

MANAGEMENT INDICATOR SPECIES

Elk (*Cervus canadensis*)

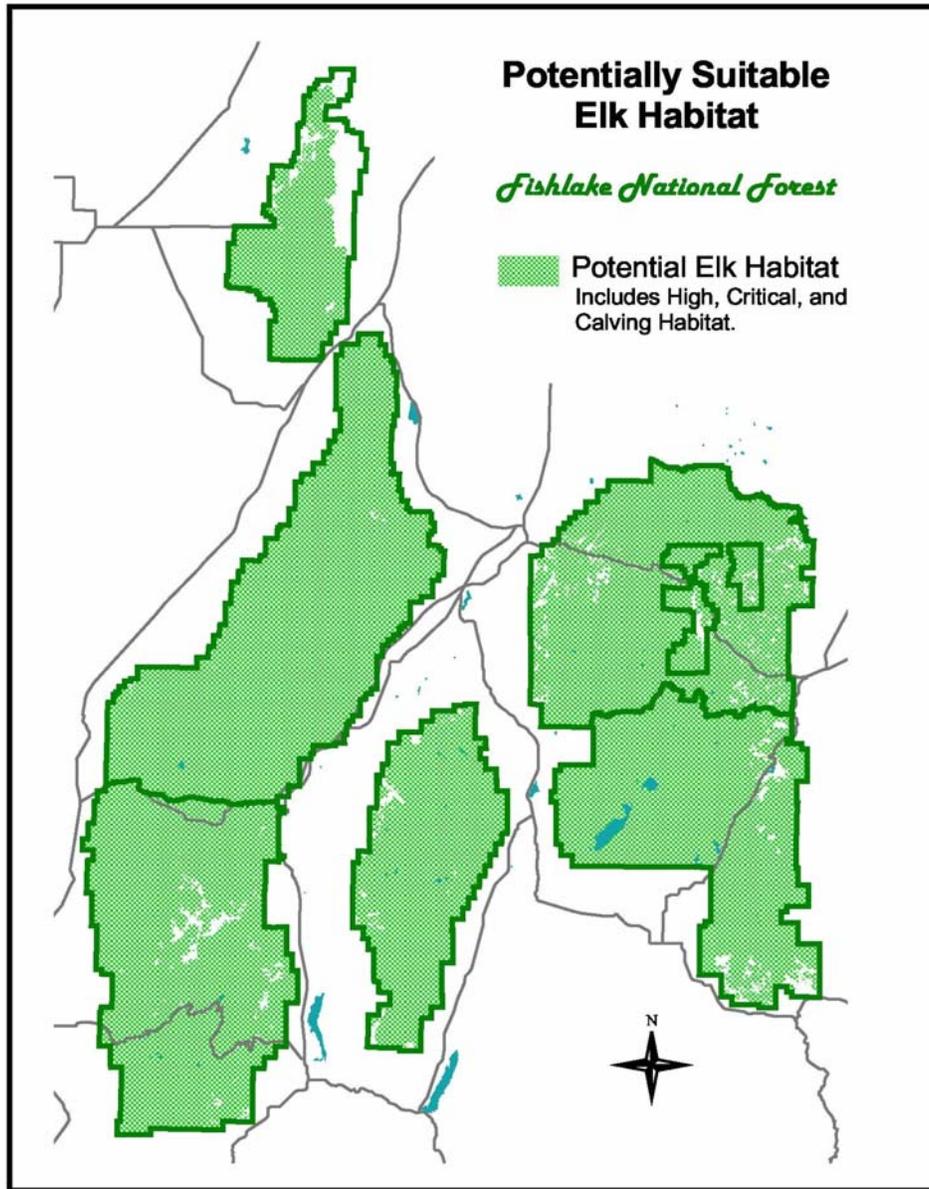
The habitat of elk includes semi-open forest, mountain meadows in the summer, foothills, plains, and valleys. Elk formerly ranged over much of the continent, but are now restricted in distribution. They occur in parts of the western and central United States (Burt and Grossenheider 1976). Roosevelt and Rocky Mountain elk require mature stands of deciduous and coniferous forest habitats. Dense brush understory is used for escape and thermal cover. These habitats are particularly important on south-facing slopes for cover in winter. Roosevelt and Rocky Mountain elk use uneven-aged forest stands that include old growth, herbaceous openings, and water. These elk do not travel far from cover of the forest (Ahlborn 1990).

Elk are herbivorous and feed in riparian areas, meadows, open parklands, and herbaceous and brush stages of forest habitats. They graze and browse, eating grasses, forbs, tender twigs and leaves of shrubs and trees, fungi, some mast, and aquatic vegetation. They forage on the ground, into shrubs, and up to 1.8 m (6 feet) in trees (Ahlborn 1990).

Calving occurs in areas with available water and brushy vegetation that provide dense cover near openings and seclusion from human impacts. The rut occurs from late August to November. The gestation period is about 255 days. Usually one calf is born, but occasionally two, or rarely three. Young are born in secluded areas with good cover. Cows become sexually mature at about two years old. In sedentary herds, female calves usually remain with their mothers to form the cow-calf herds to which they belong throughout their lives. Adult males live separately in bull herds, and join cows only during the rut (Ahlborn 1990).

Humans, mountain lions, and coyotes are the major predators of elk, although black bears, bobcats, and feral dogs probably kill a few (mostly young). Some competition for food and cover may occur between elk and domestic livestock, wild horses, and deer. Populations require seclusion from human interference, protection from poaching, and management to prevent local overpopulation. Proper management of forest and recreational activities can provide these requirements and the mixture of habitats essential to the health of the subspecies (Ahlborn 1990).

Elk habitat occurs across the entire Fishlake National Forest. The map below displays approximately 1,458,049 acres of potentially suitable summer and winter habitat across the forest.

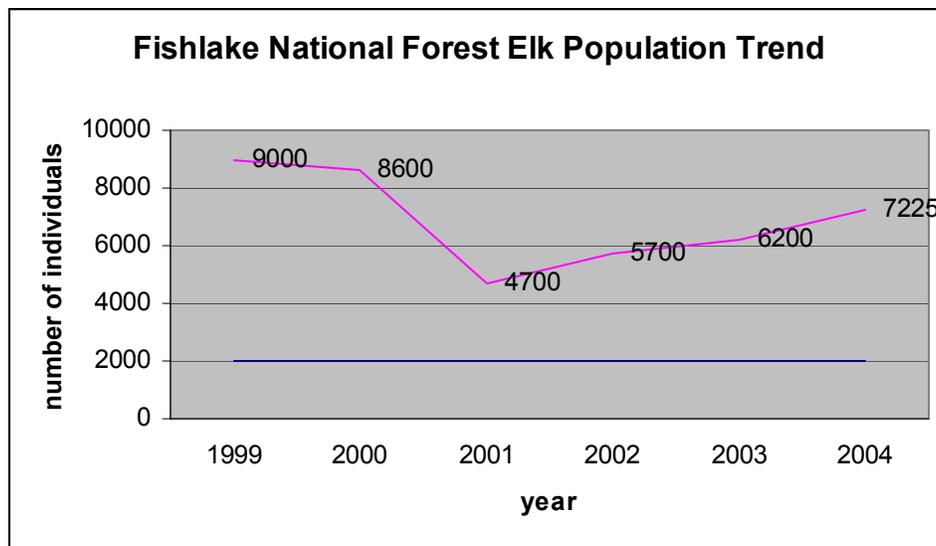


Trend

There are approximately 1,458,049 acres of potentially suitable habitat on the Fishlake National Forest. Within the Fishlake LRMP II-29, table II-8B, the estimated population size of elk on the Fishlake National Forest was 2,000 head in 1986 when the LRMP was signed. The Division of Wildlife Resources counts elk via aerial census in Utah in 3-year rotations. Based on data collected in cooperation with the Division of Wildlife Resources, there were approximately 7225 elk in the winter of 2004/2005. This number represents the Fishlake being at 80% of objective recognized in State herd unit management plans. Elk are actively managed in Utah, as there were over 300 antlerless hunting permits offered for 2005, and the Fishlake is still at 80% of objective. These data were collected during the winter, by helicopter. As a result of habitat improvement projects across the forest, these data display a 5225 head increase since 1986 when the plan was signed.

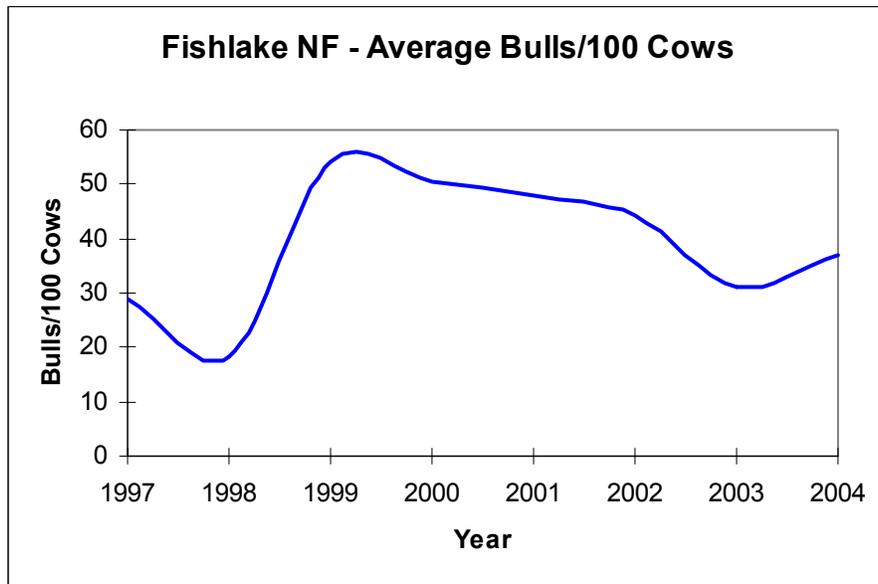
The Division of Wildlife Resources collects population data and monitors harvest levels and trends of elk populations.

Displayed below are population graphs that describe population trends on the Fishlake National Forest.

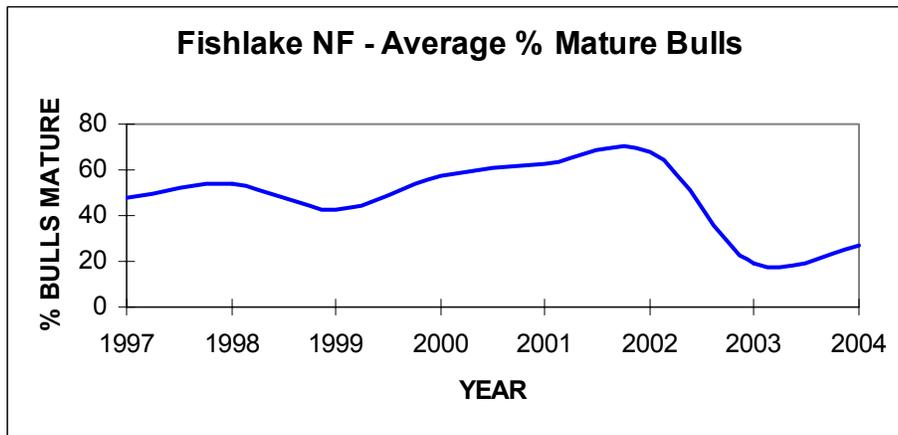


These data indicate a population decline from 2000 to 2001, but an increase from 2001 to 2004. This decline is part of an overall DWR management strategy to reduce the total number of elk in elk management units that do not comply with approved elk management plans. These reductions will only occur in units where management objectives need to be manipulated to meet unit objectives. This includes cow elk management to keep total numbers in compliance to meet herd unit objectives in the future. In the Southern Region of DWR's jurisdiction, DWR was significantly over herd unit objectives on the Fishlake portion of the Plateau unit. As a result of the 2001 hunting season, a substantial reduction in the number of antlerless elk occurred on this unit. Consequently, the total cow elk numbers are down below herd unit objectives, and the area will be counted again this coming year to obtain a more accurate count.

The number of bull elk per 100 cows in 2004 is up slightly from 1997, which demonstrates a fairly stable to upward trend based on this ratio of bulls to cows.



Presently, elk are in an upward trend, in the percentage of total number of bulls that are mature.



Hunting strategies and overall population control in Utah are made through the Regional Advisory Council and Wildlife Board process. This process has been designed to involve the people in public meetings and cover a wide range of interests in Utah. Decisions for all hunting season bag limits and season dates are rendered based on political as well as biological input. This process demonstrates that the Forest Service does not control hunted game species in the State of Utah. Based on the DWR data presented above, the population trend for elk across the Forest (located in the DWR designated Southern Region) is stable to slightly up, and populations are viable. This determination does not mean that some units may have site-specific areas that are considerably higher than approved herd unit numbers or some that may be slightly lower. It does mean that the trends of elk on the Fishlake in the Southern Region are stable to slightly up in numbers.

Mule Deer (*Odocoileus hemionus*)

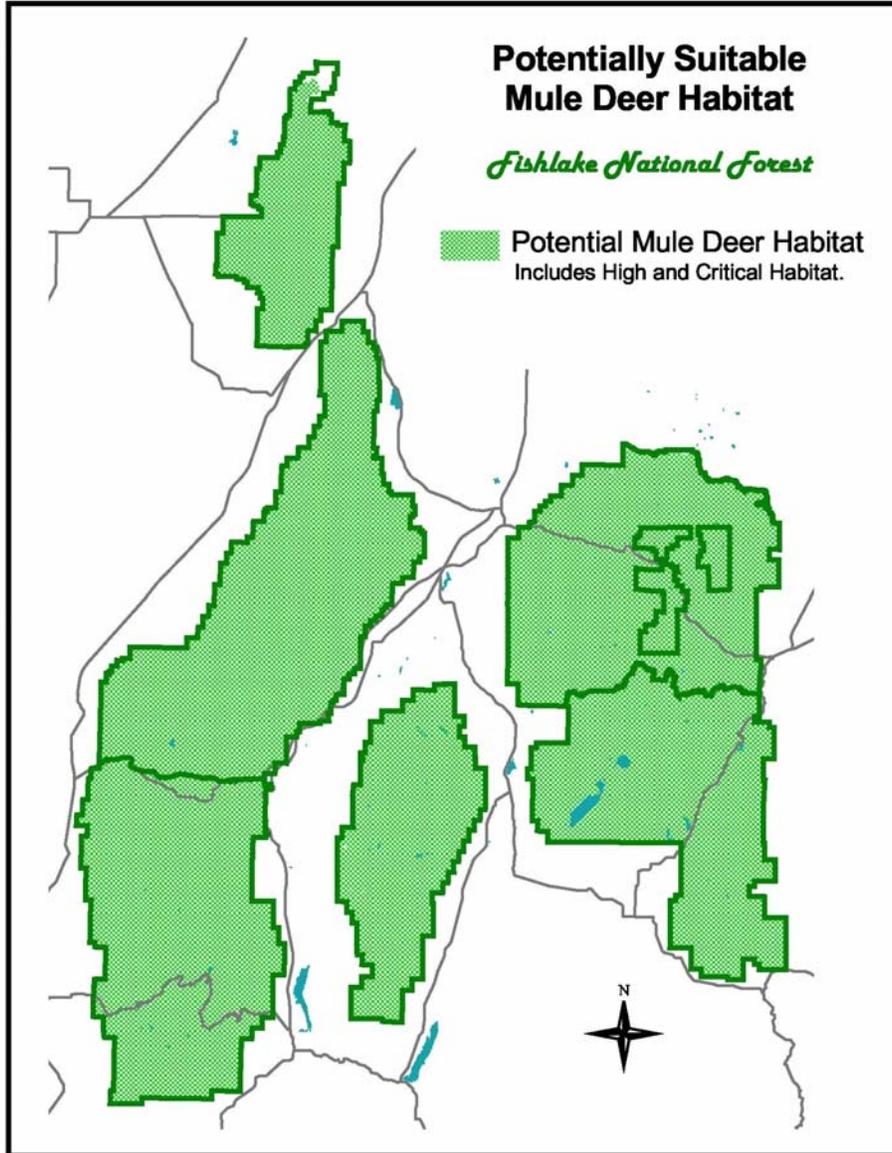
The mule deer occupies several types of habitat throughout the west. Mule deer occur in coniferous forests, desert shrubs, chaparral, and grassland with shrubs (Burt and Grossenheider 1976). They are found in early to intermediate successional stages of most forest, woodland, and brush habitats. Mule deer prefer a mosaic of various-aged vegetation that provides woody cover, meadow and shrubby openings, and free water. Brushy areas and tree thickets are important for escape cover. Vegetative cover is critical for thermal regulation in winter and summer. Mule deer use various aspects of habitat to aid in thermal regulation throughout the year; they use south-facing slopes more in cold weather, and north-facing slopes more in hot weather (Ahlborn 1990).

Mule deer browse, graze, and commonly frequent salt or mineral licks. They prefer tender new growth of various shrubs, many forbs, and a few grasses (Wallmo 1978, 1981). They forage from the ground surface into bushes and trees as high as they can reach. Mule deer also dig out subterranean mushrooms to eat. Food preferences vary with season, forage quality, and availability. Forbs and grasses are important in spring, and they feed heavily on acorns where available, primarily in the fall. Various shrubs are critical in summer and winter (Ahlborn 1990).

Fawning occurs in moderately dense shrublands and forests, dense herbaceous stands, and high-elevation riparian and mountain shrub habitats with available water and abundant forage. Mule deer are serially polygynous. The rutting season occurs in autumn. The gestation period is between 195 and 212 days. Fawns are born from early April to midsummer, varying geographically. Fawning peaks from late April through mid-June. Both males and females become sexually mature at 1.5 years old (Ahlborn 1990).

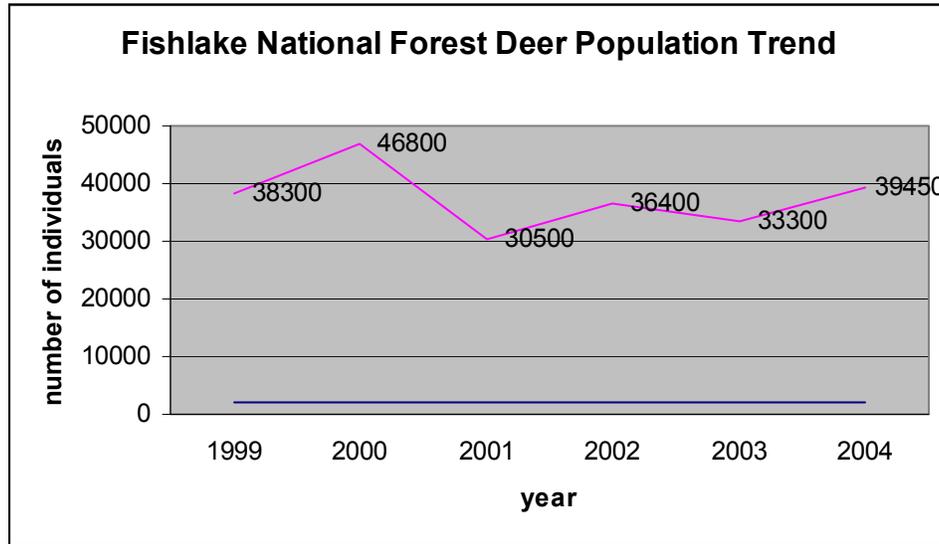
The number of natural predators of deer has been reduced in most areas. Overpopulation, with resultant winter die-offs and destruction of habitat, occurs periodically. Mule deer are preyed upon regularly by mountain lions and coyotes, and occasionally by bobcats, black bears, and domestic dogs. Deer populations can respond rapidly to habitat management. However, populations can decline in response to fragmentation, degradation or destruction of habitat caused by urban expansion, incompatible use of land resources (e.g. timber, water, rangeland), and disturbances by humans. Mule deer compete potentially for food with domestic cattle and sheep, wild horses, wild pigs, and black bears (Ahlborn 1990).

Potentially suitable mule deer habitat has been mapped across the entire Fishlake National Forest and is displayed below. This habitat consists of approximately 1,556,358 acres of potentially suitable summer and winter habitats across the forest.

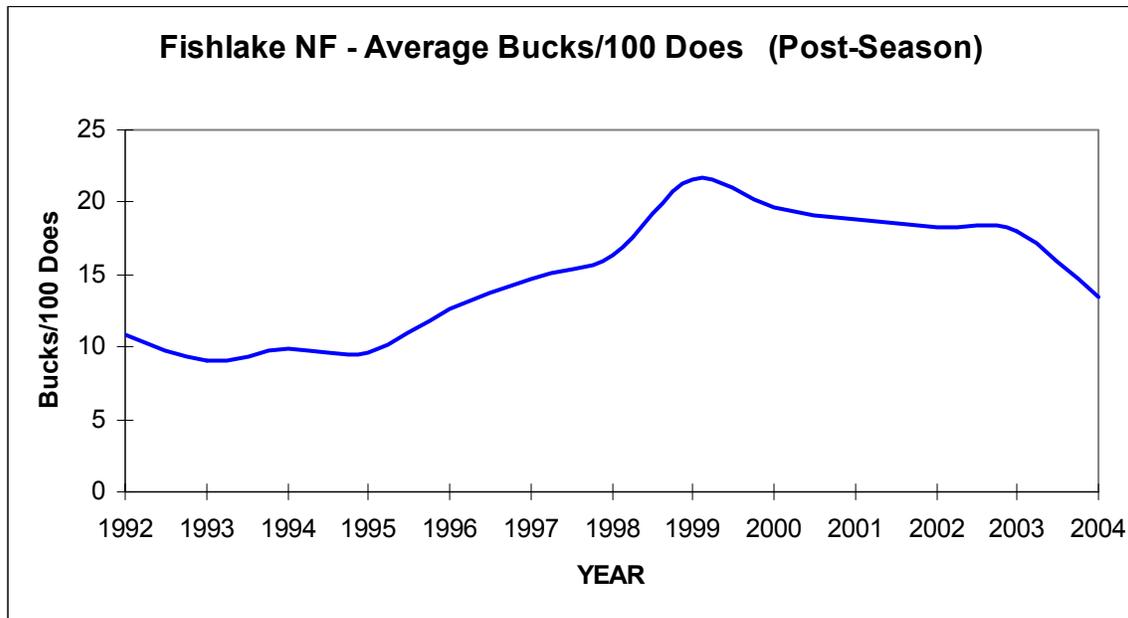


Trend

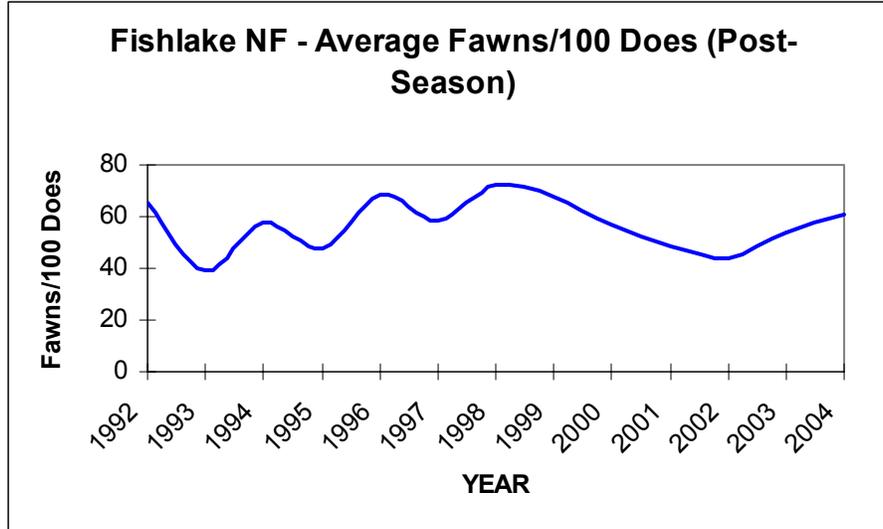
The DWR collects post-season population data and monitors harvest levels and population trends of all big game species, such as mule deer. Displayed below are population graphs that describe population trends in the Southern Region after hunting season. These data display a increase in the total number of deer over the past 3 years on the Fishlake National Forest. These data represent the Fishlake deer populations being at 70% of the herd unit objective.



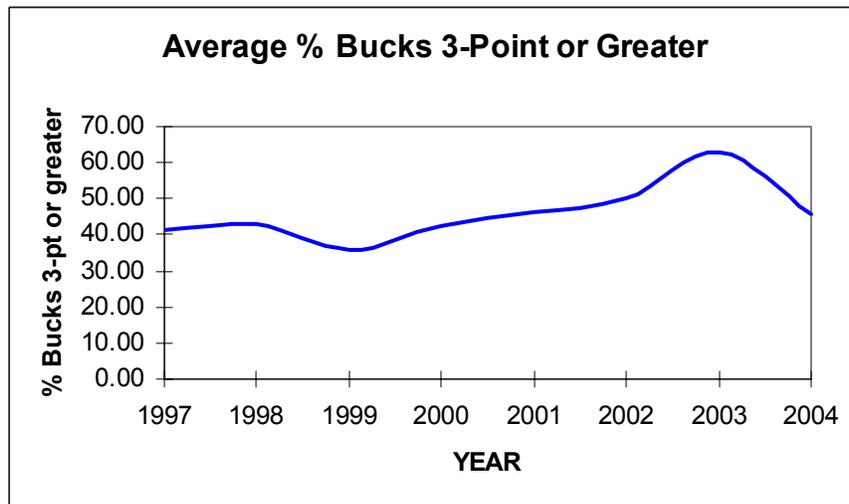
The graph below displays an overall upward trend since 1992 in the number of bucks to does.



The data presented below demonstrate a fairly stable trend in the number of deer produced on the Fishlake National Forest since 1992. These data are consistent with the past several years of drought that the Southern Region has experienced. As stated earlier, some herd units are at objective while others are below.



The data presented below demonstrates a slight increase in the number of mature buck deer since 1997. A decline was observed in 1999, and rebounded in 2003.



Hunting strategies in Utah are made through the Regional Advisory Council and Wildlife Board process. This process has been designed to involve the people in public meetings and cover a wide range of interests in Utah. Decisions for all hunting season bag limits and season dates are rendered based on political as well as biological input. This process

demonstrates that the Forest Service does not control hunted game species in the State of Utah. The data presented above demonstrate that deer populations fluctuate throughout the Southern Region. These fluctuations have been the result of numerous influences including drought, cold winters, and increased predation from large mammals, habitat modifications and degradation. Based on these data, mule deer populations and trends are stable on the Fishlake National Forest, and appear to be recovering from an extended drought.

Northern Goshawk (*Accipiter gentilis*)

Northern goshawks are associated with coniferous, deciduous, and mixed forest throughout much of the Northern hemisphere (Reynolds et al. 1992). Studies of nesting habitat show that goshawks nest in older-aged forests with variable tree species (Shuster 1980, Reynolds 1975, 1978, Saunders 1982, Moore and Henny 1983, Hall 1984). The principal forest types occupied by the goshawk in the Southwest are ponderosa pine, mixed-species, and spruce-fir (Reynolds et al. 1992). The most consistent vegetative characteristic of goshawk nest sites is a high percent canopy closure (Reynolds et al. 1992). Goshawks typically nest in stands with canopy cover between 60% and 80% (Crocker-Bedford and Chaney 1988). Studies of habitat characteristics at goshawk nest sites have reported average canopy closure measurements from 75% in northern California to 88% in northwestern California (Saunders 1982, Hall 1984). Stand structure ranges from dense multi-layered stands in Oregon (Reynolds 1978) to open park-like understories in Colorado and California (Shuster 1980, Saunders 1982, Hall 1984). Average nest tree size is just as variable, with mean tree diameters ranging from 8-20 inches in Colorado (Shuster 1980), 20 inches in Oregon (Moore and Henny 1983), and 36 inches in northwestern California (Hall 1984).

Goshawks appear to prefer north to east aspects for nest sites (Moore and Henny 1983, Reynolds 1978, Shuster 1980, Hall 1984), as tree stands within these aspects are typically denser and more suitable (Reynolds 1987). Slope also appears important, as nests are usually placed on flat to moderately sloped (1-40 % grade) land where trees are larger and grow at a higher density (Reynolds 1978, Shuster 1980, Reynolds et al. 1992). Hennessy (1978) observed that there was a tendency for goshawks to build nests near or on trails, edges, dirt roads, or other clearings such that clear flight lanes were provided to and from the nest.

The importance of the proximity of the nest area to water is not known. Moore and Henny (1983) found that the distance of water from nests averaged approximately 650 feet. Hall (1984) found an average distance of 500 feet. Shuster (1980) found that nests were rarely further than 900 feet from water. Hennessy (1978) found an average of 1300 feet in Utah. Crocker-Bedford and Chaney (1988) suggested that a permanent water source is not required, but there may be a preference for this condition.

Reynolds and Meslow (1984) found that the goshawk is a height zone generalist, taking prey from the ground-shrub and shrub-canopy layers. Bloom et al. (1986) stress the importance of meadows, streams, and aspen stands, which may be important for prey species on which the goshawk feeds. However, Bartelt (1977) observed that goshawks forage in a variety of habitats, probably along edge as well as in deep forests, and Schnell (1958) even observed a goshawk wading through water to prey on ducklings. Moore (1980) also noted use of edge. The presence of prey plucking sites within the nesting territory is also a habitat characteristic related to foraging. Prey plucking sites usually consist of stumps, fallen logs, snags, or arched trees (Bartelt 1977, McCarthy et al. 1989, Schnell 1958). In Oregon and California studies, goshawks were found to forage primarily on birds and mammals (Reynolds 1975, 1978, Bloom et al. 1986). In northern Arizona, Boal and Mannan (1991) found that the golden-mantled ground squirrel, cottontail rabbit, Steller's jay, and northern flicker were the primary prey species.

Available evidence suggests that two important resources, food and nest habitat, are the principle mechanisms limiting goshawk densities (Newton 1989, 1991). Specifically, populations may be limited by shortage of nest sites; and where nest sites are readily available, densities may be limited by food abundance and availability (Newton 1991).

Goshawks begin breeding activities in April (McGowan 1973, Moore 1980, Hennessy 1978). Nests are typically large stick platform structures built in a fork near the trunk of the tree, on a large branch, or on top of a mistletoe whorl, 15-50 feet from the ground, just below the crown (Eng and Gullion 1962, McGowan 1973, Bartelt 1977, Moore 1980, Saunders 1982, Hall 1984, Hennessy 1978, Shuster 1980, Reynolds 1987, Bloom et al. 1986). Clutches of 2-4 eggs are laid in mid-May, and incubation lasts about 30 days, with the nestling period extending through mid-July (Reynolds 1975, Moore 1980). Young are fledged between July 15 and August 15 and may be dependent on adults for food until September 30 (Hennessy 1978, Reynolds 1975). Goshawks typically build more than one nest, placing alternates in adjacent trees or up to a half mile away (Reynolds et al. 1992, McGowan 1973). Goshawks may alternate between these nests on an annual or semi-annual basis, may use the same nest for years in a row, or build a new nest in the same area (Reynolds 1975, Reynolds and Wight 1978, Reynolds et al. 1992, McGowan 1973).

The northern goshawk is holarctic in distribution. In North America it occurs primarily in boreal forests, but it also occurs far to the south in montane forests of the western United States and Mexico. The most widespread subspecies (*A. g. atricapillus*) occurs from the northeastern United States across the boreal forests of Canada to Alaska and southward through the upland forests of the western United States (Reynolds et al. 1992). The goshawk is partly migratory in the northern portion of its range, where in winters of food shortage it migrates southward (Mueller and Berger 1967). In high elevations and montane areas, some goshawks descend into lower elevations with woodlands, riparian areas, and scrublands during the winter (Kennedy unpublished data cited in Reynolds et al. 1992).

The Utah Northern Goshawk Conservation Strategy and Agreement is being implemented on the Fishlake National Forest. The Forest recognizes this document for its sound ecological base, and is implementing the principals contained within. Furthermore, the Forest recognizes this publication as the best science available on goshawk management in Utah. Based on the data evaluated for this Strategy and the publication *The Northern Goshawk in Utah: Habitat Assessment and Management Recommendations* by Graham et al. (1999), goshawk populations are stable in Utah. In addition to these programmatic sources of science, the Forest is implementing the 1999 Utah Northern Goshawk Project Environmental Assessment, which provides standards and guidelines for individual forest plan amendments.

Trend

Goshawk populations on the Fishlake National Forest fluctuate within reproductive seasons, and from season to season. They are affected by a number of factors such as drought; cold and wet early spring conditions, low prey densities, significant wind events, fire, modified vegetation in the landscape and predators. As a result of a combination of these events across the forest over the past several years, the 26-goshawk territories across the forest have experienced a decline in nesting activity, and occupancy.

According to data collected on the Fishlake National Forest, approximately 26 nest territories occur on the Forest as of the 2004 nesting season. Forty-four nests have been documented within these territories. The number of nests found in a year can vary as a result of high winds and other natural events that can affect nests. Nesting activity ranges across the Forest from 8-12 nests annually. Ten nests were confirmed active in 2004. Although the numbers of active nests have been down, occupied territories (birds in the nest area, but not confirmed as nesting) have been commonly observed.

The data used in this determination was obtained by annual field reviews from District wildlife biologists. While the population of nesting goshawks on the Fishlake is experiencing a dip in trend, this population is still under review. This review is based on additional surveys in adjacent available and suitable habitats across the Forest, the number of occupied territories (birds in the territory but not nesting), and overall population numbers. Poor reproductive success due to severe sustained drought conditions in southern Utah has been a primary concern. This situation is not repeated on other National Forests in Utah, such as the Dixie where higher amounts of precipitation have been obtained and territory occupancy is up.