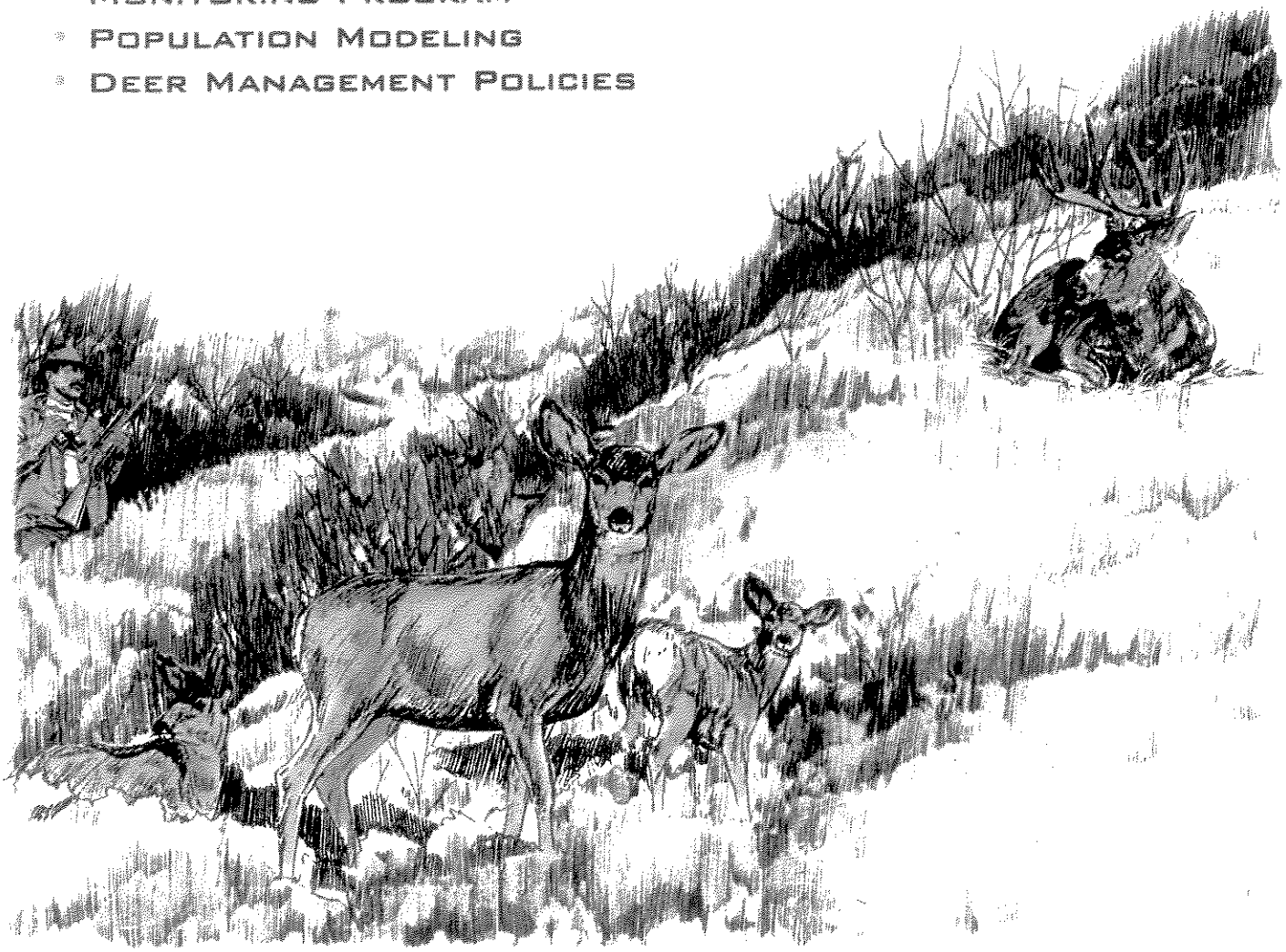
Adaptive Harvest Management

- Mule Deer Population Objectives
- Hunting Regulation Strategies
- Special Management districts
- Monitoring Program
- Population Modeling
- Deer Management Policies



Montana Fish, Wildlife & Parks

January 15, 2001

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OVERVIEW

Montana's Deer Management Program is based upon the integration of the following elements:

1) Habitat Protection and Enhancement
2) Population Surveys
3) Harvest Management
4) Access Management
5) Research
6) Information & Education
7) Enforcement of Hunting Regulations
8) Minimization of Game Damage Complaints from Private Landowners
9) Hunter and Public Preferences and Attitudes

The establishment of hunting regulations is but one aspect of harvest management within the overall deer management program. To address this aspect, FWP is initiating a process to incorporate Adaptive Harvest Management (AHM) concepts into the hunting regulation setting process.

Improvements in the overall program have been and are currently being made to address issues associated with the other elements. Habitat Montana (HB 526, adopted by the 50th Legislature) was adopted (ARM 12.9.508 - 12.9.512) by the Fish, Wildlife & Parks Commission. The program has resulted in protection and enhancement of 176,000 acres of important habitat for Montana wildlife including deer. The Upland Game Bird Habitat Enhancement Program has also had significant benefits to deer by providing incentives to landowners to use appropriate seed mixes when participating in the Conservation Reserve Program, establishing shelter belts, and implementing rest rotation grazing systems. The Block Management Program was recently improved through the addition of hunter enhancement measures that increased private landowner incentives for hunter access to private lands. In addition, FWP wildlife biologists provide wildlife-related technical assistance to private landowners and public land managers concerning habitat improvement projects, grazing systems, prescribed fire, and subdivision planning.

There are four major components in the Adaptive Harvest Management system: population objectives, monitoring program, hunting regulation alternatives, and modeling. The first and foremost element is the establishment of population objectives. These objectives must be measurable via a strong monitoring program, the second component. The third element of the process is to select hunting regulation alternatives which can be implemented when the monitoring program detects significant change in population status. The fourth component is modeling the dynamics of mule deer populations which can be used to predict future trends in numbers. The results of previous research in Montana, which was implemented in the mid 1970s at a time of low deer numbers similar to trends observed in the mid 1990s, would

suggest that the most influential factors in deer population dynamics are weather, habitat condition, predation and other natural mortality, and hunter harvest.

The following information describes how FWP proposes to define deer population objectives, monitor population status, and recommend alternative hunting regulations to the Fish, Wildlife & Parks Commission. Models that incorporate hunter harvest, weather, habitat, and natural mortality are now being used to complete the implementation of all elements of Adaptive Harvest Management.

FWP considers this to be a dynamic document. One of the benefits of Adaptive Harvest Management is learning as you go. As information is gathered through the monitoring program, there may be a need to adjust population parameters, monitoring locations and guidelines. In addition, adjustments or modifications in the suite of hunting regulations may be necessary as we learn more about the results of various harvest rates.

INTRODUCTION

The FWP Commission adopted a Deer Management Policy (Appendix I) on February 6, 1998, to serve as a basis for establishment of deer hunting regulations including season frameworks and license quotas. This policy provides direction to the department for developing the deer population objectives and hunting regulations used in AHM. The Commission has full authority under MCA 87-1-301 to determine the final hunting regulations established each year. FWP proposes to define deer population objectives for ecological types or groups of hunting districts that will be known as Population Management Units (PMUs). Each PMU has unique population indicators and a corresponding monitoring program. Long-term research studies conducted in Montana have produced descriptions of the dynamics of deer populations in open, complex ecological systems. These studies were conducted at several locations across the diverse spectrum of environments that mule deer and white-tailed deer occupy in Montana. Descriptions from these studies and the observations and analyses conducted by regional management biologists form the basis for delineating the various PMUs.

The parameters of vital importance to managing deer populations are trends in population size, fawn recruitment, natural mortality of fawns and adults, hunter harvest rates and age structure. The degree of fluctuation in these parameters varies among the five PMUs. These parameters which determine population status will be monitored at representative census and trend areas (see Monitoring Program) and thus help to define the population objectives for each PMU. Data collected on these survey areas will include buck:doe and fawn:doe ratios in the post-hunting season and total count and fawn:adult ratios during spring. Additional information used to monitor bucks will consist of age, number of antler points, and antler size of bucks as determined from hunter checking stations, harvest statistics, and tooth cementum analysis. Annual evaluations of the population parameters and harvest information will be conducted for each monitoring location. It is not feasible to conduct aerial surveys of mule deer populations in each and every hunting district. However, the 13 aerial census areas and 67 aerial trend

areas are representative of nearly all environments occupied by mule deer statewide. Hunting districts that are not surveyed are grouped with the nearest adjacent trend or census area occupying a similar environment.

Hunting regulations will be recommended annually by FWP to the FWP Commission based upon the current status of populations in relation to the established objectives. Recommended hunting regulations will reflect the desired harvest rate and the preferences and concerns of sportsmen and landowners. Comments from recent bio-economic, hunter attitude, and preference surveys, as well as those made during season setting meetings, are used to gauge these preferences and concerns.

Objectives and hunting regulations listed for each PMU are largely determined by characteristics of the population and the potential for hunter harvest. Also, land access and habitat security are important concerns in harvest management. The weather during the hunting season can also significantly influence hunter success. More conservative hunting seasons are usually associated with areas providing plentiful public access and low habitat security. As these factors change, modifications to hunting seasons and/or objectives may become necessary.

The remainder of this document defines the population management units, population indicators, and the hunting regulations that will be recommended based on population status. As stated in the overview, AHM is only a portion of the overall deer management program. This program is continually being developed and modified by FWP with the assistance and cooperation of hunters, private landowners, public land managers, and other interested members of the public.

DEER MANAGEMENT GOAL

Manage for the long-term welfare of Montana's deer resource and provide recreational opportunities that reflect the dynamic nature of deer populations.

The goal provides direction in development of deer management objectives and regulatory alternatives. Management decisions will be based on the welfare of the deer resource first, and recreational opportunities will be provided consistent with the dynamic nature of deer populations.

MULE DEER

Five population management units have been identified within the state based upon mule deer population dynamics and habitat characteristics (Fig. 1). Population indicators have been established in each unit to define the objectives (Table 1). Regulations (standard, restrictive, and liberal) are identified for each unit which will guide department hunting season recommendations to the Fish, Wildlife & Parks Commission (Table 2). The information

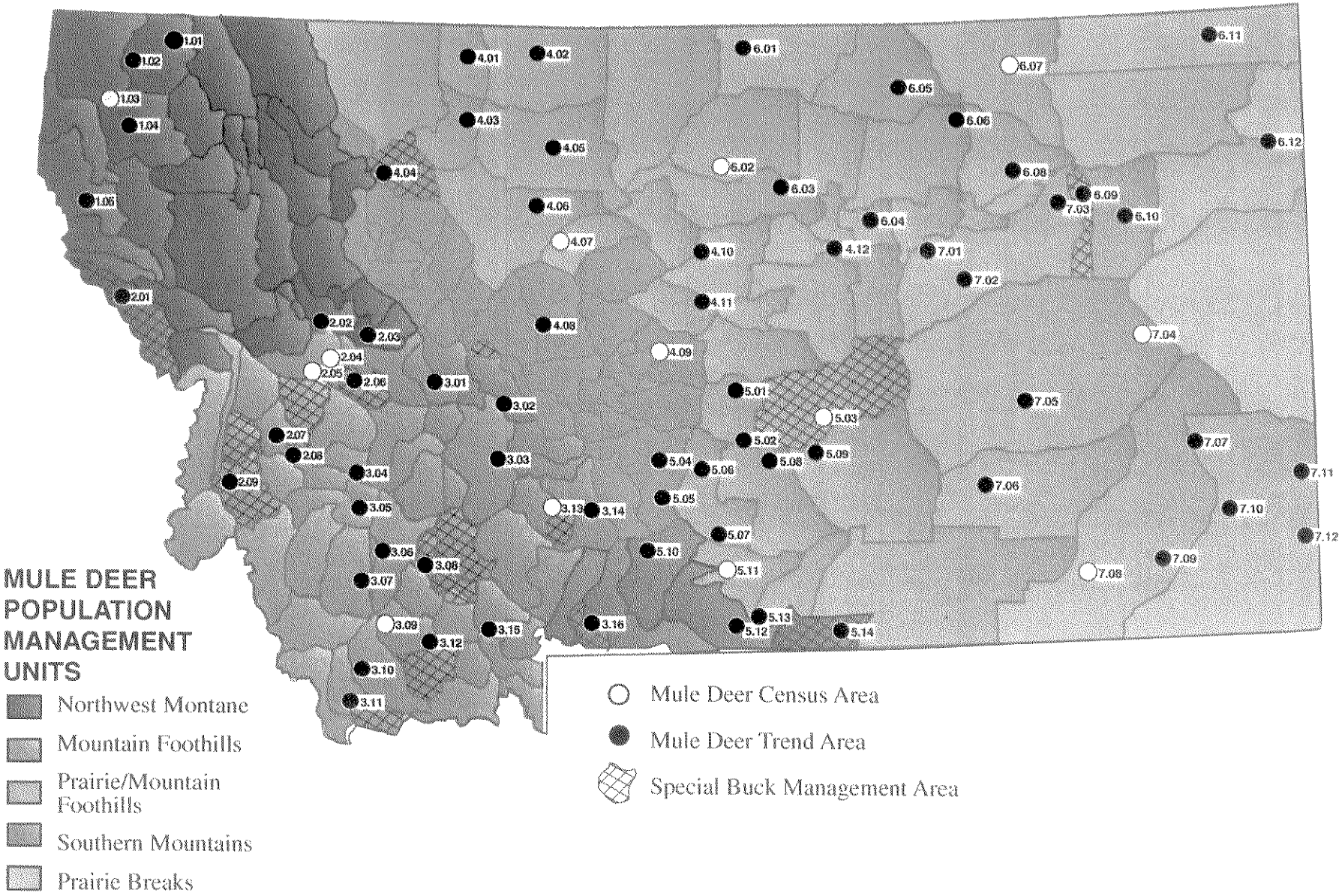

Figure 1. Location of mule deer census and trend areas within the five population management units.

Table 1. Indicators of mule deer population status and corresponding regulation categories.

NORTHWEST MONTANE	Yearling Buck Harvest	Recruitment Fawns:100 Adults	Total Buck Harvest	Other Comments
Standard	±25% of long-term average	Greater than 30	±25% of long-term average	Unlimited buck permits recommended if harvest of 4 pts or greater is less than 25% or buck:doe ratio is less than 10:100 for 2 consecutive years
Restrictive	At least 25% below long-term average	Less than 30	At least 25% below long-term average	Unlimited buck permits recommended if harvest of 4 pts or greater is less than 25% or buck:doe ratio is less than 10:100 for 2 consecutive years
Liberal	More than 25% above long-term average	Greater than 30	More than 25% above long-term average	Unlimited buck permits recommended if harvest of 4 pts or greater is less than 25% or buck:doe ratio is less than 10:100 for 2 consecutive years

Table 1 Continued.

MOUNTAIN FOOTHILL	No. Deer Counted on Survey Area	Recruitment Fawns:100 adults	Buck Harvest*	Other Comments
Standard	±25% of long-term average	Between 20 and 40	±25% of long-term average	If less than 10 bucks:100 does following 2 years of more than 40 fawns:100 adults, then unlimited buck permits
Restrictive	At least 25% below long-term average	Less than 20	At least 25% below long-term average	If less than 10 bucks:100 does following 2 years of more than 40 fawns:100 adults, then unlimited buck permits
Liberal	More than 25% above long-term average	Greater than 40	More than 25% above long-term average	If less than 10 bucks:100 does following 2 years of more than 40 fawns:100 adults, then unlimited buck permits

PRAIRIE/ MOUNTAIN FOOTHILL	No. Deer Counted on Survey Area	Recruitment Fawns:100 Adults	Buck Harvest*
Standard	±25% of long-term average	Between 30 and 45	±25% of long-term average
Restrictive	At least 25% below long-term average	Less than 30	At least 25% below long-term average
Liberal	More than 25% above long-term average	Greater than 45	More than 25% above long-term average

Table 1 Continued.

SOUTHERN MOUNTAINS	No. Deer Counted on Survey Area	Recruitment Fawns:100 Adults	Buck Harvest*
Standard	±30% of long-term average	Between 30 and 45	±25% of long-term average
Restrictive	At least 30% below long-term average	Less than 30	At least 25% below long-term average
Liberal	More than 30% above long-term average	Greater than 45	More than 25% above long-term average

PRAIRIE/BREAKS	No. Deer Counted on Survey Area	Recruitment Fawns:100 adults	Buck Harvest*
Standard	Between 20% above and 30% below the long-term average	Between 30 and 60	±25% of long-term average
Restrictive	At least 30% below long-term average	Less than 30	At least 25% below long-term average
Liberal	More than 20% above long-term average	Greater than 60	More than 25% above long-term average

*Harvest trends are used in the absence of long-term aerial survey data

Table 2. Mule deer hunting regulations for each of five population management units.

Population Management Unit	Hunting Regulation Type	Standard Hunting Regulation	Restrictive Hunting Regulation	Liberal Hunting Regulation
Northwest Montane	General Season	5 week AB – Unless harvest of 4 pt or greater bucks is less than 25% or buck:doe ratio is less than 10:100 for 2 consecutive years, then unlimited buck permits	5 week AB – Unless harvest of 4 pt or greater bucks is less than 25% or buck:doe ratio is less than 10:100 for 2 consecutive years, then unlimited buck permits	5 week (first ES, last 4 AB) – Unless harvest of 4 pt or greater bucks is less than 25% or buck:doe ratio is less than 10:100 for 2 consecutive years, then unlimited buck permits
	Antlerless B Licenses	Low-moderate numbers by HD	Limited number for game damage problems	Moderate-high numbers by HD
	Archery	6 week AB	6 week AB	6 week ES
Mtn/Foothill	General Season	5 week AB – Unless buck:doe ratio is less than 10:100 following 2 consecutive years of greater than 40 fawns:100 adults, then unlimited buck permits	5 week AB – Unless buck:doe ratio is less than 10:100 following 2 consecutive years of greater than 40 fawns:100 adults, then unlimited buck permits	5 week (first 2 ES and last 3 AB) – Unless buck:doe ratio is less than 10:100 following 2 consecutive years of greater than 40 fawns:100 adults, then unlimited buck permits
	Antlerless B Licenses	Low-moderate numbers by HD	Limited number for game damage problems	Moderate-high numbers by HD
	Archery	6 week ES	6 week AB	6 week ES
Prairie/Mtn Foothill	General Season	5 week ES	5 week AB	5 week ES
	Antlerless B Licenses	None-moderate numbers by HD	Limited number for game damage problems	Liberal numbers by HD – Multiple B option
	Archery	6 week ES	6 week AB	6 week ES
Southern Mtns	General Season	5 week AB	5 week AB	5 week (first ES and last 4 AB)
	Antlerless B Licenses	None-low number by HD	Limited number for game damage problems	Moderate-liberal number by HD
	Archery	6 week ES	6 week AB	6 week ES
Prairie/Breaks	General Season	5 week ES	5 week AB	5 week ES
	Antlerless B Licenses	None-moderate numbers (Not more than 50% of liberal quota)	Limited number for game damage problems	Liberal numbers – option for licenses thru drawing or multiple OTC by HD, portion of HD or groups of HDs
	Archery	6 week ES	6 week AB	6 week ES

ES (Either Sex)
AB (Antlered Buck)
4 pt (Four Point Buck)
Multiple B (More than one per hunter)

OTC = Over-the-counter B licenses
HD (Hunting Districts)

collected from each population monitoring location will be used to place the population at a given status level as determined by the population indicators. These indicators, along with other pertinent information from check stations, statewide harvest statistics, and input from sportspersons and landowners will determine which hunting regulations are recommended.

Population status may change significantly in a short period of time due to the dynamic nature of mule deer populations. Populations occasionally experience rapid declines and, likewise, can increase to peak numbers in short periods of time. To enhance management responsiveness, it may be necessary in the case of a rapid decline to implement a restrictive regulation immediately following a liberal hunting season. In the case of a rapid increase, a liberal regulation may follow a restrictive hunting season rather than progressing through the standard regulation. The population indicators and public input will dictate the optimum regulation.

The purpose of the hunting season is described for each regulation (standard, restrictive, or liberal). A specific hunting season type may be liberal in one area and considered restrictive or standard in another. This results from the different deer population characteristics associated with the environment of the area and the security provided to deer by the terrain and vegetation, land designations (adjacent preserves, wilderness, etc.) and road access. Each regulation includes a description of the general hunting season, availability of antlerless B licenses, solutions to game damage complaints, and a description of the archery season.

The prescribed standard, liberal, and restrictive types are recommendations only, and the FWP Commission has the full authority to set seasons which may differ from these recommendations. The Commission has the authority to set a more restrictive season or order a season closure where monitoring data indicate very low population levels.

The majority of hunting districts have seasons designed to provide maximum hunting opportunity and harvest of mule deer consistent with the long-term welfare of the deer resource. In most cases, this is a standard five-week season for either sex or antlered bucks ending the Sunday after Thanksgiving. Where buck:doe ratios are below objectives, a five-week season combined with unlimited or limited permits is preferred. Other season types may be continued where already in place or implemented where special circumstances make alternative season types viable.

Sixteen of the 159 hunting districts (10%) have been selected as special management areas. These districts will be managed under very restrictive hunting regulations designed to significantly limit antlered buck harvest. Special management districts have been established to provide the opportunity for a limited number of people to harvest an older aged buck where public access is good. Population indicators and regulations specific to each of these hunting districts have been established. A detailed description of the criteria utilized to select these districts and the rationale for this approach is included in the section titled Mule Deer Special Management Districts (see p. 30).

Weather conditions and timing of aerial surveys can dramatically affect their usefulness in assessing population status. Interpretation of survey information will thus remain an integral step in the monitoring process. To ensure consistency in methods of data collection, monitoring guidelines have been established (see p. 40).

NORTHWEST MONTANE:

Description: Hunting Districts: 100, 101, 102, 103, 104, 110, 120, 121, 122, 123, 124, 130, 132, 140, 141, 150, 151, 170, 200, 201, 202, 203, 280, 281, 282, 283, 284, and 285. Of these, hunting district 202 is a special management district (see page 31). This population management unit encompasses 14,659 square miles including all of Region 1 and the northern tier of hunting districts in Region 2.

Topography varies from rugged, mountainous terrain along the Continental Divide, including the Flathead, Swan, and Mission ranges to more gentle, smaller ranges such as the Salish Mts. and Nine Mile Divide. Elevations as low as 2000 feet occur in the northwestern portion of the unit near Troy to over 9000 feet in the highest peaks of the Mission Mts. Climate is strongly influenced by the maritime effect of moisture-laden air from the Pacific Ocean. Precipitation generally decreases from west to east with average annual precipitation at most valley locations varying between 20 and 32 inches, more than half falling as snow during winter. Vegetation is characterized by the greatest continuous cover of coniferous forest of any population management unit in the state. Forest cover extends across most valley bottoms with natural openings limited in size and distribution. Overstory species that occur at lower elevations include ponderosa pine, Douglas fir, and western larch. At higher elevations, dominant species include lodgepole pine, Engelmann spruce, and subalpine fir. Relic stands of western red cedar, grand fir, western white pine, and western hemlock are confined to moist microsites. Plant communities in the understory are represented by a diversity of species such as pine grass, beargrass, Oregon grape, spirea, huckleberry, twinflower, queencup beadlily, and arnica. Timber-related industries, tourism, mining, and agriculture are important land uses. Public land accounts for nearly 75% of this population management unit although large parcels are privately owned by timber corporations. Non-corporate private land consists of small parcels confined to major river valleys.

Mule deer were apparently abundant and well distributed following stand replacement fires in the early 1900s. As forest cover increased as a result of improved fire suppression and old burns became revegetated with conifers, mule deer populations generally declined in abundance and distribution over the last 50 years.

Dense forests preclude efficient aerial surveys for mule deer except in a few locations. Population status information is generally limited to trends in harvest gathered from check stations or the statewide harvest survey. Aerial surveys provide the primary data on trends in fawn:100 adult ratios. This information indicates that mule deer densities today are generally low across broad expanses of northwest montane forest. However, high density populations may occur on rugged ridge systems and alpine peaks adjacent to conifer forests in summer and fall and spend winter at lower elevations within the montane forest. On dry sites, mule deer distribution may extend to valley bottoms.

Harvest trends indicate that populations of mule deer in the northwest montane may fluctuate less than other population management units. Weather conditions during hunting seasons strongly influence the availability of mule deer to hunters. Populations that occupy rugged, roadless terrain may occasionally experience high rates of buck harvest when deer are forced to lower elevations by deep snow. Low to average snow depths during other years result in moderate harvest rates that tend to restore numbers of older bucks. Typically, 30-60% of bucks harvested annually in these populations have antlers with four or more points. Game damage complaints related to mule deer are infrequent in this population management unit.

Hunting districts 150, 151, and 280 include designated wilderness or roadless backcountry. Deer hunting in these districts is limited by the difficulty of access and because most hunters focus on elk. Mule deer populations migrate to winter ranges in adjacent hunting districts outside the wilderness and are influenced by regulations in those districts.

Objective: Maintain the population within 25% of the long-term average (at least 10 years) as measured by the total number of bucks harvested or the total number of deer observed during spring on areas where aerial surveys are feasible.

STANDARD HUNTING REGULATION

PURPOSE: The **Standard Hunting Regulation** is implemented during those years when the population size is near the long-term average and recruitment is moderate to high. It allows antlerless B licenses to provide additional hunting opportunity commensurate with increasing or stable deer populations.

A **Standard Hunting Regulation** will be recommended if:

1) a) Recruitment is greater than 30 fawns:100 adults as determined from aerial surveys; **AND,**
   b) The proportion of the buck harvest comprised of yearlings is within 25% of the long-term average as determined from hunter check stations where available; **AND,**
2) a) The total buck harvest (most recent 3 year average)in the northwest montane as determined by the statewide harvest survey is within 25% of the long-term average,
   b) **OR** where aerial surveys can be conducted, the total number of deer counted during spring on survey areas is within 25% of the long-term average,
3) If less than 25% of the buck harvest monitored at check stations and/or the statewide harvest survey is 4-point or greater (including brow tines) for two consecutive years, or where adequate samples of mule deer can be classified post-season and buck:doe ratios are less than 10:100 following two consecutive

years of fawn recruitment greater than 30 fawns:100 adults, then unlimited permits for bucks will be recommended.

Hunting Season (except HDs 150, 151, & 280):

1) Five weeks antlered buck. Unlimited permits for bucks will be recommended if parameter 3 (as defined above) is applicable. A permit will be guaranteed to all applicants. However, the permit will limit that person to hunt mule deer bucks in only the hunting district selected. If objectives are not met with unlimited buck permits after three consecutive hunting seasons, then a quota on buck permits will be recommended.
2) Low-moderate numbers of antlerless B licenses may be issued to provide additional hunting opportunity.
3) Game damage complaints will be addressed using game damage policy.
4) Six week archery season for antlered buck.

Exception HDs 150, 151, & 280:

1) Hunting season opens September 15 for antlered buck mule deer through the general season. Antlerless B licenses may be issued as needed.
2) Archery-only season ends Sept. 14

RESTRICTIVE HUNTING REGULATION

PURPOSE: The **Restrictive Hunting Regulation** is used during periods of unfavorable environmental conditions when population levels are substantially below the long-term average and recruitment is below average. Minimal antlerless harvest is recommended to facilitate population recovery. No additional non-resident A licenses will be recommended.

A **Restrictive Hunting Regulation** will be recommended if:

1) a) Recruitment is less than 30 fawns:100 adults as determined from aerial surveys; **AND,**
   b) The proportion of the buck harvest comprised of yearlings is at least 25% below the long-term average as determined from hunter check stations where available,
2) a) **OR** the total buck harvest (most recent 3 year average) in the northwest montane as determined by the statewide harvest survey is at least 25% below the long-term average
   b) **OR** where aerial surveys can be conducted, the total number of deer counted during spring on survey areas is at least 25% below the long-term average;
3) If less than 25% of the buck harvest monitored at check stations and/or the statewide harvest survey is 4 point or greater (including brow tines) for two

consecutive years, or where adequate samples of mule deer can be classified post season and buck:doe ratios are less than 10:100 following two consecutive years of fawn recruitment greater than 30 fawns:100 adults, then unlimited permits for bucks will be recommended.

Hunting Season (except HDs 150, 151, & 280):

1) Five weeks for antlered bucks. Unlimited permits for bucks will be recommended if parameter 3 (as defined above) is applicable. A permit will be guaranteed to all applicants. However, the permit will limit that person to hunt mule deer bucks in only the hunting district selected. If objectives are not met with unlimited buck permits after three consecutive hunting seasons, then a quota on buck permits will be recommended.
2) Localized game damage complaints on private land may require limited numbers of antlerless B licenses for specific portions of hunting districts
3) Game damage complaints will be addressed using game damage policy
4) Six week archery season for antlered bucks

Exception HDs 150, 151, and 280

1) Hunting season opens September 15 for antlered buck mule deer through the general season.
2) Archery-only season ends September 14.

LIBERAL HUNTING REGULATION

PURPOSE: **The LIBERAL HUNTING REGULATION** is used during periods of favorable environmental conditions when the population size is substantially above average and recruitment is high. A short either-sex season will be recommended along with antlerless B licenses to allow harvest of additional antlerless deer. Additional non-resident A licenses may be recommended.

A **Liberal Hunting Regulation** will be recommended if:

1) a) Recruitment is greater than 30 fawns:100 adults **AND,**
   b) The proportion of the buck harvest comprised of yearlings is more than 25% above the long-term average as determined from hunter check stations where available; **AND,**
2) a) The total buck harvest (most recent 3 year average) as determined by the statewide harvest survey is more than 25% above the long-term average,
   b) **OR** where aerial surveys can be conducted, the total number of deer counted during spring on survey areas is more than 25% above the long-term average.

3) If less than 25% of the buck harvest monitored at check stations and/or the statewide harvest survey is 4 point or greater (including brow tines) for two consecutive years, or where adequate samples of mule deer can be classified post season and buck:doe ratios are less than 10:100 following two consecutive years of fawn recruitment greater than 30 fawns:100 adults, then unlimited permits for bucks will be recommended.

Hunting Season (except HDs 150, 151, & 280):

1) Five weeks with first week either-sex, last four weeks antlered bucks. Unlimited permits for bucks will be recommended if parameter 3 (as defined above) is applicable. A permit will be guaranteed to all applicants. However, the permit will limit that person to hunt mule deer bucks in only the hunting district selected. If objectives are not met with unlimited buck permits after three consecutive hunting seasons, then a quota on buck permits will be recommended.
2) Moderate-high numbers of antlerless B licenses may be issued to provide additional hunting opportunity
3) Six week archery season for either sex

Exception HDs 150, 151, & 280:

1) Hunting season opens September 15 for antlered buck mule deer through the day prior to the beginning of the general season; then one week either-sex, followed by antlered bucks until the end of the general season. Antlerless B licenses may be issued as needed.
2) Archery-only season ends September 14.

MOUNTAIN-FOOTHILL:

Description: Hunting Districts: 204, 210, 211, 212, 213, 214, 215, 216, 240, 250, 260, 261, 270, 290, 291, 292, 293, 300, 301, 302, 310, 311, 312, 313, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 335, 339, 340, 341, 343, 350, 360, 361, 362, 370, 380, 390, 391, 392, & 393. Of these, hunting districts 210, 261, 270, 291, 300, east portion of 312, 313, 324, and 333 are special management districts (pages 32-36). This population management unit encompasses 24,030 square miles of southwestern Montana including high to moderate elevation mountain ranges (e.g. Elkhorn Mts., Bridger Range, west slope of Big Belts, Tendoy Mts., Bitterroot Range, Sapphire Mts., and Garnet Mts.) generally isolated from other ranges by large valleys.

Topography varies from gently undulating foothills to rugged mountainous terrain with elevations ranging from 4000-11000 feet. Topography and elevation cause variation in local climate and weather conditions across this population management unit. Most mountain ranges are oriented along a north-south trending axis. More persistent snow cover and a more restricted distribution of winter range generally characterize westerly aspects. Easterly aspects occur in drier rainshadow zones and provide more extensive areas of winter habitat. Vegetation in the foothills include a variety of shrub species (big sage, bitterbrush, mountain mahogany, and juniper) interspersed among bunch-grass communities dominated by bluebunch wheatgrass and Idaho fescue. Riparian areas support cottonwood, aspen, willow, and hawthorn. Conifer forests of Douglas fir, ponderosa pine, lodgepole pine, subalpine fir, and whitebark pine become prevalent with increasing elevation. Subalpine and alpine vegetation is restricted to elevations above about 8500 feet. Cattle grazing and both dryland and irrigated crops are primary uses of private land. Timber management, livestock grazing, and recreation are major uses of public land.

Mule deer in mountain-foothill environments contend with energy deficits in winter that are of longer duration than experienced in other population management units. Consequently, recruitment averages about 30 fawns:100 adults on winter ranges with severe environments and 40 fawns:100 adults on milder sites. Following periods of drought and severe winters, recruitment can reach lows of 5-20 fawns:100 adults while natural mortality of does can vary between 15-25%. Under these conditions, there is minimal opportunity for antlerless harvest. During periods of high recruitment (greater than 40 fawns:100 adults) and low natural mortality of does(1-3%), doe harvests of 12-20% will be required to stabilize population increases.

Post-season buck:doe ratios have fluctuated around 10:100 in a significant portion of this type because of plentiful hunter access to public lands and vulnerability of bucks late in the season. A number of special management districts with restrictive regulations were created during the late 1990s in Regions 2 and 3 to address low buck:doe ratios. During 1988-1995, about one third of all mule deer bucks harvested in this PMU were 4-point or larger.

Objective: ***Maintain the total number of deer observed during spring on population survey areas within 25% of the long-term average (at least ten years).***

STANDARD HUNTING REGULATION

PURPOSE: **The Standard Hunting Regulation** is implemented during those years when the population size is near average and recruitment is moderate. Natural losses of does will normally vary between 2-14%. Stabilizing the population will require a doe harvest rate of 1-15%.

A **Standard Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is within 25% of the long-term average; **AND,**
   b) Recruitment is between 20 and 40 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is within 25% of the long-term average
3) If the post season buck:doe ratio is less than 10:100 following two consecutive years of fawn recruitment greater than 40 fawns:100 adults, then unlimited permits will be recommended for bucks.

Hunting Season:

1) Five weeks for antlered bucks. Unlimited permits for mule deer bucks will be recommended if parameter 3 (as defined above) is applicable. A permit will be guaranteed to all applicants. However, the permit will limit that person to hunt mule deer bucks in only the hunting district selected. If the buck:doe ratio objective has not been met with unlimited buck permits after three hunting seasons, then a quota on buck permits will be recommended.
2) Low to moderate numbers of antlerless B licenses
3) Six week archery season for either sex

RESTRICTIVE HUNTING REGULATION

PURPOSE: The **Restrictive Hunting Regulation** is used during periods of unfavorable environmental conditions when the population size is substantially below average and recruitment is low. Natural losses of adult does will normally vary between 15-25%. The rate of doe harvest will be reduced by limiting the use of antlerless B licenses to localized game damage situations and implementing a general buck-only season. No additional nonresident A licenses will be recommended.

A **Restrictive Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is at least 25% below the long-term average; **AND**,
   b) Recruitment is less than 20 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is at least 25% below the long-term average
3) If the post season buck:doe ratio is less than 10:100 following two consecutive years of fawn recruitment greater than 40 fawns:100 adults, then unlimited permits will be recommended for bucks.

Hunting Season :

1) Five weeks for antlered bucks. Unlimited permits for mule deer bucks will be recommended if parameter 3 (as defined above) is applicable. A permit will be guaranteed to all applicants. However, the permit will limit that person to hunt mule deer bucks in only the hunting district selected. If the buck:doe ratio objective has not been met with unlimited buck permits after three consecutive hunting seasons, then a quota on buck permits will be recommended.
2) Localized game damage complaints on private land may require limited numbers of antlerless B licenses for specific portions of hunting districts
3) Six week archery season for antlered bucks

LIBERAL HUNTING REGULATION

PURPOSE: The **LIBERAL HUNTING REGULATION** is used during periods of favorable environmental conditions when the population size is substantially above average and recruitment is high. Natural losses of adult does are negligible. Stabilizing the population will require a doe harvest rate of 15-20%. Doe harvest rates should be higher in those areas where population decreases are necessary. Additional nonresident A licenses may be recommended.

A **Liberal Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is more than 25% above the long-term average; **AND,**
   b) Recruitment is greater than 40 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is more than 25% above the long-term average
3) If the post season buck:doe ratio is less than 10:100 following two consecutive years of fawn recruitment greater than 40 fawns:100 adults, then unlimited permits will be recommended for bucks.

Hunting Season:

1) Five weeks (first two weeks either sex; last three weeks antlered bucks). Unlimited permits for mule deer bucks will be recommended if parameter 3 (as defined above) is applicable. A permit will be guaranteed to all applicants. However, the permit will limit that person to hunt mule deer bucks in only the hunting district selected. If the buck:doe ratio objective has not been met with unlimited permits after three consecutive hunting seasons, then a quota on buck permits will be recommended.
2) Moderate-high numbers of antlerless B licenses by hunting district
3) Six week archery season for either sex

PRAIRIE/MOUNTAIN FOOTHILL:

Description: Hunting Districts 315, 413, 415, 416, 418, 420, 421, 422, 423, 424, 425, 432, 441, 442, 445, 446, 447, 448, 449, 452, 454, 455, 540 and 580. Of these, hunting districts 441 and 455 are special management districts (pp. 37). This population management unit encompasses 10,233 square miles of central Montana and includes the Rocky Mountain Front, east slope of the Big Belt Mts., Little Belts, the Judiths, the Castles, and the Crazies.

This population management unit represents a transition zone having characteristics of both the mountain/foothill and the prairie/breaks units. Topography varies from low rolling hills to steep, rugged mountain canyons. Elevations range from less than 4,000 feet to over 9,000 feet near the Continental Divide. Precipitation is highly variable ranging from 10 - 12 inches at lower more arid sites to more than 40 inches in the mountains. Vegetation varies from shrub grassland, through montane forest with intermountain grassland, to alpine ridge tops. Cottonwood, willow and aspen dominate riparian areas. Cattle grazing is the primary land use. Cropland is primarily irrigated and dry land alfalfa.

During favorable environmental conditions, fawn recruitment rates are nearly as high as that of the prairie. However, severe winter weather conditions and/or significant periods of drought can cause recruitment to decline to rates nearly as low as mountain foothill populations. Hunting pressure is somewhat lower than the mountain/foothill unit due to restricted private land access. Therefore, hunting regulations can include more either sex hunting opportunities than the mountain/foothill unit during population increases.

Some of these populations have complex, long-range migrations between seasonal habitats. Harvest strategies should be designed in such a way as to ensure maintenance of these migratory traditions.

Objective: ***Maintain the total number of deer observed during spring on population survey areas within 25% of the long-term average (at least ten years).***

STANDARD HUNTING REGULATION

PURPOSE: **The Standard Hunting Regulation** is implemented during those years when the population size is near average and recruitment is moderate. It has been documented that average recruitment is higher than in the mountain foothills, although it is speculated that natural losses of does are somewhat lower. Correspondingly, the rate of doe harvest required to stabilize the population is higher than in the mountain foothills.

A **Standard Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is within 25% of the long-term average; **AND**,
   b) Recruitment is between 30 and 45 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, buck harvest is within 25% of the long-term average

Hunting Season:

1) Five weeks for either sex
2) None to moderate numbers of antlerless B licenses
3) Six week archery season for either sex

RESTRICTIVE HUNTING REGULATION

PURPOSE: The **Restrictive Hunting Regulation** is used during periods of unfavorable environmental conditions when the population size is substantially below average, recruitment is low, and natural losses of does increases. The rate of doe harvest will be reduced by limiting the use of antlerless B licenses to localized game damage situations and implementing a general bucks only season. No additional nonresident A licenses will be recommended.

A **Restrictive Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is at least 25% below the long-term average; **AND**,
   b) Recruitment is less than 30 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is at least 25% below the long-term average

Hunting Season:

1) Five weeks for antlered bucks
2) Localized game damage complaints on private land may require limited numbers of antlerless B licenses for specific portions of hunting districts
3) Six week archery season for antlered bucks

LIBERAL HUNTING REGULATION

PURPOSE: The **Liberal Hunting Regulation** is used during periods of favorable environmental conditions when the population size is substantially above average, recruitment is high, and natural losses of does are negligible. It is speculated that doe harvest of up to 25% of the estimated doe population will be required to stabilize the population. Additional nonresident A licenses may be recommended.

A **Liberal Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is more than 25% above the long-term average; **AND**,
   b) Recruitment is greater than 45 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is more than 25% above the long-term average

Hunting Season:

1) Five weeks for either sex
2) Liberal numbers of antlerless B licenses with option for issuing multiple licenses either through the drawing or over the counter. Licenses will be valid by hunting district.
3) Six week archery season for either sex

SOUTHERN MOUNTAINS:

Description: Hunting Districts: 313, 314; 316, 317, 510, 520 and 560. Of these hunting districts 313 and 510 are special management districts (pp. 35 and 38). This population management unit encompasses 4,226 square miles in the Absaroka, Beartooth and Pryor Mountains and a portion of the Gallatin Range in south-central Montana.

Topography varies from rolling hills to sheer mountain canyons thousands of feet deep. Elevations range from 4,500 feet to nearly 13,000 feet. Precipitation varies from less than six inches annual rainfall in the Cottonwood Triangle to more than 40 inches per year in the mountain environments. Vegetation varies from shrub desert, through montane forest with intermountain grassland, to alpine plateaus. Cottonwood, willow and, aspen dominate riparian areas. Cattle grazing is the primary land use. Cropland is primarily irrigated and dry land alfalfa, though the Clark's Fork valley supports corn and sugar beet production.

Fawn recruitment generally averages less than 40 fawns:100 adults. In poor years fawn recruitment is frequently less than 25 fawns:100 adults while in good years recruitment seldom exceeds 50:100. Unlike adjacent prairie/breaks and prairie/mountain foothill populations, many southern mountain populations have shown minimal recovery since the declines in the mid-1970s. Given low fawn recruitment and continued low population densities, total harvest should not exceed 15% of the doe population in the best years. Post season buck:doe ratios seldom exceed 15:100 because 70+% of the resident bucks are harvested in many years. Between 1988 and 1995, 42% of the bucks harvested had 4 points on at least one side (range 34%-51%).

Some of these populations have complex, long-range migrations between seasonal habitats. Harvest strategies should be designed in such a way as to ensure maintenance of these migratory traditions.

Objective: ***Maintain the total number of deer observed during spring on population survey areas within 30% of the long-term average (at least ten years).***

STANDARD HUNTING REGULATION

PURPOSE: **The Standard Hunting Regulation** is implemented during those years when the population size is near average and recruitment is moderate. It has been documented that recruitment is somewhat lower in the east portion of the southern mountains compared to the mountain foothills, but somewhat higher in the west portion. Some southern mountain populations exhibit long distance migrations, and require careful antlerless harvest management to maintain these specialized traditions of habitat use. Some of these populations have remained at low levels since the mid-1970s. Therefore, doe harvest rates should not exceed 10% of the estimated doe population.

A **Standard Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is within 30% of the long-term average; **AND**,
   b) Recruitment is between 30 and 45 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is within 25% of the long-term average

Hunting Season (except HD 316):
1) Five weeks for antlered bucks
2) None to moderate numbers of antlerless B licenses by hunting district
3) Six week archery season for either sex

Exception HD 316:
1) Hunting season for antlered bucks beginning Sept. 15 and ending with general season
2) No archery only season

RESTRICTIVE HUNTING REGULATION

PURPOSE: The **Restrictive Hunting Regulation** is used during periods of unfavorable environmental conditions when the population size is substantially below average and recruitment is low. The rate of doe harvest will be reduced by limiting the use of antlerless B licenses to localized game damage situations and implementing a general buck-only season. No additional nonresident A licenses will be recommended.

A **Restrictive Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is at least 30% below the long-term average; **AND**,
   b) Recruitment is less than 30 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is at least 25% below the long-term average

Hunting Season (except HD 316 - same as standard):
1) Five weeks for antlered bucks
2) Localized game damage complaints on private land may require limited numbers of antlerless B licenses for specific portions of hunting districts
3) Six week archery season for antlered bucks

LIBERAL HUNTING REGULATION

PURPOSE: The **LIBERAL HUNTING REGULATION** is used during periods of favorable environmental conditions when the population size is substantially above average and recruitment is high. Natural losses of adults does are negligible. Additional nonresident A licenses may be recommended.

A **Liberal Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is more than 30% above the long-term average; **AND**,
   b) Recruitment is greater than 45 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is more than 25% above the long-term average

Hunting Season (except HD 316 - same as standard):

1) Five weeks with first eight days either-sex, last four weeks antlered bucks
2) Moderate to liberal number of antlerless B licenses by hunting district
3) Six week archery season for either sex

PRAIRIE/BREAKS:

Description: Hunting Districts 400, 401, 403, 404, 405, 406, 410, 411, 412, 417, 419, 426, 444, 450, 471, 500, 502, 511, 530, 570, 575, 590, all 600 and 700 series districts. Hunting districts 530 and 652 are special management districts (pp. 38).

The prairie/breaks population management unit encompasses 77,663 square miles in the eastern two thirds of Montana, and includes some hunting districts in Regions 4 and 5 and all hunting districts in Regions 6 and 7 (Fig. 1). Landforms consist of flat to rolling benchlands, ponderosa pine savannahs, rugged badlands or breaks adjacent to major rivers, and riparian areas. The semi-arid climate is characterized by hot, dry summers and cold, dry winters, but large annual fluctuations in temperature and precipitation during all seasons are common. Dryland small grain farming and livestock grazing are the primary commercial land uses, except in the major river valleys where irrigated acreage produces alfalfa, sugar beets, corn, and small grains.

Native habitats consist primarily of grasslands, sagebrush/grasslands, deciduous shrub/grasslands, hardwood draws, breaks, and river bottoms. Grasslands in good condition are dominated by western wheatgrass, thickspike wheatgrass, slender wheatgrass, bluebunch wheatgrass, green needlegrass, little bluestem, and various forbs. Shrubs found in sagebrush/grasslands consist of big sagebrush, silver sagebrush, rubber rabbitbrush, skunkbrush sumac, and black greasewood, while deciduous shrub/grasslands include buffaloberry, chokecherry, snowberry, wild rose, and hawthorn. Ponderosa pine is the major tree species in savannahs, and, along with Rocky Mountain and common juniper, predominates in breaks habitats. Hardwood draws feature green ash, boxelder, American plum, and American elm, while river bottoms are dominated by plains cottonwood and willows.

Seventy to 90% of the land in this management unit is in private ownership, with blocks of public land scattered throughout. Public lands are primarily under federal management by the Bureau of Land Management, the U.S. Forest Service, or the U.S. Fish and Wildlife Service. State lands accessible to the public include areas managed by Montana Fish, Wildlife, and Parks or the Department of Natural Resources and Conservation. Land open and accessible to the public for hunting ranges from a low of 10% in the southeast to 95% in portions of the northeast.

More than 85% of the management unit supports mule deer at least during a portion of the year. Mule deer are found primarily in the uplands and in associated riparian areas along smaller streams, but may use major river bottom habitats at times. Areas where mule deer have access to agricultural crops generally support comparatively higher densities of deer. In response to weather conditions that often vary greatly from year to year, mule deer populations in this unit generally have larger fluctuations than those in the mountains.

Recruitment can vary widely on an annual basis, and ranges from less than 30 fawns:100 adults in poor years to more than 60 fawns:100 adults in good years. Post-season buck:doe ratios range from approximately 10 bucks:100 does to 50 bucks:100 does. During the period from 1988 through 1995, an average of 36% of the antlered mule deer harvest consisted of four point or larger bucks in the southwest portion of the unit, while in the southeast portion of the unit the average was 64%.

The northwest portion of the management unit (hunting districts 400, 401, 403, and 406) includes the Sweetgrass Hills and a portion of the Golden Triangle. Cattle ranching, hay production, and grain farming are the major agricultural uses. Oil and gas production is important near Conrad, Shelby, and Cut Bank. The area is heavily roaded due to intensive agriculture and oil and gas activities. Game damage complaints resulting from mule deer are rare. The hunting season has been three weeks in this area due to the preponderance of private land, intensive agriculture, and extensive road access.

Objective: ***Maintain the total number of deer observed during spring on population survey areas within the range of 20% above and 30% below the long-term average (at least 10 years).***

STANDARD HUNTING REGULATION

PURPOSE: **The Standard Hunting Regulation** is implemented during those years when the population size is near average and recruitment is moderate. Natural losses of does will normally vary between 2-10%. Stabilizing the population will require a doe harvest rate of 10-25%. No additional nonresident A licenses will be recommended.

A Standard Hunting Regulation will be recommended if:

1) a) The total number of deer counted on the survey area is within the range of 20% above and 30% below the long-term average; **AND**,
   b) Recruitment is between 30 and 60 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is within 25% of the long-term average

Hunting Season (except HD 400, 401, 403, & 406):

1) Five weeks for either-sex
2) None to moderate numbers of antlerless B licenses (no more than 50% of liberal package)
3) Six week archery season for either sex

Exception HDs 400, 401, 403, & 406:

1) Hunting season is three weeks

RESTRICTIVE HUNTING REGULATION

PURPOSE: The **Restrictive Hunting Regulation** is used during periods of unfavorable environmental conditions when the population size is substantially below average and recruitment is low. Natural losses of adult does will normally vary between 10 and 20%. The rate of doe harvest will be reduced by limiting the use of antlerless B licenses to localized game damage situations and implementing a general buck-only season. No additional nonresident A licenses will be recommended.

A **Restrictive Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is at least 30% below the long-term average; **AND,**
   b) Recruitment is less than 30 fawns:100 adults
2) **OR**, in the absence of long-term aerial survey data, the buck harvest is at least 25% below the long-term average

Hunting Season (except HD 400, 401, 403, & 406):

1) Five weeks for antlered bucks
2) Localized game damage complaints on private land may require limited numbers of antlerless B licenses for specific portions of hunting districts
3) Six week archery season for antlered bucks

Exception HDs 400, 401, 403, & 406:

1) Hunting season is three weeks

LIBERAL HUNTING REGULATION

PURPOSE: The **LIBERAL HUNTING REGULATION** is used during periods of favorable environmental conditions when the population size is substantially above average and recruitment is high. Natural losses of adults does are negligible. Stabilizing the population will require a doe harvest rate of 25-30% of the estimated doe population. Doe harvest rates should be higher in those areas where population decreases are necessary. Additional nonresident A licenses may be recommended.

A **Liberal Hunting Regulation** will be recommended if:

1) a) The total number of deer counted on the survey area is more than 20% above the long-term average; **AND,**
   b) Recruitment is greater than 60 fawns:100 adults

2) **OR**, in the absence of long-term aerial survey data, the buck harvest is more than 25% above the long-term average

Hunting Season (Except HD 400, 401, 403, & 406):

1) Five weeks for either sex
2) Liberal numbers of antlerless B licenses with option for issuing multiple licenses either through the drawing or over-the-counter. These licenses will be valid by hunting district or groups of hunting districts.
3) Six week archery season for either sex

Exception HDs 400, 401, 403, & 406:

1) Hunting season is three weeks

MULE DEER SPECIAL MANAGEMENT DISTRICTS

Hunting opportunity and buck harvest is limited in 16 hunting districts to a) reduce the harvest of antlered bucks; b) increase post season buck:doe ratios; and c) meet demand for a limited number of people to harvest an older aged buck in areas with good access.

FWP has documented a demand for increased opportunity to hunt older-aged bucks in some hunting districts with reasonable public access. A 1988 survey of deer hunters determined that although Montana deer hunters were a very heterogeneous group, they could be categorized into four groups: generalists-enthusiasts (27%), meat hunters (36%), generalists-meat hunters (14%), and trophy hunters (23%).

Another deer hunting preference survey was conducted in 1995. The purpose of the survey was to: a) measure the acceptability of certain hunting regulations among resident and nonresident hunters and b) to determine what factors influence where a hunter chooses to go hunting. The findings of the survey indicated that all hunters, no matter their preferences, want to maintain their hunting opportunity with as few restrictions as possible. Most enjoy eating venison. In addition, it was apparent that 15-20% of hunters, were demanding more hunting restrictions to improve buck numbers and the chance at hunting an older aged buck. Fifteen percent of the respondents rated taking a trophy buck as the second most important reason for hunting, behind enjoyment of the outdoors and the hunting experience. Another 32% ranked taking a trophy as third, with obtaining venison as second behind enjoyment of the outdoors and the hunting experience. Most hunters in these two categories were highly influenced on their choice of hunting area by the number of bucks perceived to be in the hunting area. Although some were after a trophy, all wanted a chance to harvest an older aged buck.

FWP concludes that results from hunting preference surveys, comments received during season setting meetings, and the environmental analysis conducted for the 1997 hunting season do not support a statewide change toward restrictive hunting regulations to improve opportunity for taking older aged bucks across large geographic areas. Giving up the opportunity to hunt and to shoot a deer to improve buck numbers and age structure was unacceptable to the majority. However, there was support from a minority of hunters to limit hunting opportunity and buck harvest in some hunting districts where access is currently good. Areas with adequate security still occur throughout the state and provide opportunities for taking larger bucks with post-season buck:doe ratios exceeding 20:100. However, this has not met the demand of those that seek similar opportunities in more accessible public land areas. Selecting a few hunting districts (16 of 159) to limit hunting opportunity and the harvest of bucks (by permit in most circumstances) has met this minority demand while minimizing the impact to outfitting and hunting opportunity for the majority of hunters. Permit holders will be limited to that hunting district for mule deer buck hunting.

The criteria used to select the districts were:

1) The hunting districts should be within that portion of the state where the hunting opportunity for bucks and buck age diversity is low. This will reduce the impact to hunting opportunity statewide and still provide at least one or two areas reasonably close to a hunter s place of residence.
2) There should be only a few districts chosen because of the impact of such a restriction on hunting opportunity and the statewide impact of the resulting redistribution of hunters.
3) There should be significant hunter interest in managing for older bucks in the area.
4) The locations should be accessible to hunting; that is, the hunting district should not be an area with a considerable amount of closed private land. This will increase the shift of hunters but areas with limited access do not correspond to where the demand for hunting older bucks is coming from.
5) The area should not have a naturally high buck:doe ratio because of limited access (i.e. wilderness etc.)

The hunting districts selected are: 202, 210, 261, 270, 291, 300, portion of 312, 313, 320, 324, 333, 441, 455, 510, 530 and 652 (Fig. 1).

Goal: ***To provide hunting opportunity for older aged bucks in a limited number of districts offering reasonable public access.***

HUNTING DISTRICT 202

This district is located in the lower Clark Fork area south of Superior and St. Regis and adjacent to Idaho. Post-season helicopter surveys had indicated very low buck:doe ratios. Interest has been expressed in the Superior area for managing for more and older mule deer bucks. This district, although heavily timbered for the most part, has a extensive network of logging roads resulting in 82% of the land area of the district within one mile of a road. Ninety-four percent of this HD is in USFS or Plum Creek Timber ownership. This HD has historically had a 5 week any-buck season. During 1995, outfitters did not report that any mule deer bucks were harvested by clients in this district.

Objective:

1) Post -season buck:doe ratio at least 40:100
2) A minimum of 30% of bucks harvested are at least 4 years old

Hunting Season:

1) Five-week antlered buck mule deer by permit quota
2) Limited antlerless B licenses - an option to address population goal for unit or game damage complaints

3) Special Archery season 6 weeks for antlered buck mule deer by permit quota

HUNTING DISTRICT 210

This hunting district, located between Flint Creek and Rock Creek, had buck:doe ratios from 3 to 7:100 during an 8 year time period. This district contains low security habitat with 82% of the land area within one mile of a road. There has been public interest in managing for higher numbers of bucks in this area, although it hasn t been as strong as in the Bitterroot hunting districts. Sixty-five percent of this HD is either in USFS or Plum Creek ownership. A considerable portion of the private land is enrolled in Block Management. This HD has historically had a 5-week any buck season. During 1995, outfitters reported clients in this district harvested 3 mule deer bucks.

Objective:

1) Post -season buck:doe ratio at least 40:100
2) A minimum of 30% of bucks harvested are at least 4 years old

Hunting Season:

1) Five week antlered buck mule deer by permit quota
2) Limited antlerless B licenses - an option to address population goal or game damage complaints
3) Special Archery season 6 weeks for antlered buck mule deer by permit quota

HUNTING DISTRICTS 261 AND 270

These hunting districts are located in the Bitterroot, and with the exception of a few years, have consistently had post-season buck:doe ratios less than 10:100 while fawn recruitment has been generally good. These HDs, which are located in the Sapphire Range, are in highly accessible, low security habitat. The percent of these HDs within one mile of a road ranges from 76% to 92%. The average age of mule deer bucks checked through the Darby Checking Station has fluctuated between 2 and 2 years old for 20 years. There has been considerable hunter interest for a number of years to manage for a higher number and a greater age diversity of bucks. Since 1992 the mule deer buck season in these districts has closed November 15 in an attempt to reduce buck harvest. However, this strategy has not proven to be effective based upon checking station data and the trend in post-season buck:doe ratios. Land ownership of HD 261 is approximately 49% USFS and 82% of HD 270 is USFS. In general, these hunting districts are highly accessible. During 1995, outfitters reported clients harvested 6 and 17 mule deer bucks in HD 261 and 270, respectively.

Objective:

1) Post -season buck:doe ratio at least 40:100
2) A minimum of 30% of bucks harvested are at least 4 years old

Hunting Season:

1) Five-week antlered buck mule deer by permit quota
2) Limited antlerless B licenses an option to address population goal for unit or game damage complaints
3) Special Archery season 6 weeks antlerless mule deer with mule deer buck permits

HUNTING DISTRICT 291

This hunting district includes the East Garnet Range located between Drummond, Avon and Helmville which has been managed with a restrictive season for bucks since 1986. Post-season buck:doe ratios have ranged between 12 and 22 bucks:100 does during the past 10 years. Prior to the implementation of a permit-only buck season following one week of any buck hunting in 1986, buck:doe ratios were generally 4-5 bucks:100 does. Incisors have been collected from harvested bucks since 1986, and although sample sizes are small, the average age of bucks harvested has increased from 2.4 years old in 1986 to 4.2 years in 1992. The average age in 1995 was 3.8 years. This HD has relatively low habitat security with 89% of the land area within one mile of a road. It is also within a drier habitat and contains more open grass/shrub habitat, and is not as heavily timbered as other districts. Twenty-four percent of the HD is in BLM, DNRC, or Plum Creek ownership. Although this HD has a large amount of private land, much of it is enrolled in the Block Management program, and access is good. During 1995, outfitters reported clients harvested no mule deer bucks in this district.

Objective:

1) Post -season buck:doe ratio at least 40:100
2) A minimum of 30% of bucks harvested are at least 4 years old

Hunting Season:

1) Five week antlered buck mule deer by permit quota
2) Limited antlerless B licenses - an option to address population goal for unit or game damage complaints
3) Special Archery season 6 weeks for antlered buck mule deer by permit quota

HUNTING DISTRICT 300

This hunting district is located in the southwest portion of Region 3 from the town of Lima to the Idaho border. The area is popular for elk hunting, and attracts a considerable amount of hunting pressure. In 1995, 52 mule deer bucks were harvested. For the hunting seasons from 1991-95 in this 230 square mile area, an average of 0.4 mule deer bucks and 0.2 four point and larger bucks were taken per square mile. FWP has conducted long-term spring surveys in Little Sheep Creek, a major winter range in the district. The population trend has been down in the mid-1990s, approaching the low levels of the 1970s. Winter classifications have

previously mostly been from the ground. Buck/doe ratios have ranged from 10 to 20:100 in the 1980s to less than 10:100 in the 1990s. A newly established winter helicopter survey in the winter of 1996-97, placed the buck:doe ratio at 7:100. Interest in improving buck hunting opportunity has been expressed by some members of the public. Since the 1970s, the area has had a 5-week antlered buck mule deer season with antlerless permits. The area has large amounts of public land and has 3 main access points, with some roadless areas due to travel restrictions. During 1995, outfitters reported clients in this district harvested 2 mule deer bucks.

Objective:

1) Post-season buck:doe ratio at least 25:100
2) A minimum of 40% of bucks harvested are at least 4 years old.

Hunting Season:

1) Antlered buck mule deer by permit quota
2) Limited antlerless B licenses - an option to address population goal for unit or game damage complaints
3) Special archery season 6 weeks for antlered buck mule deer by permit quota or antlerless when standard or liberal regulations

HUNTING DISTRICT 312-01 (WEST BRIDGER MOUNTAINS AND EASTERN PORTION OF THE GALLATIN VALLEY)

This portion of hunting district 312 encompasses the west Bridger Mountains and eastern portion of the Gallatin Valley. This 545 square mile area sustains a population of about 2000 ±300 mule deer. Long-term research during the last 25 years indicates that the buck segment of the population is significantly influenced by fawn recruitment patterns, natural mortality of adult bucks, and hunter harvest. During 1995-1997, declining recruitment and increases in hunter harvest and natural mortality resulted in the lowest number of bucks in the post season population in the 25 year period. During this same period, total population size has declined to levels comparable to the mid 1970s deer decline. Public comment has indicated general support for improving hunter opportunity for mature bucks. During 1995, outfitters reported clients in this district harvested 4 mule deer bucks.

Objective:

1) Post-season buck:doe ratio at least 25:100
2) A minimum of 40% of bucks harvested are at least 4 years old

Hunting Season:

1) Five week antlered buck mule deer by permit quota
2) Limited antlerless B licenses - an option to address population goal for unit or game damage complaints

3) Special archery season 6 weeks for antlered buck mule deer by permit quota or antlerless when standard or liberal regulations

HUNTING DISTRICT 313

This 180 square mile hunting district is located just northeast of the town of Gardiner adjacent to Yellowstone National Park with most hunting on public land. The area receives heavy hunting pressure from sportsmen pursuing migrating elk coming out of Yellowstone National Park. For the hunting seasons during 1991-95, an average of 1.9 mule deer bucks and 0.9 four point and larger bucks were harvested per square mile. Although there was a significant decline in the mid-1990s, aerial surveys indicate this population up to that point had been generally stable. Fawn recruitment was low in 1996-97. Local interest in improving the buck:doe ratios has resulted in a presently shortened mule deer buck season in order to reduced pressure on mule deer during the rut and during the period of heavy elk hunting pressure. This season length reduction appeared to work following the 1995 hunting season when the buck:doe ratio was found to be 22:100. The ratio dropped to 12:100 after the 1996 season. During 1995, outfitters did not report any mule deer bucks harvested by clients in this district.

Objective:

1) Post season buck:doe ratio at least 15:100
2) A minimum of 35% of bucks observed post-season are 2 1/2 years or older
3) To increase the probability of harvesting older bucks

Hunting Season:

1) Three week antlered buck mule deer
2) Limited antlerless B licenses - an option to address population goal for unit or game damage complaint
3) Special archery season 6 weeks for antlered buck mule deer or antlerless when standard or liberal regulations in effect

HUNTING DISTRICTS 320 AND 333

These districts comprise the Tobacco Root Mountains that lie between Whitehall and Ennis. The core of the area is mostly public land. This 928 square mile area has adequate security as a result of limited access in some areas and very rugged topography. The mule deer buck harvest has been limited to four point animals since 1986 and more recently in 1994, the season was shortened by two weeks. The average harvest for the years 1991-95 was 0.6 four point mule deer bucks per square mile. Since 1986, the buck:doe ratios have ranged between 20 and 30:100. Survival of four point bucks through the hunting season did not increase until the season was shortened in 1994. Public interest, particularly from the Jefferson Valley Sportsmen's Association, has been high in having this area produce larger bucks. During

1995, outfitters reported clients harvested 0 and 2 mule deer bucks in HD 320 and 333, respectively.

Objective:

1) Post season buck:doe ratio at least 25:100.

Hunting Season:

1) Four point mule deer buck
2) Three week mule deer buck season (ends Nov. 15)
3) Special archery season 6 weeks with four point mule deer buck or antlerless when standard or liberal regulation in effect
4) Limited antlerless B licenses an option to address population goal for unit or game damage complaints

HUNTING DISTRICT 324

This district lies south of the town of Alder in the Gravelly Mountain range. This 483 sq. mile area is very popular with elk hunters and winters several thousand elk on the Robb Creek and Blacktail Creek Wildlife Management Areas. Aerial surveys point to a declining mule deer population in recent years. The public has expressed concern about mule deer in the area and an interest in improving the buck:doe ratio. Check stations in the area show a decline in the mule deer buck kill by as much as 75% in recent years. The average harvest from 1991-95 showed 0.5 mule deer bucks per square mile and 0.2 four-point bucks per square mile. The total kill in 1995 was 123 mule deer bucks. Aerial surveys have indicated a range of 10 to 20 bucks:100 does in the 1980s to less than 10:100 during the 1990s. Much of this area is public land with variable road restrictions. During 1995, outfitters reported clients in this district harvested 3 mule deer bucks.

Objective:

1) Post season buck:doe ratio at least 25:100
2) A minimum of 40% of bucks harvested are at least 4 years old

Hunting Season:

1) Five week antlered buck mule deer by permit quota or antlerless when standard or liberal regulations
2) Limited antlerless B licenses an option to address population goal for unit or game damage complaints
3) Special archery season, 6 weeks for antlered buck mule deer by permit quota or antlerless when standard or liberal regulations

HUNTING DISTRICT 441

Mule deer in this mountainous hunting district are characterized by long distance migrations. They move to winter ranges on the prairie edge. Presently, the first two weeks are an any-buck season, followed by three weeks of buck hunting by permit quota on the A license. The permit portion of the season was imposed to address citizen concerns for the 'boom or bust' cycle of buck hunting and harvest as it occurred in the district. Years of light buck harvest were periodically followed by a year or two of very heavy buck harvest, attributable to weather and snow conditions. There has not been great concern by hunters about the lack of age diversity or buck numbers, except for the occasional year of heavy buck harvest. Buck numbers quickly rebounded each time. Permit hunting with the A license has served to moderate fluctuations in buck harvest. These permits are readily accepted and coveted by the hunting public. Deer harvest by outfitted clients was not compiled for this district.

Objective:

1) Post -season buck:doe ratio at least 25:100
2) At least 60% of bucks harvested are 4 point or greater

Hunting Season:

1) Five-week season; first two weeks antlered buck mule deer; last three weeks antlered buck mule deer by permit quota
2) Limited antlerless B licenses an option to address population goal for unit or game damage complaints
3) Special Archery season 6 weeks with mule deer buck permits

HUNTING DISTRICT 455

Permit only mule deer hunting for the entire general season has been driven by the overwhelming presence of elk and elk hunters in the district. Hunters now appreciate the opportunity to simply observe bucks (a few bigger ones) while elk hunting. The district does not support large numbers of mule deer, so the opportunity for substantial harvests of older bucks is minimal. Outfitting is not permitted on the Beartooth WMA.

Objective:

1) Post -season buck:doe ratio at least 20:100
2) A minimum of 50% of bucks harvested are 4 point or greater

Hunting Season:

1) Five week either sex by permit quota
2) Limited antlerless B licenses an option to address population goal for unit or game damage complaints
3) Special Archery Season 6 weeks either sex mule deer permits

HUNTING DISTRICT 510

This district includes the Pryor Mountains of southcentral Montana and surrounding foothills. Habitat security is high in portions of the district due to topography and snow conditions which restrict access later in the fall during most years. This security allows for the hunting season structure to be less restrictive than in other districts such as HD530.

Objective:

1) Post-season buck:doe ratio at least 25:100
2) A minimum of 30% of bucks harvested are at least 4 years old.

Hunting Season:

1) Unlimited antlered mule deer buck permits
2) Limited antlerless B licenses an option to address population goal for unit or game damage complaints
3) Special archery season 6 weeks with antlered mule deer buck permits

HUNTING DISTRICT 530

This district consists of 2,049 square miles of predominately rolling prairie with sparsely timbered hills along portions of its south border and the Little Snowy Mountains in the northwest corner. Habitat security is low and access is generally good. Permit only mule deer buck hunting was initiated in 1987 following landowner and sportsmen dissatisfaction with post season buck:doe ratios of 4:100. Since 1987, post season ratios have averaged 28 bucks:100 does. In all prairie hunting districts of Region 5, mule deer bucks 4 years of age make up 7% of the bucks aged at check stations vs. 29% for hunting district 530. Permit quota buck hunting has resulted in both a higher buck:doe ratio and older age structure. Deer harvest by outfitted clients was not compiled for this district.

Objective:

1) Post -season buck:doe ratio at least 25:100
2) A minimum of 30% of bucks harvested are at least 4 years old

Hunting Season:

1) Five week antlerless with antlered buck by permit quota
2) Limited antlerless B licenses an option to address population goal for unit or game damage complaints
4) Special archery season six weeks antlerless with antlered mule deer buck permits

HUNTING DISTRICT 652

Permit only hunting for mule deer bucks during the archery and general seasons. Antlerless mule deer and either-sex white-tailed deer remain valid on any A license. This regulation package has been in effect since 1987. The habitat in this area is sagebrush/grassland in a badland setting. Travel restrictions exist on the CMR Refuge portion which comprises approximately 30% of the hunting district. The majority of the hunting district is public land and a large part of the private land is in the Block Management Program. Post-season buck:doe ratios were 37:100 during a total survey conducted following the 1997 hunting season. The buck:doe ratios have ranged between 21 and 68:100 over seven years. This season type has resulted in more mule deer bucks in the 4-6 year age class, but has not produced antler sizes that are larger than those found throughout Eastern Montana. The 200 permits have generally resulted in an even split between successful hunters, unsuccessful hunters and those who do not take advantage of their permit opportunity. Deer harvest by outfitted clients was not compiled for this district.

Objective:

1) Post -season buck:doe ratio at least 40:100
2) Minimum post season population density of 3.0 observed per square mile.
3) Minimum 50% of bucks harvested $\geq$4.5 years old and minimum of 30% of bucks harvested $\geq$5.5 years old.

Hunting Season:

1) Five week antlered buck mule deer by permit quota
2) Option for five week antlerless mule deer on A license and/or in special archery season.
3) Option for limited antlerless B licenses to address population goal for unit or game damage complaints
4) Special archery season 6 weeks for antlered buck mule deer by permit quota

MULE DEER MONITORING GUIDELINES

These aerial survey guidelines are designed to ensure that accurate data on size and composition of mule deer populations are collected in a consistent and coordinated manner among the major environmental types in Montana. Status and trend in these data and their relationship to important environmental factors represents the foundation of informed management decisions concerning the effects of hunter harvest. Two categories of aerial survey effort have been identified in the monitoring program: 1) Census Areas 2) Trend Areas.

Census Areas

Using a statewide perspective, a total of 13 monitoring areas representing important mule deer populations occupying major environmental types have been strategically selected across Montana (Fig. 1, Appendix Table 1). On each census area, precise data describing population size and composition will be collected for input into computer models that simulate population changes in important environments.

To achieve a dependable level of precision on each census area, each year, one full-coverage count and classification survey will be conducted post-season (after the hunting season and before antler shedding). During the early spring "green up window", mule deer are highly concentrated in open habitats in most environments east of the Continental Divide. Mule deer traditionally use the same habitat in spring year after year. We speculate that there is little annual variation in rates of aerial observability during spring within a particular environmental type (see page 157 in Mackie et al. Ecology and Management of Mule Deer and White-tailed Deer in Montana, 1998). One full coverage count/classification survey will be followed soon after, by two full-coverage replicate flights to count deer in early spring. This combination of three flights during the green up will provide confidence limits around the number of deer counted in the population occupying the census area. Using this approach, we should be able to reliably detect annual changes in population size of 20%. This level of detection is compatible with our population indicators and can identify population changes that warrant a shift in regulation packages. Notice that the two replicate flights do not require classification of the deer observed. Therefore, significantly less air time should be required compared to the primary spring flight.

Census areas will provide the high quality data bases necessary to experimentally measure the effects of various harvest rates and hunting season regulations. This could be accomplished by using adjacent areas under different sets of harvest regulations (control/treatment design). By coupling this intensive monitoring effort with computer modeling, we can increase our understanding of deer populations and their response to hunter harvest.

Census areas will provide deer managers with a network of 13 early "warning lights" that can signal significant changes in population size and composition. These areas would also provide

accurate benchmarks for each administrative region to evaluate the less intensive but more site-specific population data derived from the more numerous deer trend areas. Currently, the number of census areas selected in each of the administrative regions include: R1-1, R2-2, R3-2, R4-2, R5-2, R6-2, and R7-2.

Trend Areas

Using a regional perspective, each of the seven wildlife managers have selected representative trend areas (Fig. 1, Appendix Table 1). In contrast to census areas, trend areas must be more numerous because they are designed to generally monitor the spatial variation in deer population dynamics and hunter opportunity that is so important to regional deer management objectives. Trend areas should be stratified among the different environments occupied by mule deer and among public and private lands offering different levels of hunter access.

Annually, on each trend area, a post season survey will be flown to monitor fawn:doe and buck:doe ratios. At this time of year, aerial observability of mule deer often varies considerably depending on environmental conditions. Therefore, the focus of post season surveys on trend areas is to obtain classification data rather than monitoring total deer numbers. We recommend that a well distributed classification sample is collected from the various habitat types occurring across the trend area. Differential distribution of bucks and does during the post season time period requires careful consideration by the local biologist in the sampling design. The minimum number classified should approach 50% of the number of deer recorded during the previous spring survey.

Some trend areas may not be representative of the variation in buck:doe ratios across the hunting district. In this situation, the option exists to use sub-units in the sampling design. In association with a particular trend area, 4 or 5 relatively small, fixed sub-units could be stratified across the hunting district to reflect variation in land ownership and hunting opportunity. A required total sample of 240 does (to provide a 95% confidence interval) would be classified with accompanying fawns and bucks in a proportional allocation among the different subunits. This would form the basis for calculating a buck:doe ratio from the pooled sample gathered across the hunting district. However, if this approach is used, the buck:doe ratio for the primary trend area should be reported separately from the buck:doe ratio derived from the pooled sample.

During the spring "green up window" all trend areas will be flown with full coverage methods to maximize the count and classification of deer. Replicate surveys will not be flown on trend areas. The timing of spring surveys is critical and will depend on familiarity of the local biologist with each trend area.

Priority for Survey Completion

A total of 13 census areas and 67 trend areas represents a major step toward improving the quality of data collected on mule deer populations in Montana. Applying these monitoring guidelines will require a substantial amount of cooperation among our personnel to provide the time, money and aircraft services necessary to accomplish this task each year. Both efforts (census and trend) are important and complimentary components in the overall monitoring program. Census areas provide precise data on population status for computer models and represent the best view of statewide changes in deer populations. Trend areas provide less intensive data at more numerous localities that represent the "nuts and bolts" for making regional deer management decisions.

Completion of post season and spring surveys on each census and trend area is our primary objective each year. However, past experience indicates that circumstances will occasionally prevent this from happening. For that reason, it is recommended that census areas receive priority for completion so that 5, 10, and 20 years into the future, complete data sets will be available for these mule deer populations occupying representative environments of statewide importance.

Establishing Size and Boundaries for Census and Trend Areas

Selecting the size and boundaries for both types of survey areas is critical to minimizing the movement of deer in and out of the survey area during and between sampling periods. Mule deer display strong fidelity in their use of specific areas including those used during early spring. However, populations that have been the subject of telemetry studies of distribution should receive priority in selection of census and trend areas. Different considerations influence the size and boundaries of survey areas among the major environments.

Prairie/Breaks - Mule deer occupying prairie or timbered breaks/environments primarily display resident or short-distant migration patterns. These populations are distributed at relatively low density across large expanses of habitat. Therefore, size of the survey area should approximate an area of 75-100 mile^2 to contain required sample sizes at population lows. When selecting a census or trend area, it is important to include a large piece of rugged terrain including springs, seeps or other moist sites in the central portion of the survey area. The perimeter should be situated in relatively flat terrain with some creek bottoms that may be used only during peak populations. This arrangement will not only minimize movement of deer in and out of the survey area; it will also provide improved detection of population increases and decreases based on differential use of these flatter areas. Inclusion of only rugged terrain in the survey area may indicate changes in population size of a much smaller magnitude than across the broader area.

Northwest Montane Forest, Mountain Foothill, Prairie/Mountain Foothill, and Southern Mountains - In these mountain environments, the census or trend area should represent an ecologically complete unit of winter range occupied by a particular population of migratory mule deer. Boundaries at upper and lower elevations will vary from year to year, particularly during post season surveys, depending on snow depth and deer distribution. During post season and spring surveys, we recommend that aerial coverage extend or adjust to "runout" of deer at both high and low elevations. This will account for subtle differences in distribution between years and between bucks and does. Lateral boundaries should represent areas that are essentially devoid of deer during winter/spring and represent discontinuities between adjacent winter ranges. Size of a census area or trend area in mountain environments will vary in size from 10-50 miles^2 depending on the above parameters.

Flight Patterns

More effort is needed to standardize flight patterns and sampling methods used on aerial surveys. A high level of survey efficiency and consistency can only be obtained by a team effort between a competent pilot experienced in wildlife survey and an enthusiastic, air-worthy observer. The same type of aircraft should be used across years to minimize sampling variation.

The term full-coverage survey is frequently used in these guidelines. It means just that; to cover the entire survey area in as complete a manner as possible, regardless of terrain and cover characteristics. During each full coverage survey of a census or trend area, the pilot/observer team should have a goal of counting and/or classifying the maximum number of deer in relation to the total number that may be present. An enthusiastic and somewhat competitive attitude among the pilot and observer will provide a consistently high quality data set through time. Optimum observability of deer and accurate sex and age classification coincide with time periods when deer are most active. These times are usually three-hour periods after sunrise and before sunset.

Accurate counting and classification of sex and age classes is most efficient when the pilot presents the observer with a low-level, broadside view of all members of the group. Classification is most difficult when the pilot approaches a fleeing deer group from behind and passes directly over the animals. Optimal positioning of the aircraft is more difficult with a supercub in some habitats, and can also be a problem on helicopter surveys in rugged, heavily timbered terrain. After a group is counted and classified, the aircraft should turn the group back toward the area already surveyed to avoid double counting. This is most important on areas with a high density of deer. Some pilot/observer teams will enhance efficiency by dividing the counting and classification workload. Often the pilot can most easily tabulate total numbers in the group while the observer does the classifying. Ideally, post-season surveys are completed with either total snow cover or total bare ground as opposed to patchy snow conditions. Bare ground and the early greenup should prevail during spring surveys.

However, by waiting for ideal conditions, the window of opportunity may be lost. Most important is to safely complete the survey in a consistent manner each year.

Helicopter - In mountain environments, helicopters are used almost exclusively for most post season and spring surveys on census and trend areas. The ideal flight pattern should slowly weave uphill through one aspect of a drainage so that the observer views that entire slope from the bottom to the drainage head. Then, the helicopter should cross to the top of the opposing aspect and weave slowly downhill and enter the bottom of the next drainage and repeat. This pattern is better than flying contours across drainages and will reduce the chances of double-counting groups of deer. However, when using piston-powered helicopters, in rugged, steep terrain it may be necessary to partition the survey area into segments including more than one drainage. Then each segment can be flown from top to bottom along contour lines before moving on to the next segment.

Piper Supercub - In prairie environments, Piper Supercubs can be effectively used for post season and spring surveys. For post season surveys in the timbered breaks, helicopters are recommended for accurate classification of bucks. Supercubs are preferred for spring surveys in the timbered breaks because they provide a lower level of disturbance when counting deer on open ridge tops adjacent to timbered areas.

The ideal supercub flight pattern over the gentle to moderate relief associated with prairie/breaks environments is to weave uphill through one aspect of a drainage to the drainage head and then weave downhill through the opposing aspect. In some areas of high relief terrain, it may be necessary to fly contours from bottom to top across the drainage in this segment. Care should be taken to avoid the higher probability of double-counting deer when using this method.

Sample Size

If census and trend areas are large enough (75-100 mile^2 for resident deer in prairie/breaks, 10-50 mile^2 to include ecologically complete winter range for migratory deer) in representative habitats, sample size should not be a problem. However, the survey area should include a minimum of 100 adult females and accompanying fawns and bucks during a population low.

During post season surveys on trend areas, the minimum number classified should approach 50% of the number of deer tabulated during the previous spring survey. A 95% confidence interval for ratios in a specific population may require a maximum of 240 does classified with accompanying fawns and bucks.

Description of Census Areas and Trend Areas

A baseline area description of the size, boundaries and important environmental characteristics of each census and trend area is needed in the near future. This effort should be coordinated among the regions so that consistent and comparable descriptions can be developed statewide. Include such attributes as census/trend area boundaries, seasonal ranges of deer (if known), major topographic features, rivers, creeks, primary vegetation types (conifer timber, shrub-grass rangeland, riparian areas, irrigated/nonirrigated agricultural lands), highways, towns and hunting unit boundaries. This entire description process could be developed and coordinated through the FWP GIS/arc-view group. With the current technology available to us, these GIS/arc-view maps of census and trend areas could serve as a template for displaying to the public and FWP Commission the deer data and its relationships to survey area environments.

In conjunction with the detailed deer population monitoring associated with census areas, the Habitat Bureau should be consulted on these baseline descriptions as well as long-term monitoring of various habitat features, weather patterns, and land uses on these same areas. A joint effort in monitoring deer populations and their environments will best serve the long-term utility of these databases.

Specific Guidelines for Important Environments

Prairie/Breaks

Number and Location of Survey Areas - The 7 census areas in the prairie/breaks are the most numerous of any environment in the state (Fig. 1). Not only is the prairie/breaks the largest in geographic size, it also contains significant spatial and temporal variation in mule deer population dynamics and environmental characteristics. For similar reasons, the 35 trend areas in this type represent half of the total for the entire state (Fig. 1).

Post Season Survey Time of Year - December 1-January 15 - After hunting season and before antler shedding, each census area receives a full coverage count/classification survey and each trend area receives a classification sample flight (see Census Area, Trend Area sections).

Aircraft:	Supercub, with the exception that a helicopter is necessary in the timbered breaks to accurately classify antlered bucks.
Time of Day:	Early morning and evening when deer are active.
	All day when using a helicopter.

Weather:	Optimal is clear skies, minimal wind
What to Record:	Describe survey conditions such as cloud cover, temperature, wind, snow depth/coverage, flight time, and deer behavior. Location of deer groups by drainage and elevation or GPS. For each group, record total number, no. does, no. fawns, no. bucks by yearling and older; antler points by side if possible. From this can be computed: total mule deer observed - fawns:100 does, bucks:100 does. Observation of other species (other ungulates, coyotes, etc.)

Spring Survey Time of Year - March 15 - April 30. Timing depends on phenology of early spring plant growth which varies from year to year. A two-week time period is available when deer are readily observable when using the first flush of green vegetation, after which groups scatter as deer begin using timbered habitats. During this narrow window, each census area will receive 3 full coverage surveys including the primary count/classification flight followed by 2 replicate flights to count deer (see Census Areas section for details). Each trend area will receive one full coverage count/classification flight (see Trend Areas Section).

Aircraft:	Supercub except that a helicopter is advantageous in some habitats
Time of Day:	Daylight to 9:00 a.m. or until deer begin bedding down. Evening flights usually begin about 5:00 p.m. as deer become active.
Weather:	Optimal is clear skies, minimal wind
What to Record:	Describe survey conditions such as cloud cover, temperature, wind, flight time, and deer behavior. Location of deer groups by drainages and elevation or GPS.

For each group, record total numbers, no. adults, no. fawns. From this can be computed: total mule deer observed, Fawns:100 adults.

Observation of other species (other ungulates, coyotes, etc).

Mountain Foothill, Prairie/Mountain Foothill and Southern Mountains

Number and Location of Survey Areas - In these mountain foothill environments located east and west of the continental divide, 5 census areas and 25 trend areas have been selected to monitor variation in mule deer population dynamics (Fig. 1).

Post Season Survey Time of Year - December 10 - January 10. Avoiding a 10-day period after the end of the hunting season provides opportunity for deer to move onto winter ranges. If surveys are conducted closer to January 10, expect more problems with antler shedding. Each census area receives a full coverage count/classification survey and each trend area receives a classification sample flight (see sections on Census Areas and Trend Areas for details).

Aircraft:	Helicopter
Time of Day:	Surveys can be conducted all day.
Weather:	Optimal is clear skies, minimal wind on open non-timbered winter ranges. Thin overcast skies producing flat, bright light and calm air are optimal on moderately timbered winter ranges.
What to Record:	Describe survey conditions such as cloud cover, temperature, wind, snow depth/cover, flight time and deer behavior. Location of deer groups by drainage and elevation or GPS. For each group, record total number, no. does, no. fawns, no. bucks by yearling and older and by antler point class. Observations of other species (other ungulates, coyotes and mountain lions).

Spring Survey Time of Year - March 15 – April 30 -Timing depends on phenology of early spring plant growth which varies from year to year. A 2-3 week time period is available when deer are readily observable when using the first flush of green vegetation; after which groups scatter as deer begin using timbered habitats at higher elevations. During this narrow window, each census area will receive 3 full coverage surveys including the primary count/classification flight followed by 2 replicate flights to count deer (see Census Areas section for details). Each trend area will receive one full coverage count/classification flight (see Trend Areas section for details).

Aircraft:	Helicopter
Time of Day:	Surveys can be conducted all day long.
Weather:	Optimal is clear skies, minimal wind on open, non-timbered winter ranges. Thin overcast skies producing flat, bright light and calm air are optimal on moderately timbered winter ranges.
What to Record:	Describe survey conditions, such as cloud cover, temperature, wind, flight time, and deer behavior. Location of deer groups by drainage and elevation or GPS. For each group, record total numbers, no. adults, no. fawns. From this can be computed: total mule deer observed - fawns:100 adults. Observations of other species (other ungulates, coyotes, mountain lions).

Northwest Montane Forest

Number and Location of Survey Areas -In the northwest montane forest, west of the Continental Divide, 1 census area and 7 trend areas have been selected to monitor mule deer populations (Fig. 1).

Post Season Survey Time of Year - December 1 - January 10. If surveys are conducted closer to January 10, expect more problems with antler shedding. The census area will receive a complete coverage count/classification survey and each trend area receives a classification sample flight (see sections on Census Areas and Trend Areas for details).

Aircraft:	Helicopter
Time of Day:	In northwest montane forests, early morning and evening surveys are recommended to avoid the mid-day bedding period when deer use dense timbered cover.
Weather:	Optimal is thin overcast skies producing flat, bright light and calm air on moderate-densely timbered winter ranges.
What to Record:	Describe survey conditions such as cloud cover, temperature, wind, snow depth/cover, flight time and deer behavior. Location of deer groups by drainage and elevation or GPS. For each group, record total number, no. does, no. fawns, no. bucks by yearling and older and by antler point class. From this can be computed: number mule deer observed - fawns:100 does, bucks:100 does. Observations of other species (other ungulates, coyotes, mountain lions).

Spring Survey Time of Year - March 15 – April 30. Timing depends on phenology of early spring plant growth, which varies from year to year. During a 2-3 week time period, deer are more observable when using the first flush of green vegetation. During this narrow window, the census area will receive 3 full coverage surveys including the primary count/classification flight followed by 2 replicate flights to count deer (see Census Areas section for details). Each trend area will receive one full coverage count/classification flight (see Trend Areas section for details).

Aircraft:	Helicopter
Time of Day:	Early morning and evening surveys are recommended to avoid the mid-day bedding period when deer use dense timbered cover.
Weather:	Optimal is thin overcast skies producing flat, bright light and calm air on moderate-densely timbered winter ranges.
What to Record:	Describe survey conditions such as cloud cover, temperature, wind, flight time and deer behavior.

Location of deer groups by drainage and elevation or GPS.

For each group, record total numbers, no. of adults, no. of fawns. From this can be computed: total number mule deer observed - fawns:100 adults.

Observation of other species (other ungulates, coyotes, mountain lions).

POPULATION MODELING

In 1996, Montana Fish, Wildlife and Parks (FWP) initiated a process to improve the management of mule deer populations throughout the state. Using concepts derived from adaptive harvest management (AHM), FWP developed a program that more effectively integrates management goals, harvest regulations, and population monitoring. The fourth component of the AHM process involves computer models that predict future population trends. A team of FWP wildlife biologists constructed models for two major mule deer population habitat units – the mountains and the prairies. These models utilized the best available data from field studies on mule deer population dynamics derived from long-term research and management efforts conducted in several areas of Montana.

The two models utilize fawn:doe and buck:doe ratios obtained from post-hunting season surveys as well as total number of deer counted and the fawn:adult ratio from spring surveys. These data are then used to predict mule deer population size and composition during the following spring, given a suite of possible harvest regulations and environmental conditions. The earliest starting point for the model is the spring of the year, after aerial surveys of census areas are completed. Biologists enter data obtained each year into the computer model, and then project the population forward one year. The biologist is thus able to forecast the effects of different hunting regulations and possible weather scenarios and build a matrix of potential outcomes. Modeling can help in selecting a hunting regulation that matches population objectives under a predicted set of environmental conditions. The feedback between annual monitoring and modeling of representative populations should enhance our ability to detect and respond to significant changes in the size and composition of Montana's mule deer populations.

There are three main calculation modules in each model: reproduction, hunting, and natural mortality. For each model, the three modules are briefly described below.

MOUNTAIN POPULATION MODEL

This model is applicable to mule deer in Regions 1, 2, 3, and portions of Regions 4 and 5 in Montana. These regions encompass the northwest montane, mountain/foothill, prairie/mountain foothill, and southern mountain population management units. Fawn production for the current year is initialized from fawn:doe ratios collected in December. These December fawn:doe ratios vary between regions and depend on three input parameters: 1) a general climatic index, 2) an estimate of how severe the previous winter was, and 3) estimates of precipitation patterns during the previous summer. Historical data indicate that the harvest of mule deer varies by population-management units and regions. For each region, annual hunting mortality rates were estimated using the relationships between hunter density and harvest density (number of deer harvested per square mile) in a sample of hunting districts. Harvest densities were developed for both bucks and does under three different harvest regulations. The harvest density was then converted to a harvest rate for each

regulation. For the mountain model, these harvest regulations are:

1. *Restrictive: bucks-only, with no antlerless B-tags*
2. *Standard: bucks-only with low to moderate numbers of antlerless B-tags*
3. *Liberal: 2 weeks either sex, 3 weeks bucks only with moderate-high numbers of antlerless B-tags*

Part of the uncertainty in modeling deer populations is that we do not know how severe the upcoming environmental conditions will be. Telemetry data on mountain mule deer populations from Montana suggest that mortality rates during winter depend on both winter severity and the physical condition of deer as they enter the winter. During summer, physical condition of deer is directly related to the length of time when green, succulent forage is available. In the mountain model, summer conditions are defined as dry, moderate, or lush. Combinations of summer growing season conditions and winter severity (mild, normal, severe) result in predictable variations in mortality rates. While we cannot predict if the next winter will be mild or severe, we can anticipate the magnitude of mortality that might occur at either extreme and how these scenarios would influence population status in the following year under a particular regulation.

PRAIRIE POPULATION MODEL

This model was developed to predict annual changes in mule deer numbers and composition in the prairie/breaks population-management unit encompassing most of eastern Montana. A biologist can forecast the interaction between four different hunting regulations and variation in natural mortality related to summer growing seasons and winter severity to build a matrix of potential outcomes.

Two alternative hypotheses are provided within the model to estimate fawn production. The first hypothesis is based on observed relationships between post-season fawn:doe ratios, temperature, and precipitation. In this case, post-season fawn:doe ratios are estimated from local weather data that include average May temperature (F^o), and the total precipitation in inches from the previous July through April. These weather data strongly correlate with measured estimates of forb production in the Missouri River Breaks.

The second hypothesis for fawn production to December is based on an estimated density-dependent relationship. This relationship predicts expected post-season fawn:doe ratios from the density of does (does:mi^2) in the population during the previous spring. Estimates are given for two general spectrums of deer density. The first spectrum applies to habitats that produce an average density of less than 10 does:mi^2. This often occurs where no agricultural lands are influencing reproduction and survival. If typical densities of deer are rather high ($\geq$10 does:mi^2), then a different equation is used to estimate fawn:doe ratios in the upcoming post-season. This is generally applicable to habitats with a strong agricultural influence.

Historical data indicate that the four FWP regions that encompass the prairie/breaks differ both in numbers of hunters and the density of mule deer harvested, thus a common harvest rate is not applicable to the entire area. Therefore, variation in annual hunting mortality rates in a sample of districts from each region was estimated using the relationship between hunter density and harvest density.

For each region, harvest densities (number of deer harvested per mi^2) were developed for both bucks and does under four different harvest regulations. Harvest density was then converted to a harvest rate. For the prairie population model, these regulations are:

1. *Restrictive: bucks-only, no antlerless B-tags*
2. *Standard #1: either sex with limited numbers or no antlerless B-tags*
3. *Standard #2: either sex with moderate numbers of antlerless B-tags*
4. *Liberal: either sex with high numbers of antlerless B-tags*

Winter mortality rates were developed for three classes of severity using telemetry data from the Missouri River Breaks. These mortality rates are applied to the predicted post-season numbers to estimate population parameters in the spring.

STATUS OF MODEL DEVELOPMENT

Initial development of both models was completed in February 2000. Run-time copies have been distributed to 1 or 2 biologists in each region for testing with monitoring data during the ensuing year. It is recommended that the first annual review of model performance should occur during early summer of 2001. At that time, any necessary changes in model assumptions or calculations can be determined in a coordinated manner. Computer program editing will be conducted by Ray Mule', Shawn Stewart, and Dave Pac, who will provide expertise on the various population management units.

DEFINITIONS

ANTLERED BUCK: A deer with an antler or antlers at least four inches in length measured from the top of the skull.

ANTLERLESS: A deer without antlers or with antlers less than four inches in length measured from the top of the skull.

BUCK:DOE RATIO: The number of adult bucks and adult does observed during post-season surveys expressed as a ratio of number adult bucks:100 adult does. Yearling and older deer are counted as adults.

DEER A LICENSE: Hunters may purchase one deer A license each year. The license is valid for the species and sex of deer and time period applicable to the general season. The deer A license is also valid during the archery-only season if the hunter has also purchased a bow and arrow license.

DEER B LICENSE: A class of license usually designated as valid for antlerless deer (either mule deer or whitetail). A hunter may hold more than one B license, and it is usually held as an additional license to the deer A license.

EITHER SPECIES: Mule deer or white-tailed deer.

FOUR POINT BUCK: Any deer having at least one antler with four or more points not counting the brow point or tine. A point is an antler projection that is at least one inch long. Hunter harvest survey statistics record all points of an antler. Therefore, a buck with four points on one antler and a brow tine will be recorded as having five points in the hunter harvest survey statistics.

FWP GAME DAMAGE POLICY: A policy which describes those actions taken by FWP in response to a complaint of game damage by a landowner (Appendix I).

HUNTER HARVEST SURVEY STATISTICS: A telephone survey of purchasers of Montana hunting licenses (resident and nonresident), conducted by FWP on an annual basis. Questions are designed to determine sex and age composition of the harvest, total number of animals harvested, numbers of hunters afield, number of days of hunting recreation provided, hunter success and distribution of the harvest by hunting district or region during the hunting season.

HUNTING OPPORTUNITY: A combination of circumstances and options that makes the experience of hunting readily available. Opportunity is commensurate with the ability of an individual to participate and to choose situations that are personally rewarding.

LONG TERM (at least 10 years of data): Some survey locations have been monitored for a period of ten years or more, while others have shorter data sets. The intent of long term is to define a range in population size that corresponds to expected variation in numbers of deer. Optimum population size in relation to habitat capability and landowner tolerance can then be determined.

MULTIPLE B LICENSES: A hunter may hold (purchase) more than one B license in a license year.

OVER-THE-COUNTER LICENSES: B licenses (may be limited or not limited in number) that can be purchased from a license agent or FWP without a drawing.

POPULATION MANAGEMENT UNIT: A group of hunting districts with similar environments and deer population characteristics.

POST-SEASON SURVEY: Refers to a survey conducted after the hunting season and before deer shed their antlers (December – early January).

RECRUITMENT: Fawns that survive the first year and enter the adult segment of the population; expressed as the ratio of fawns per 100 adults observed in spring (March and April).

APPENDIX I

WILDLIFE 12.9.801

Sub-Chapter 8

Damage Hunts

12.9.801 DAMAGE HUNTS (1) Damage hunts are carried out according to the following policies and procedures:

(a) In January, the department requests the commission to tentatively approve a specified number of antlerless deer, antlerless elk and doe:fawn antelope licenses for potential game damage occurring between August 1 and February 28.

(b) If a special damage season is determined by the regional supervisor to be necessary prior to the general hunting season, the supervisor must obtain approval of the commissioner in whose district the special game damage season is proposed prior to implementing the season. If the commissioner is not available, then approval will be requested from the chairman of the commission, or in his absence, any other commissioner. A random list of applicants on file for that district in special licensing will be requested. The list will include all those applications processed to date and on the computer file. If an applicant list is not available for the district, the regional application list for that species will be used. Hunters selected by the region to participate in the special damage season will not be allowed to hunt with the special damage license/permit during the general season if unsuccessful during the early damage hunt. These hunters will be in addition to the general season permit quota. After the August drawing, successful applicants will be used before the general season and will not be in addition to the general season permit quota.

(c) Current license/permit holders successful in the general season drawings will be used for damage seasons conducted during the general hunting season. They will not be in addition to the general season permit quota.

(d) Deer and antelope. At the option of the regional supervisor, the list of unsuccessful applicants for the district or local drawing/first come, first served method will be utilized for damage seasons to be conducted after the general hunting season. These hunters will be in addition to the general season permit quota. Licenses will be available from the local license dealer for all deer damage seasons in which A-4 or B-8 licenses are sold.

(e) Elk. A roster of hunters to participate in elk damage season conducted after the general hunting season will be developed according to the following priority: First, holders of A-7 elk licenses, valid in that portion of the district, who did not fill their A-7 elk license during the period when it was valid; second, unsuccessful applicants for A-7 elk licenses in that portion of the districts; third, unsuccessful

applicants for a permit in the district; fourth, unsuccessful applicants for permits in districts immediately adjacent to the district or unsuccessful applicants for permits in the region; and finally, holders of permits, valid in the district, who did not fill their permit during the general season. If an applicant list is not available for that species, a local drawing or a first come, first served method of distribution will be used.

(2) Eligible licenses. Unless stated otherwise, participants in a damage hunt must possess a valid unused license and damage hunt permit for the following species:

(a) For deer, the hunter may use valid unused class AAA, A-3, A-4, B-7, B-8, B-10, B-11 or senior, disabled, or youth deer licenses, or special deer damage licenses. The holder of a class B-11 license may use the damage hunt permit only on the landowner sponsor's property;

(b) For elk, the hunter may use valid unused Class AAA, A-5, senior, disabled, or youth or B-10 licenses. The holder of a class A-7 elk license may use the damage hunt permit only in the district in which the A-7 elk license is valid;

(i) a person who is contacted by the department for the purpose of a damage hunt may waive the opportunity to participate, but may not be considered again until all other interested persons have been contacted; and

(ii) any person who receives an elk permit in the initial drawing may not receive a second permit in the same license year.

(3) With the exception of deer and antelope, no person may take more than one big game animal of any species during this license year.

(4) The 10% nonresident limitation is not applicable to damage hunts.

(5) No fee is necessary for a special permit issued under these procedures. (History: Sec. 87-1-225 MCA: IMP Sec. 87-1-225 MCA; NEW, 1991 MAR p. 815, Eff. 5/31/91.)

12.9.802 MANAGEMENT SEASONS (1) When an additional harvest is required to fulfill the department's responsibility to manage game populations according to available habitat, management seasons may be initiated.

(2) By law, the department is required to respond to all big game damage complaints. General hunting seasons are the primary tool to deal with animals causing or having the potential to cause game damage.

(3) The department investigates damage complaints as soon as possible, and within 48 hours of the filing of the complaint. If the department person who received the complaint is unavailable to respond within 48 hours, he will immediately refer the complaint to the nearest department employee who can respond within a 48-hour period. Exceptions may be made if complainant is agreeable to a

longer waiting period;

(4) The department fish, wildlife and parks investigates all damage complaints under this policy with the exception of (5). A phone call or on-site visit constitutes an immediate response under this provision.

(5) Damage caused by nongame, furbearing, or federally listed threatened and endangered species is not covered by this policy, but is addressed on a case-by-case basis.

(6) In response to legitimate damage complaints, a regional supervisor may address the problem in the following ways:

(a) Special seasons. Special seasons may be used under the following conditions:

(i) during the time period of August through February;

(ii) when reasonable hunter access is available to allow for harvest of problem animals;

(iii) when there are enough animals involved to justify public hunting; and

(iv) when the game damage is a recurring problem, and animals are normally unavailable during the general hunting season.

(b) Herding. As a temporary measure, herding may be employed;

(c) Dispersal. A variety of animal dispersal methods may be employed, such as airplanes, snowmobiles, cracker shells and scareguns;

(d) Repellents. Bloodmeal and other repellents may be employed as temporary solutions;

(e) Fencing. If the problem is chronic and involves haystacks, various fencing options may be utilized:

(i) Permanent stackyards. In cases where records show haystack damage occurs annually, stackyards may be used as a permanent solution. The department will furnish the property owner with posts and wire. It is the landowner's responsibility to construct the fence and to provide proper maintenance. In situations where stackyards enclosed several acres, particularly those surrounding round bales, permanent stackyards may not be the most desirable treatment of the problem;

(ii) Electric fencing. In situations where a large area is being used for a stackyard, such as round bale storage, electric fencing may be the most feasible solution. The department will provide the charger and fencing materials. On the initial installation, the department will assist in setting up the fence. The storage and care of this equipment is the responsibility of the rancher, and with proper care, materials should last three years. If game damage does not recur in succeeding winters, the department will pick up the charger for use in other areas;

(iii) Snowfence. If a haystack has straight sides, 4 or 6 ft. snowfence works well, or in the case of elk, 8 ft. panels may be used. It is reasonable to assume the snowfence or panels will last for a minimum of three winters if properly cared for. Rolling and storage are the rancher's responsibility. Depending upon the size of the area and availability, the department will furnish the snowfence or panels, and the property owner will be responsible to put it up, take it down, and provide maintenance;

(iv) It will be the responsibility of the landowner to store materials furnished by the department in a manner consistent with proper care, with reasonable wear expected. A signed agreement with the landowner will record any planned actions and serve as a receipt for any materials that are provided. These agreements will be sent to the individuals. Fence fabric shall be returned to the department when it is no long needed for protection from wildlife damage. Materials will be replenished when reasonable wear makes them ineffective;

(f) Kill permits. A kill permit may be considered to be the best immediate solution and may be activated without first exhausting any of the previously mentioned methods. Authorization for kill permits are issued by regional supervisors.

(g) In special situations, netting or mechanical devices may be used to reduce tree damage;

(h) Hunting methods: When rifle hunting poses a threat to the safety and welfare of persons or property, use of archery, shotgun and/or muzzleloader may be used as an alternative.

(7) Denial of assistance. Assistance may be denied or discontinued to a landowner who:

(a) creates or further contributes to game damage problems by not providing sufficient public hunting to aid in reduction of game populations;

(b) imposes other restrictions which prevent adequate harvests; or

(c) refuses reasonable suggestions, actions or remedies offered by the department. The decision to deny or terminate assistance will be made by the regional supervisor. Denial or discontinuance of assistance will be documented with the reasons, history and other pertinent information used to make that decision. A copy of the written decision will be provided to the landowner. The written decision will explain appeal rights.

(8) Appeal process.

(a) A landowner may appeal the denial or discontinuance of assistance to the director of the department. The appeal must be in writing and must contain specific reasons why the regional supervisor's

decision is felt to be erroneous. The appeal must be filed within 10 days following receipt of a denial or discontinuance determination from the regional supervisor;

(b) The director of the department will review the information used by the regional supervisor in making the initial determination and the reasons cited by the landowner for appealing the decision. At the director's discretion, the commission may be asked to review the appeal and make recommendations for the decision. Following the review, a final decision will be rendered by the director. (History: Sec. 87-1-225 MCA; IMP, Sec. 87-1-225 MCA; NEW, 1991 MAR p. 815, Eff. 5/31/91.)

DEER MANAGEMENT POLICY

MONTANA FISH, WILDLIFE & PARKS COMMISSION
DEER MANAGEMENT POLICY
FEBRUARY 5, 1998

THIS DEER MANAGEMENT POLICY is adopted by the Montana Fish, Wildlife & Parks Commission to serve as the basis for establishment of deer hunting regulations, including season frameworks and license quotas.

It is the policy of the commission to manage for the long-term welfare of Montana's deer resource and provide a range of recreational opportunities reflecting public expectations, consistent with the ability of the resource to support a sustainable harvest, considering landowner tolerance, and recognizing the dynamic nature of deer populations. In addition, it is the policy of the Commission to emphasize protection and enhancement of mule deer habitats.

There are three components to this deer management policy - management of population numbers, management of the antlered buck segment, and habitat protection and enhancement.

MANAGEMENT OF DEER POPULATION NUMBERS

The Commission recognizes that many factors affect the dynamics of deer populations, and that hunting is just one of those factors. A consistent statewide monitoring program to provide current information on deer population numbers, trends, recruitment and harvest is a critical component of this management policy.

This policy recognizes management must be tailored to the specific needs of mule deer and white-tailed deer.

It is the policy of the Commission that deer hunting seasons be designed to harvest a sustainable surplus of animals of both sexes when fawn production, recruitment, adult mortality and population numbers are within target ranges. This will include either sex hunting opportunity where consistent with population dynamics and additional antlerless deer tags where appropriate and necessary to harvest sufficient number of animals.

It is the policy of the Commission to restrict harvest of antlerless deer when monitoring data show low reproduction or recruitment, and when populations are below target ranges, in order to facilitate recovery of population numbers. Where necessary to achieve population objectives, harvest of antlerless deer may be more restrictive on public land than private land.

When populations exceed normal ranges and are so high as to risk damage to habitat or exceed landowner tolerance, harvest of antlerless deer will be designed to control population numbers within the target range.

MANAGEMENT OF THE ANTLERED BUCK SEGMENT

The majority of hunting districts are to have seasons designed to provide maximum hunting opportunity and harvest of mule deer and white-tailed deer bucks consistent with the long-term welfare of the deer resource. In most cases this will be the standard five-week antlered buck (including either sex as appropriate) season ending the Sunday after Thanksgiving.

White-tailed deer are not as vulnerable to harvest as mule deer due to behavioral characteristics, preference for thickly vegetated habitat, and prevalence in river bottoms where property ownership is predominantly private. Therefore, it is unlikely that there will be a need to restrict further the harvest of white-tailed deer bucks.

Mule deer prefer more open habitats and are more vulnerable to harvest than white-tailed deer. The Commission believes that because habitat pressures and numbers of hunters are increasing, there is a danger in some hunting districts of harvesting such a high percentage of bucks that age structure of the buck segment is minimal and consequently reproductive potential and genetic quality of the herd are at risk. It is the policy of the Commission, therefore, to implement season types designed to restrict the harvest of mule deer bucks where harvest during the unrestricted five-week season results in a survival of less then 30 percent of the bucks. Where possible, the preferred five-week season will be combined with validation or unlimited permits to increase survival to more than 30 percent in the least restrictive way. Where it is necessary to implement limited entry permits by drawing the objective will be to achieve a survival rate of 40 to 60 percent for bucks. Other season types, such as a shortened season or four-point season, may be continued where already in place or implemented where special circumstances make alternative season types viable.

The Commission considers an annual survival objective of 50%mule deer bucks to provide a reasonable balance between hunting opportunity and quality of the hunting experience, and in regions or deer management units where the survival objective is 50% or more, there is no need for season types designed to restrict further the harvest of bucks.

In some areas of Montana there is a minimal opportunity to harvest an older age mule deer buck due to high harvest rates and minimal survival of bucks to older age classes. Where this is the case, selected hunting districts (or deer management units comprised of several hunting districts) are to be managed for age structure of bucks which will allow an opportunity to harvest an older buck, with a survival objective of no less than 60 percent of the bucks each year. The preferred season type is a standard five-week season with limited entry permits by drawing. Establishment of such special management districts will consider hunter demand,

support by landowners, and the existing opportunity to harvest an older age buck in the region under the general season framework.

HABITAT PROTECTION AND ENHANCEMENT

There are several concerns with respect to mule deer habitat – subdivision of private land (particularly foothill and sagebrush/grassland winter ranges), habitat security on public lands, and some land management practices such as the conversion of sagebrush/grassland. The Habitat Montana program emphasizes "important habitats that are seriously threatened." Mule deer habitats which are primarily the shrub-grassland type, continue to be a priority under this program. In addition, the Commission directs that the department identify opportunities for improving habitat security for mule deer by working with land management agencies, particularly the US Forest Service, Montana Department of Natural Resources & Conservation, and U.S. Bureau of Land Management to develop, with public involvement, timber management plans, and travel plans with appropriate restrictions, including road closures and limitations on the use of off-road vehicles during the hunting season.

BACKGROUND

The Montana Fish, Wildlife & Parks Commission has considered the following factors in the formulation and establishment of this statewide deer management policy:

- Management of deer, particularly mule deer, has been the subject of increasing controversy in the adoption of hunting regulations in recent years.

- Montana Fish, Wildlife & Parks has conducted a survey of deer hunters to compile information on what deer hunters in Montana seek and expect in their deer hunting experience.

- Montana Fish, Wildlife & Parks and the Commission in 1996 conducted a series of "Deer Summits" around the state to review biological data and receive public comment on the issue of deer management.

- Survey results and public comment indicate that for a majority of deer hunters the opportunity to harvest an older age buck is secondary to the opportunity to enjoy the hunting experience and harvest a deer for meat.

- There is strong support among the hunting public to retain the present five-week season framework for the general deer season.

- Public comment indicates that a significant and possibly increasing minority of deer hunters, perhaps 25%, place high value on the opportunity to harvest an older age buck.

- Mule deer numbers are at a low point in the population cycle due to factors of weather and predation which have limited recruitment for several successive years.

- In some areas of the state, environmental changes may work against recovery of mule deer populations to historic levels; these include subdivision of winter ranges, loss or conversion of shrub habitats, and predation.

- In some hunting districts harvest of mule deer bucks has been so high that survival beyond 2.5 years is minimal and age structure is, therefore, limited.

- Factors contributing to harvest of high percentage of available bucks include lack of habitat security, ease of access in areas of predominantly public land, and increasing number of hunters.

DISCUSSION

The Commission recognizes that the current downturn in mule deer numbers is the result of poor recruitment for several consecutive years, and that historically mule deer populations have experienced similar cycles. Past experience indicates that mule deer numbers will recover when environmental factors are conducive to higher recruitment rates, and that populations will recover to normal levels in a few years.

The Commission is concerned, however, that changing habitat factors may in the longer term work to the detriment of mule deer. High numbers of elk may limit use of some habitats by mule deer. Conversion of shrub lands to grass favors elk over deer. Agricultural development in valley bottoms has favored white-tailed deer, which show increasing population trends but has not favored mule deer. Subdivision of winter ranges in western Montana is a major concern.

Predation also is a factor. Although mule deer have evolved with predators and under conditions of normal population levels and rates of reproduction, it is unlikely that predators have a controlling effect. Still, coyotes can have a significant impact on both fawns and adults, particularly during harsh winters, and can inhibit recovery when populations are low. Mountain lions prey heavily on deer, and lion populations are at an all time high despite the downturn in deer numbers and increasing lion quotes. Another significant concern related to predators and their role in limiting mule deer numbers in the western two-thirds of Montana is wolf recovery. Wolf numbers are expected to increase rapidly as introduced populations fill new habitat, and until delisting there is no option for management of wolves.

Neighboring states have experienced long-term declines in mule deer not yet observed in Montana. Recognizing the habitat pressures working against mule deer, there is reason to

anticipate a long-term decline that may not be able to support traditional levels of hunting pressure in at least some areas.

The Commission is also concerned that in some hunting districts, harvest of mule deer bucks is high year after year, with few bucks surviving to 2.5 years and virtually none reaching 3.5 years. Although the biological implications of such high harvest rates on a continuing basis are arguable, the commission feels that it would be irresponsible to allow the rate of harvest to continue to increase, and that prudence dictates a goal of limiting the harvest percentage to a maximum designed to result in at least minimal age structure. At a survival rate of 30 percent, just one buck in ten will achieve an age of 3.5 years, and less than one in 100 will reach 5.5 years.

There are also signs that hunter expectations are changing as well. Although the majority of deer hunters in Montana consider the opportunity to take an older age buck to be of less importance, there is a significant and presumably growing element that places a high value on age structure and the opportunity to harvest an older age buck. In 1997, there were 3,446 applicants for 825 available permits in limited entry mule deer buck areas.

The management policy is designed to provide the flexibility to deal with changing conditions over both the short and the long term, and to provide a rational basis for deer management recognizing the health of the resource first and foremost, the range of public expectations for recreational opportunities and concerns of landowners.

Appendix Table 1. Description of mule deer aerial survey areas.

ID Number	Survey Area Name	Survey Type	Responsible Biologist	Aircraft Type	Hunting District	Area (mi^2) Covered	Population Management Unit
1.01	Galton Range	Trend	Thier	Hughes 500	101	48	NW Montane
1.02	Koocanusa	Trend	Thier	Hughes 500	101	46	NW Montane
1.03	Horse Range	Census	Brown	Hughes 500	100	10	NW Montane
1.04	Fisher River	Trend	Brown	Hughes 500	103	30	NW Montane
1.05	Cougar Peak	Trend	Sterling	Hughes 500	121	31	NW Montane
2.01	Dry Creek	Trend	Henderson	Bell 47 Soloy	202	35	NW Montane
2.02	BC-WMA	Trend	Thompson	Bell 47 Soloy	285	35	NW Montane
2.03	Mineral Hill	Trend	Henderson	Bell 47 Soloy	281	30	NW Montane
2.04	Murray-Douglas	Census	Thompson	Bell 47 Soloy	292	20	Mt/Foothill
2.05	Clark Fork Face	Census	Thompson	Bell 47 Soloy	292	32	Mt.Foothill
2.06	East Garnets	Trend	Hook	Hughes 500	291	80	Mt/Foothill
2.07	Rock Creek	Trend	Hook	Hughes 500	216	40	Mt/Foothill
2.08	Antelope Hills	Trend	Hook	Hughes 500	210	40	Mt/Foothill
2.09	Sapphires	Trend	Nielsen	Bell Soloy	261/270	113	Mt/Foothill
3.01	Sieben/Grady	Trend	Joslin	Hughes 500	339/343	95	Mt/Foothill
3.02	Big Belts	Trend	Carlsen	Hughes 500	392	90	Mt/Foothill
3.03	Limestone Hills	Trend	Carlsen	Hughes 500	380	150	Mt/Foothill
3.04	High Rye	Trend	Fager	Supercub	341	60	Mt/Foothill
3.05	Fleecer	Trend	Fager	Supercub	319	45	Mt/Foothill
3.06	Highlands	Trend	Fager	Supercub	340	60	Mt/Foothill
3.07	Pioneers	Trend	Hammond	Jet Ranger	331	16	Mt/Foothill
3.08	Tobacco Roots	Trend	Brannon	Supercub	320	60	Mt/Foothill
3.09	Sweetwater Hills	Census	Brannon	Supercub	326	60	Mt/Foothill
3.10	Ashbough	Trend	Brannon	Supercub	325	80	Mt/Foothill
3.11	Little Sheep/ Big Sheep	Trend	Hammond	Jet Ranger	300/302	40	Mt/Foothill
3.12	Robb/Ledford	Trend	Brannon	Supercub	324	60	Mt/Foothill
3.13	Northwest Slope	Census	Pac	Jet Ranger	312	19	Mt/Foothill
3.14	Brackett Creek	Trend	Pac	Jet Ranger	393	65	Mt/Foothill
3.15	Madison Face	Trend	Alt	Jet Ranger	360/362	100	Mt/Foothill
3.16	Yellowstone River	Trend	Lemke	Hughes 500	313/314	35	Mt/Foothill
4.01	Kevin Rims	Trend	Olson	Supercub	403	25	Prairie/Breaks
4.02	Sweetgrass Hills	Trend	Olson	Hughes 500	401	60	Prairie/Breaks
4.03	Marias River	Trend	Olson	Supercub	406	69	Prairie/Breaks
4.04	RMEF-North	Trend	Olson	Hughes 500	441	100	Prairie/Mt. Foothill
4.05	Pondera	Trend	Olson	Supercub	400	35	Prairie/Breaks
4.06	Teton River	Trend	Olson	Supercub	404	75	Prairie/Breaks
4.07	Missouri River	Census	DuBois	Supercub	405	90	Prairie/Breaks
4.08	Smith River	Trend	DuBois	Jet Ranger	413	80	Prairie/Mt. Foothill
4.09	Judith River	Census	Litchfield	Husky	418		Prairie/Mt. Foothill

Appendix Table 1 Continued.

ID Number	Survey Area Name	Survey Type	Responsible Biologist	Aircraft Type	Hunting District	Area (mi^2) Covered	Population Management Unit
4.10	Coffee/Arrow	Trend	Stivers	Husky	426	42	Prairie/Breaks
4.11	Sage/Indian	Trend	Stivers	Husky	419	30	Prairie/Breaks
4.12	Missouri Breaks	Trend	Stivers	Husky	410	105	Prairie/Breaks
5.01	Big Snowy	Trend	Newell	Jet Ranger	511	71	Prairie/Breaks
5.02	Deadmans Basin	Trend	Newell	Supercub	511	22	Prairie/Breaks
5.03	Adolph	Census	Newell	Supercub	530	69	Prairie/Breaks
5.04	Basin Creek	Trend	Simmons	Supercub	580	10	Prairie/Mt. Foothill
5.05	Grosfield	Trend	Simmons	Supercub	580	88	Prairie/Mt. Foothill
5.06	Cherry Creek	Trend	Simmons	Supercub	570	32	Prairie/Breaks
5.07	Yellowstone Breaks	Trend	Simmons	Supercub	570	49	Prairie/Breaks
5.08	Big Coulee	Trend	Newell	Supercub	500	100	Prairie/Breaks
5.09	Majerus	Trend	Newell	Supercub	590	55	Prairie/Breaks
5.10	Green Mountain	Trend	Simmons	Jet Ranger	560	28	Southern Mtns.
5.11	Magpie	Census	Stewart	Jet Ranger	575	59	Prairie/Breaks
5.12	Sheep Mountain	Trend	Stewart	Jet Ranger	520	10	Southern Mtns.
5.13	Dry Creek	Trend	Stewart	Jet Ranger	502	45	Prairie/Breaks
5.14	Sykes Ridge	Trend	Stewart	Jet Ranger	510	51	Southern Mtns.
6.01	Battle Creek	Trend	Rosgaard	Bilanca Scout	600	43	Prairie/Breaks
6.02	Warrick-IX	Census	Rosgaard	Bilanca Scout	690	97	Prairie/Breaks
6.03	Al's Creek	Trend	Rosgaard	Bilanca Scout	680	65	Prairie/Breaks
6.04	Nichols Coulee	Trend	Sullivan	Bilanca Scout	623	68	Prairie/Breaks
6.05	Cottonwood Creek	Trend	Sullivan	Bilanca Scout	611	44	Prairie/Breaks
6.06	Saco Hills	Trend	Sullivan	Bilanca Scout	620	56	Prairie/Breaks
6.07	Bitter Creek	Census	Gunderson	Supercub	670	105	Prairie/Breaks
6.08	Willow Creek	Trend	Gunderson	Supercub	630/631	127	Prairie/Breaks
6.09	Sand Arroyo	Trend	Gunderson	Supercub	652	50	Prairie/Breaks
6.10	Weldon	Trend	Gunderson	Supercub	650	65	Prairie/Breaks
6.11	Whitetail Creek	Trend	Mule'	Supercub	640	56	Prairie/Breaks
6.12	Culbertson	Trend	Mule'	Supercub	651	62	Prairie/Breaks
7.01	Devils Creek	Trend	Hildebrand	Supercub	700	96	Prairie/Breaks
7.02	Smokey Butte	Trend	Hildebrand	Supercub	700	90	Prairie/Breaks
7.03	Haxby	Trend	Hildebrand	Supercub	700	104	Prairie/Breaks
7.04	Cherry Creek	Census	Burt	Supercub	701	60	Prairie/Breaks
7.05	Hay	Trend	Denson	Supercub	701	60	Prairie/Breaks
7.06	Sarpy	Trend	Denson	Supercub	702	90	Prairie/Breaks
7.07	Harding Ranch	Trend	Burt	Supercub	704/705	115	Prairie/Breaks
7.08	Otter	Census	Risdahl	Supercub	704	55	Prairie/Breaks
7.09	Olive	Trend	Risdahl	Supercub	705		Prairie/Breaks
7.10	Brewer	Trend	Risdahl	Supercub	705	55	Prairie/Breaks
7.11	Horse Creek	Trend	Burt	Supercub	705	128	Prairie/Breaks
7.12	Tie Creek	Trend	Risdahl	Supercub	705	60	Prairie/Breaks