \text{ percent}) + (4386*70 \text{ percent})}{8,730}$	= 60 percent
2002	$\frac{(5627*50 \text{ percent}) + (3696*70 \text{ percent})}{9,323}$	= 58 percent
2004	$\frac{(4395*50 \text{ percent}) + (7933*70 \text{ percent})}{12,328}$	= 63 percent

The example below demonstrates the impact of variable precipitation (and forage production) on actual forage utilization and the desired carrying capacity.

Potential Carrying Capacity =

$$\frac{\text{Average use in AUMs (of cattle or horse use)*25 percent Allowable Use Objective}}{\text{Weighted Average Utilization}}$$

<u>Year</u>	<u>Average Use (AUMs)</u>	<u>Effective</u>	<u>Precipitation</u>
1995	$\frac{3000 \text{ AUMs} * 25 \text{ percent}}{63 \text{ percent}}$	= 1190 AUMs	Above Average
1996	$\frac{600 \text{ AUMs} * 25 \text{ percent}}{71 \text{ percent}}$	= 211 AUMs	Severe Drought
1997	$\frac{444 \text{ AUMs} * 25 \text{ percent}}{68 \text{ percent}}$	= 163 AUMs	Severe Drought
1999	$\frac{600 \text{ AUMs} * 25 \text{ percent}}{58 \text{ percent}}$	= 259 AUMs	Severe Drought
2000	$\frac{1440 \text{ AUMs} * 25 \text{ percent}}{60 \text{ percent}}$	= 600 AUMs	Slightly Below Average
2002	$\frac{1632 \text{ AUMs} * 25 \text{ percent}}{58 \text{ percent}}$	= 703 AUMs	Average
2004	$\frac{3576 \text{ AUMs} * 25 \text{ percent}}{63 \text{ percent}}$	= 1419 AUMs	Well Above Average

Proposed Carrying Capacity =

In the example above, the carrying capacity would be set in consideration of the driest years in order to prevent damage to the range or adverse impacts to animal health.

$$\frac{211 (1996) + 163 (1997) + 259 (1999) + 600 (2000) + 703 \text{ AUMs} (2002)}{5 (\# \text{ years of data})} = 387 \text{ AUMs}$$

Proposed AML =

$$\frac{387 \text{ AUMs (Desired Carrying Capacity)}}{12 \text{ months}} = 32 \text{ cattle or wild horses}$$

Or:

$$\frac{387 \text{ AUMs (Desired Carrying Capacity)}}{6 \text{ months}} = 65 \text{ burros}$$

Discussion:

- Allocation of the forage between WH&B, wildlife and domestic livestock would be made after site-specific NEPA analysis is completed.
- In the example above, the upper limit of the AML range for wild horses was calculated by dividing the proposed carrying capacity for the HMA (expressed in AUMs) by 12 months.
- The upper limit of the AML range for burros was calculated by dividing the proposed carrying capacity for the HMA by 6 months (an adult burro is equivalent to only 0.5 AU).
- The lower limit of the AML range would be determined based on the herd's average annual growth rate (i.e., the lower limit will normally be set at a number that allows the herd to grow to the upper limit over a 4-5 year period without the need for gathers to remove excess WH&B in the interim).

Tier 3

Determine whether or not the WH&B herd size proposed in Tier Two is sufficient to maintain genetically diverse WH&B populations (i.e., avoid inbreeding depression). To avoid inbreeding depression in wild horse populations, a minimum herd size of 50 effective breeding animals (a total population size of about 150-200 animals) is recommended. An effective breeding size for burro herds has not yet been determined.

If the herd size proposed in Tier Two is not sufficient to maintain genetically diverse WH&B populations, determine if there is WH&B interchange between the HMA and other adjacent HMAs or WHTs and whether this interchange would be sufficient to maintain genetic diversity (avoid inbreeding depression). Genetic diversity baseline or monitoring information can be used to evaluate whether WH&B interchange between HMAs is occurring.

If the proposed herd size is less than 150 animals and the HMA is isolated with limited potential for WH&B egress/ingress, possible management actions which could be considered as part of an appropriate site-specific NEPA analysis could include:

1. Removing the area's designation as an HMA through LUP and returning it to HA status.
2. Maximizing the number of breeding age WH&B in the herd (animals age 6-10 years).
3. Adjusting the sex ratio to favor males to encourage formation of additional breeding harems.
4. Introducing 1-2 young mares from outside the HMA every generation (about every 10 years). Introduced animals should come from herds living in similar environmental conditions.

Documentation

The results of the multi-tiered analysis should be documented in an HMA (AML) Evaluation Report. The completed report should be provided to the affected and interested public for a 30-day review and comment period (e.g., public scoping). The management evaluation report is not a decision subject to administrative appeal. However, once the decision is made, the Evaluation Report is part of the administrative record for that decision.

Following public scoping, a site-specific environmental analysis should be completed to analyze the environmental impacts associated with the Proposed AML and any alternatives. As part of the environmental analysis, summarize the results of public scoping and document how BLM used the comments in preparing the environmental assessment (or EIS).

Based on the analysis of potential environmental impacts, the authorized officer will determine whether to prepare an Environmental Impact Statement (EIS) or issue a Decision Record and Finding of No Significant Impact (FONSI). A FONSI documents why implementation of the selected AML will not result in environmental impacts that significantly affect the quality of the human environment. Or, if an EIS has been prepared, the authorized officer's decision will be documented in a Record of Decision.

Administrative Review

AML decisions are subject to administrative review (appeal) pursuant to 43 CFR Part 4.

APPENDIX 4 - Herd Management Area Planning

Herd management area plans (HMAPs) establish the management actions and the short and long-term management and monitoring objectives for WH&B herds and their habitat. Once established with public involvement through site-specific NEPA analysis and decision, the objectives guide management of the HMA or complex over the life of the plan.

Management Evaluation

Typically, the first step in the HMAP analysis process should be to evaluate existing management. The existing vs. the desired condition of the both the herd and its habitat are examined during the evaluation. Refer to Figures 4.1 and 4.2.

Figure 4.1
Habitat Management Evaluation

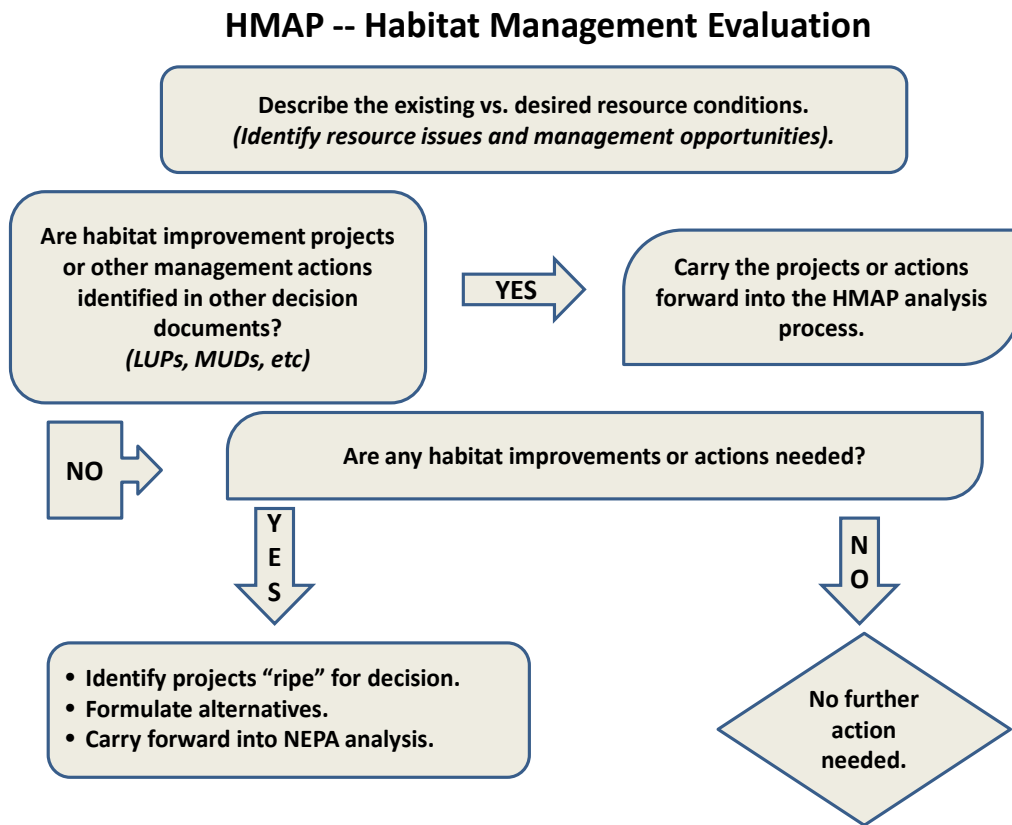
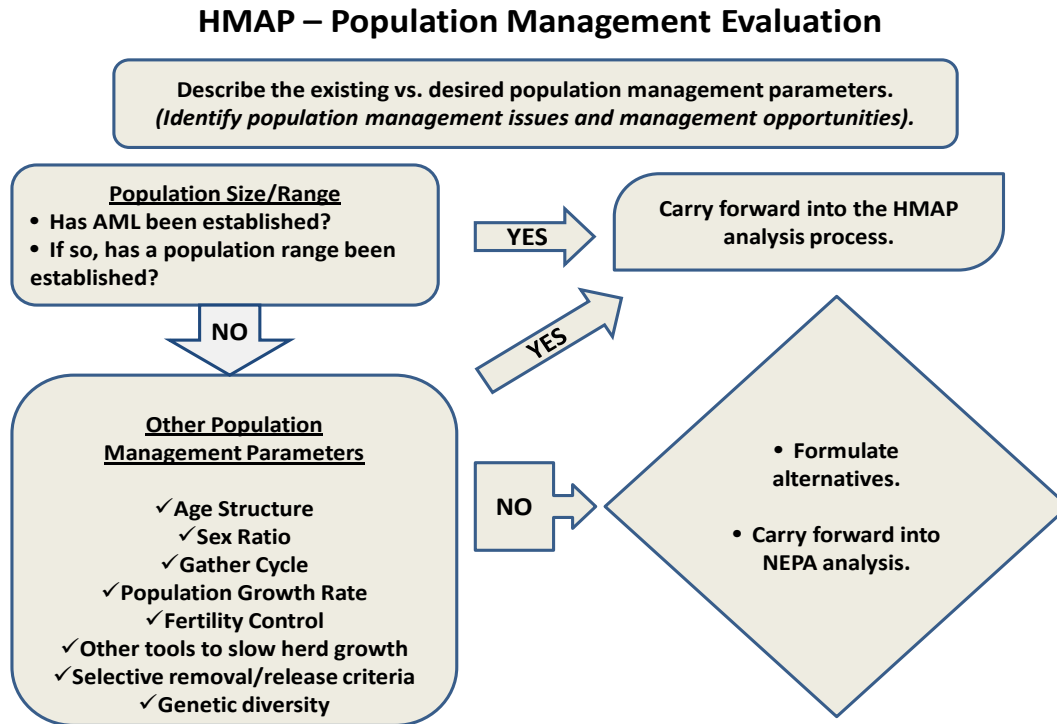


Figure 4.2
Population Management Evaluation



At the conclusion of the management evaluation, a report is prepared and provided to the public for a 30-day review and comment period (public scoping). The management evaluation report is not a decision subject to administrative appeal. Rather, the report documents the key issues identified as a result of the management evaluation. A range of the possible management alternatives (Proposed Action and Alternatives) which could address/resolve the identified issues may also be identified.

NEPA Analysis and Decision

The next step in the HMAP analysis process would be to analyze the potential environmental consequences which could result from implementation of the Proposed Action or Alternatives through completion of a site-specific environmental analysis (NEPA).

To prepare a concise environmental assessment (EA), site-specific management, monitoring and implementation objectives can be displayed in a tabular format within the environmental assessment. Refer to the example which follows.

Example – Documentation of the No Action Alternative in the HMAP EA

Alternative One: No Action Alternative, Continue Existing Management

Under Alternative 1 (No Action), the HMA would continue to be managed as a range of 150-250 wild horses as follows:

- The sex ratio of the animals released back to the range following future gathers would be about 34 percent males and 64 percent females.
- Existing monitoring, including utilization, forage condition, water availability, animal health and periodic population estimates and sampling for genetic diversity (inbreeding) would occur.
- AML would be adjusted, as needed, based on in-depth analysis of resource monitoring data.
- Fertility control would be applied to mares released back to the range following future gathers.

Table 4.1
No Action Alternative (Continue Existing Management) in HMAP Format

Management Objective(s)	Monitoring Objective(s)	Implementation Objective(s)
<p>A. <u>Control Population Numbers</u> Manage the wild horse population within the established AML range to protect the range from the deterioration associated with overpopulation.</p>	<p>Aerially estimate populations a minimum of once every 3-4 years.</p> <p>Determine population number and average annual herd growth rate.</p>	<p>Schedule gathers to remove excess wild horses when (1) the population reaches or exceeds the AML upper limit (about every 3 years), or (2) when forage utilization exceeds 50 percent of current year's growth in ½-2/3 of the key areas; or (3) when animal health/condition is at risk.</p>
<p>B. <u>Assure Land Health</u> Limit utilization by all herbivores to 50 percent of the current year's above ground primary production for key grasses and 45 percent for key shrubs and forbs.</p>	<ul style="list-style-type: none"> • Locate key monitoring areas within the HMA. • Establish baseline trend studies using the frequency sampling procedures outlined in the (cite applicable BLM Technical Reference or Handbook). • Measure utilization at key areas and complete use pattern mapping annually. 	<p>Re-adjust AML or identify management actions to address resolve land health issues, as needed/appropriate, based on results of land health monitoring.</p>

Based on the analysis of potential environmental consequences, the authorized officer will determine whether to prepare an EIS or issue a Decision Record and FONSI.

HMAP

As a final step and to facilitate on-the-ground implementation, the selected management strategy (selected alternative), together with the habitat and population management, monitoring and implementation objectives are documented in HMAP format. The HMAP is included as an attachment to the authorized officer's final decision.

HMAP Format

- 1. Introduction.** Briefly summarize the relevant background information.
- 2. Selected Management Alternative.** Briefly summarize the selected management strategy/alternative as outlined in the EA, together with the site-specific habitat and population management objectives and management actions.
- 3. Monitoring and Evaluation Plan.**
- 4. Project Tracking and Implementation Schedule.**

The Monitoring Plan and Tracking Log/Project Implementation Schedule may also be prepared in a tabular format. See the examples which follow.

Table 4.2
Example -- Monitoring Plan

Item	How	Who	When	Actions to Take (Adaptive Management)
Population Management Monitoring				
Manage wild horse populations within the established AML range.	Aerial survey flights following established protocols. Simultaneous double count method or other approved protocol pending population estimation research results & recommendation.	FO WH&B Specialist	Aerial population estimates a minimum of every 3 years, i.e., 2010, 2013, etc.	Schedule gathers to remove excess wild horses when (1) the population reaches or exceeds the AML upper limit (about every 3 years), or (2) when forage utilization exceeds 50 percent of current year's growth in ½-2/3 of the key areas; or (3) when animal health/condition is at risk.
Habitat Management Monitoring				
Limit utilization by all herbivores to 50 percent of the current year's above ground primary production for key grasses and 45 percent for key shrubs and forbs.	Measure utilization at key areas and complete use pattern mapping annually.	FO WH&B Specialist	Annually (October)	Re-adjust AML or identify management actions to address resolve rangeland health issues, as needed/appropriate, based on results of rangeland health monitoring.

Table 4.3

Example – Tracking Log/Project Implementation Schedule

Description	Who	Where	When	Completed	Remarks
Population Management Actions					
Schedule gathers to remove excess wild horses when the population reaches/exceeds AML, utilization exceeds allowable limits, or animal health/condition is at risk.	BLM	(Name) HMA	About every 3 years (2010, 2013, etc)		
Habitat Management Actions					
Reconstruct Cactus Spring water development.	Friends of Spring Snails	T. 44 N., R 12 W, SE,SE Section 2	2009	2010	RIP No. XXXXXX