VII. UNIT EVALUATIONS

The following are brief discussions of each of the 11 DAUs deer populations, habitat conditions, and some opportunities discussed at the April 1997 workshop. More specific, detailed evaluations will be developed as needed for each Pilot Management Strategy to be implemented.

DAU 1- North Coast

Description

The North Coast unit comprises about 16,500 square miles south from the Oregon border and west of Interstate 5. Deer populations, of the Columbian black-tailed (*Odocoileus hemionus columbianus*) variety, occur at comparatively higher densities in this unit than elsewhere in the state. Primary ownership in the DAU is private (48%) and USFS (44%). Deer are migratory in some areas where topographic variation is high such as the Trinity Alps and Marble Mountains area. Elsewhere they seasonally move about within a year-round home range and are considered resident deer.

The DAU is typified by coastal redwood forest, Douglas fir, ponderosa pine, and other conifer species forests, montane and coastal shrubfields and chaparral, riparian-wetland, aspen, and oak woodland-grassland.

Deer population trend

The deer population in DAU 1 is considered fairly stable in recent years from about 170,000-250,000 (Figure 5). This DAU is the most productive (based on a per unit area evaluation) in terms of deer/square mile. Longhurst et al. (1952) estimated 190,000 deer in this geographic area within the present range estimated.

Habitat issues and opportunities

Longhurst et al. (1952) rated (possible ratings were very poor, to poor, fair, good, or excellent) all the deer range that comprises this DAU as very poor, poor, or fair. However, workshop participants were not as negative in their assessment although potential for improving was discussed.

Greater emphasis to improve declining summer and fall habitat conditions so that deer populations can be sent to winter ranges in as good a condition as possible was recommended. Early successional habitats are considered to be declining in quality and abundance over time, but little actual monitoring data is collected other than long-term photo-documentation. Recent Landsat image data from the Trinity River Basin indicate low amounts of feeding range and high amounts of cover for deer and other wildlife (B. Boroski, pers. comm.). Deer winter ranges in some areas were identified as lacking forage. Declining habitat conditions in some areas may be a consequence of increased competition between native herbivores and livestock. There are some riparian concerns related to overgrazing/browsing by native and domestic herbivores in the Mendocino portion of the DAU.

Historically, clear-cutting and wild/prescribed fire have been the disturbance factors contributing the most to increasing early successional habitats by opening tree-dominated stands or dense chaparral. Recommendations to improve habitat conditions in this unit focused on the need for large-scale disturbances such as fire. Fire was discussed as being easier to implement in this unit compared to others because of fewer air quality constraints. However, the Northwest Forest Plan and accomodations for late successional reserves were considered to be constraints to implementing a program designed to favor early successional habitat. The USFS Forest Health Protection Plan was identified as a potential means to advocate and interject more prescribed fire into the system.

DAU 2 Northeastern California

Description

The Northeastern California unit comprises about 10,200 square miles in the extreme corner of the state. Deer populations are comprised of both black-tailed and Rocky Mountain mule deer (*Odocoileus hemionus hemionus*). Primary ownership in the DAU is USFS (42%), private (34%), and BLM (21%).

The DAU is comprised of Great Basin vegetation dominated by big sagebrush, antelope bitterbrush, perennial grasses, juniper, and annual grasses. Montane forest communities consisting of mixed conifer, pine/grass, and pine/bitterbrush types are common at higher elevations. Riparian-wetland, mountain meadow, aspen, mountain mahogany, and oak woodland are some other key habitats or vegetation types of importance to deer. Private lands in agriculture (e.g., alfalfa) have replaced some of the wintering habitat of deer, but deer use these fields heavily in some areas.

Deer population trend

In recent years, the deer population in DAU 2 has declined more than any other in the state (est. from about 90,000 in 1992 to 25,000 in 1996). Longhurst et al. (1952) estimated 100,000 deer in this unit's area. This area of the state historically has been considered the destination for hunting big mule deer, and most of the "X" hunt zones comprising the area are highly sought after by hunters. The decline in deer populations in this DAU, and in DAU 3, as reflected in decreased hunter opportunity, is considered an important cause of dissatisfaction among California deer hunters.

Habitat issues and opportunities

Habitat concerns in DAU 2 focus on fire, grazing, and encroachment of less desirable plant species as having the greatest negative impacts. Thinning and/or underburning of timber stands to reduce the risk of wildfire is also of concern where elimination of understory forage and cover is reduced. The relatively low and variable precipitation in this DAU makes opportunities and success for habitat improvements less predictable than desired.

Great Basin shrub communities dominated by sagebrush/bitterbrush are typically reduced by fire that occurs in the dry season. Resprouting and seed germination of bitterbrush can occur in some of the moister environments, such as the pine-bitterbrush communities, or higher elevation shrub ranges, but in the treeless winter range areas of the DAU, burned sagebrush/bitterbrush sites are often recolonized by exotic annual grasses (primarily cheatgrass) to the detriment of native plant species (Evans and Young 1978). To date, rehabilitation efforts in these areas have met with limited success, although an agressive program may be a desirable opportunity. The inability to ensure rejuvenation of shrub stands in Great Basin communities has led to opposition to the use of prescribed fire. Fire-proofing valuable stands is one consideration--greenstripping is a method that can be used adjacent to highways. Using livestock in the early season to eat herbaceous forage in shrub stands is commonly advocated although monitoring to assure minimal use of bitterbrush would be needed.

Bitterbrush is unproductive over much of it's range in the DAU because of natural maturation of the stands and repeated heavy browsing by livestock and wildlife. For example, little regeneration of bitterbrush has been documented on East Lassen-Washoe deer ranges since 1951 (DFG unpubl. data 1996). Decreasing allowable use levels on bitterbrush by livestock so that potential seed production is increased, and use reserved for deer, is an opportunity to attempt recovery of stands. Some bitterbrush improvement was identified as a consequence of depressed deer populations and good water supplies in recent years. Taking advantage of such circumstances by planting/protecting bitterbrush seedlings in the future is desirable.

Mountain mahogany stands, of limited area but a highly valued habitat that provides food and cover, are also impacted by fire. Seeds frequently germinate following fire, but because of herbivores, appear to rarely get established. Barton (1995) recently observed the apparent successful regeneration of mountain mahogany seeds around and under pruned limbs.

Aspen provides a multi-tiered habitat structure that is valuable for deer, other wildlife, and livestock. Aspen stands are declining in many areas, primarily due to a long history of livestock use. Because of the limited distribution of aspen stands and typically small patch size, efforts to maintain and enhance them could be a focused opportunity that would benefit all. Similarly, small meadows, springs, seeps, and riparian areas are important habitats to deer. Improved grazing management to avoid exceeding prescribed utilization levels are needed to ensure resotration and maintenance of these patch habitats. More timely monitoring and herding of livestock would help alleviate potential problems on key habitats. Fencing is also an option, although costly.

Encroachment of juniper into shrub/grass communities has been ongoing for decades. For deer, juniper provides valuable cover and a small amount of winter browse, however it is not as desirable as the shrub/grass communities it replaces. A desirable treatment for deer habitat enhancement would be to eliminate juniper in patches so that a more diverse mix of cover stands and openings is created. Mechanisms to reduce juniper include mechanical treatments and prescribed fire. One concern with juniper control efforts is the possibility of killing desirable grass/shrub species with a hot fire in summer. More work on site-adapted seed sources is needed to effectively accomplish revegetation efforts. Several organizations would be interested in addressing this unmet need.

In forest stands, use of prescribed burns to fireproof timber stands in the DAU are being used as a preventive tool against summer wildfire. However, the resultant effects on deer and other wildlife are not well documented.

Development issues on deer winter range, particularly in the vicinity of Susanville and Alturas, place greater impact and importance on winter ranges administered by the USFS and BLM.

DAU 3- Northeast Sierra Nevada

Description

The Northeast Sierra Nevada unit comprises about 3,600 square miles from Susanville to south of Lake Tahoe along the California-Nevada border. The DAU runs east of Highway 89 north of Lake Tahoe and east of the Sierra Crest in the south. Deer populations are comprised of some black-tailed in the northwest, but are primarily Rocky Mountain mule deer (*Odocoileus hemionus hemionus*) that summer in the Sierra Nevada and winter on the east side including parts of Nevada. Primary ownership in the DAU is USFS (63%) and private land (33%) (California only). BLM manages about 3 percent in California side, but quite a bit of additional winter range in Nevada.

The DAU is comprised of Great Basin vegetation dominated by big sagebrush, antelope bitterbrush, perennial grasses, pinyon-juniper, and annual grasses. The summer range is dominated by montane forest communities consisting of Jeffrey pine/grass, fir, and pine/Ceanothus types are common on FS lands. Riparian-wetland, aspen, shrub communities of Ceanothus species, and oak woodland are some other key habitats or vegetation types of importance to deer. Private lands in agriculture (e.g., alfalfa) have replaced some of the wintering habitat of deer, but deer use heavily use these fields in some areas.

Deer population trend

In recent years, the deer population in DAU 3 has declined nearly as dramatically as DAU 2 (est. from about 40,000 in 1992 to 10,000 in 1996). Like DAU 2, this area of the state has also been a desirable place to go hunting for big mule deer. The decline in deer populations in this DAU, and in DAU 2, as reflected in decreased hunter opportunity, are considered the leading cause of dissatisfaction among California deer hunters.

Habitat issues and opportunities

The habitat issues identified in this DAU are declining winter range conditions as affected by summer fires and grazing; development on winter ranges from the Carson City area to Susanville, especially around Reno and on summer ranges around Lake Tahoe/Truckee; grazing impacts on summer range habitats (mt. meadow, riparian, aspen); lack of fire in forested ranges; and forest understory thinning. Thinning and burning on summer range could be modified to enhance rather than degrade deer habitat. Forest plans could incorporate modifications to benefit habitat; however, this opportunity is not there in areas where fire suppression must occur.

Competition with livestock on summer ranges was identified as a problem, with aspen and riparian habitats declining in area. A compounding factor is the decline in habitats that provide the herbaceous and shrub forage used by both deer and livestock. Understory vegetation is considered to be in poor condition on most of the summer range. Modifying timber harvest practices to encourage more aspen regeneration is an opportunity. Keeping livestock out of aspen stands and reducing white fir encroachment are others.

The winter range has suffered dramatic change recently due to extended drought and fire (over 200,000 acres burned in the 1980s [Figure 11]; Loft and Menke 1990). Fires and grazing have impacted bitterbrush, and restoration efforts have had little success.

DAU 4- Cascade-North Sierra Nevada unit

Description

The Cascade-North Sierra Nevada unit comprises about 7,000 square miles from the Oregon border south to the Lake Almanor area and Feather River drainage. Deer populations are comprised of black-tailed and Rocky Mountain mule deer. Primary ownership in the DAU is private (61%) and USFS (33%).

The DAU is comprised of conifer forest dominated summer ranges, with pine/bitterbrush associations in the north and Sierra mixed conifer to the south. Common species included within the forest community are oak, aspen, riparian-wetland areas, willow, Ceanothus, and manzanita. Winter ranges are composed largely of oak-woodland, oak-annual grass savanna, chaparral shrub stands, agricultural fields, and sagebrush/bitterbrush/grass communities. Because of the large private forest ownership, a significant portion of the DAU is commercial forest dominated.

Deer population trend

The deer population has moved from 60,000-70,000 animals down to 35,000-45,000 in the past several years. Longhurst et al. (1952) estimated there were 69,000 in these areas. Deer productivity in the winter ranges of Shasta-Tehama counties has been linked to fall rains and the germination of annual vegetation. Recent deer declines may be partially attributable to a hard freeze several years ago that killed desirable browse species in some parts of the summer range.

Habitat issues and opportunities

The main habitat issues affecting deer in the DAU are associated with forestry practices, lack of habitat disturbance that favors early successional communities, and localized overuse by livestock on summer range habitats. Obvious overbrowsing by deer is apparent in the Almanor Basin, and includes severe hedging of desirable browse (e.g., mountain whitethorn) as well as seemingly less desirable browse (e.g., greenleaf manzanita and fir seedlings). This suggests a lack of disturbance and consequent lack of high quality early successional habitat.

Biomass harvest and forest thinning practices are regarded as activities detrimental to early successional habitat in the DAU. Shrub response and abundance is reduced by these activities, thereby exacerbating forage limitations. Adequate prescriptions are needed for biomass and thinning practices to accomodate early successsional conditions.

Decadent shrubfields dominate much of the range, and in some areas shrub stands may serve as the climax community. There is a need to develop prescriptions for mixes of shrub age stands. The USFS's "Forest Health" is developing as a policy. There is a need to help define forest health from a wildlife or vegetation succession standpoint. It was suggested there may be some potential to swap land units so that the timber base is maintained and there is reduced resistance to accomodating deer.

It was recommended that more effective monitoring of use and removal of livestock is needed when target utilization levels are reached on riparian-wetland, willow, bitterbrush, and aspen ranges.

DAU 5- Central Sierra Nevada

Description

The Central Sierra Nevada unit comprises about 10,500 square miles from the Feather River drainage (and Highway 70) south to Yosemite National Park, and generally west of Highway 89 and the Sierra Crest. Deer populations are comprised of black-tailed and California mule deer, although Rocky Mountain mule deer share some of the summer range. Primary ownership in the DAU is private (45%), USFS (39%), National Park Service (11%), and BLM (3%). Checkerboard ownership of private/USFS land occurs in the northern half of the DAU; much of the winter range is on private lands in the north, and on public lands in the south.

The DAU is typified by mixed conifer forest summer ranges. Common species/habitats important to deer that are included within the forest community are oak, aspen, riparian-wetland areas, willow, Ceanothus, and manzanita. Winter ranges are composed largely of oak-woodland, oak-annual grass savanna, chaparral shrub stands, and agricultural fields.

Deer population trend

The deer population has moved from 120,000-130,000 animals down to 50,000-90,000 in the past several years. Longhurst et al. (1952) reported of “repeated die-offs” and attributed them to malnutrition caused by “too many deer on too little winter range.” They forecast a continued downward trend for the estimated 150,000 deer on the west slope because of habitat issues.

Habitat issues and opportunities

The main habitat issues affecting deer in the DAU are associated with forestry practices, lack of habitat disturbance that favors early successional communities, and overuse by livestock on key summer range habitats. Human development and encroachment onto private wildlands has been significant in many areas. Presence of this urban interface, adjacent to public lands, restricts options for use of fire to manipulate habitat, thereby resulting in declining early successional habitat.

Wildfire burned areas on forest land have been intensively reworked with herbicides and tree planting to the detriment of deer. Use of herbicides following fire on private forest land is increasing, thereby exacerbating public land impacts and importance for meeting wildlife objectives. Planned spring burning is being sold as ecosystem process, but does not mimic natural events and could be detrimental to deer habitat. Also, some burn projects have been labeled wildlife enhancement work when they were not. However, there is a need to integrate fuel reduction projects with habitat work when possible. “Open and park-like” goals for forests (favored for tree production) may not be desirable from an ecosystem perspective except at localized scale.

Livestock grazing is considered an important issue on the summer range. Competition for forage and negative impacts to habitats such as meadow-riparian, aspen, and willow are of concern on most forests. Where other than continuous season-long grazing systems are in place (Kennedy Meadows cited as an example), rotation grazing appears to have benefitted deer populations. Other opportunities include improved grazing management to reduce impacts to key habitats and application of fire to enhance early successional deer habitat in forest communities.

DAU 6- Eastern Sierra Nevada

Description

The eastern Sierra Nevada unit comprises about 7,500 square miles on the east side of the Sierra Nevada from Mono County south through Inyo County. Deer populations are comprised of Rocky Mountain and Inyo mule deer. These deer may share summer ranges with California mule deer. Primary ownership in the DAU is USFS (48%), BLM (28%), National Park Service (13%), and private (4%). Much of the summer range is FS land and much of the winter range is BLM land.

The DAU is typified by mixed conifer forest summer ranges. Common species/habitats important to deer that are included within the forest community are aspen, riparian-wetland areas, willow, ceanothus, and manzanita. Winter ranges are typified by bitterbrush, sagebrush, pinon pine, mahogany, blackbush, and some agricultural/pasture on private land.

Deer population trend

The deer population has moved from about 26,000-28,000 animals down to 10,000-13,000 in the past several years. Longhurst et al. (1952) estimated about 65,000 deer on the east slope from the Walker River south in this DAU. They attributed deer range problems to livestock on winter ranges and to overuse by deer. Currently, studies indicate fawn mortality is high on summer ranges, while adult mortality primarily occurs on winter ranges. Causitive factors on summer range are not well-documented.

Habitat issues and opportunities

Public land habitat issues were livestock grazing impacts on key summer range habitats, increasing pinon pine on some winter range areas to the detriment of more desirable browse, and loss of key bitterbrush winter range to fire. On private lands, development in Nevada and California is becoming a greater problem for deer as it continually reduces the amount of winter range.

There is high concern about loss of winter range bitterbrush to fire (Round Valley near Bishop is an example). Winter range shrub range manipulation opportunities are considered few because of the unreliable chance for success, but experimental approaches are being initiated by BLM and the DFG. Additionally, successional changes are slow in this DAU because of harsh environment on both winter and summer range, hence recovery from mistakes (e.g., overgrazing or inappropriate use of fire) are long-lasting. It was mentioned that deer population trends may be affected by other factors more than habitat quantity and quality. Grazing is a serious issue on summer ranges, particularly in mountain meadow and riparian habitats. Poor fawn survival could be a consequence of livestock impacts as shown in recent Sierra Nevada studies, although more specific knowledge is still needed.

It was recommended that we evaluate purchase of important wildlife habitats to enhance recovery opportunity for deer on winter range. Pinon pine invasion is increasing and possibly becoming an issue on winter ranges. Other opportunities include improved grazing management to reduce impacts to key habitats and application of fire to enhance early successional deer habitat in forest communities.

DAU 7- South Sierra

Description

The south Sierra Nevada unit comprises about 8,800 square miles on the west side of the Sierra Nevada from Yosemite National Park south to the Kern River drainage area, then across the Tehachapi's to Interstate 5. Deer populations are comprised of California mule deer, although these deer may share summer ranges with Rocky Mountain and Inyo mule deer. Primary ownership in the DAU is USFS (40%), private (39%), National Park Service (15%), and BLM (4%). Much of the summer range is FS and NPS land and much of the winter range is private or FS land.

The DAU is typified by mixed conifer forest summer ranges. Common species/habitats important to deer that are included within the forest community are aspen, riparian-wetland areas, willow, ceanothus, and manzanita. Winter ranges are composed largely of oak-woodland, oak-annual grass savanna, chaparral shrub stands, and agricultural fields/pasture. The southeastern portion of the DAU gets into Mojave Desert influenced plant communities.

Deer population trend

The deer population has been fairly stable at 30,000-40,000 animals in the past several years. Longhurst et al. (1952) estimated about 95,000 deer in this DAU, illustrating how far we have declined since the late 1940s. They attributed deer range problems to livestock on winter ranges and to overuse by deer. Currently, studies indicate fawn mortality is high on summer ranges, while adult mortality primarily occurs on winter ranges. Causitive factors on summer range are not well-documented. Resident deer were considered to be responding positively to wildfires, while migratory deer populations were not.

Habitat issues and opportunities

The primary habitat issues are livestock grazing impacts on key summer range habitats (e.g., aspen, mountain meadow, riparian), and on winter range (e.g., Rodgers Ridge); lack of fire on some of the summer range forested areas, and too much fire in some winter range shrub communities. There is some concern about the implications of prescribed burning on summer range brushfields (huckleberry oak stands).

Opportunities include improved grazing management to reduce impacts to key habitats and application of fire to enhance early successional deer habitat in forest communities.

DAU 8 Central Coast (North)

Description

The Central Coast unit comprises about 6,300 square miles from Mendocino County east to Interstate 5 and south to the Delta and San Francisco Bay. Deer populations are comprised of black-tailed deer. Primary ownership in the DAU is private (83%), USFS (5%), and BLM (7%). Deer in the unit are largely resident animals that exhibit some upslope/downslope movement with seasonal changes in weather and forage conditions. However, some winter range areas have been delineated in the Mendocino National Forest.

The DAU is typified by mixed conifer forest summer ranges. Common species/habitats important to deer that are included within the forest community are several oak species, western mountain mahogany, chamise, riparian-wetland areas, willow/birch, ceanothus, and manzanita. Oak-woodland, oak-annual grass savanna, chaparral shrub stands, are common at lower elevations. Agricultural fields, pastures, and vineyards occur throughout the area in valley bottoms.

Deer population trend

The deer population has varied from about 90,000-140,000 in the past several years, but appears fairly stable over the seven year period 1990-96. Longhurst et al. (1952) estimated 119,000 deer in this unit, within the range of current estimates, but fewer than the peak in the late 1950-60s. Long-term studies (e.g., Taber and Dasmann 1958) have nicely described the factors affecting deer populations in this unit and how they respond to land management activities, especially fire.

Habitat issues and opportunities

Deer use in some areas is concentrated on riparian habitat and stream corridors to the detriment of the habitat. Part of the problem is believed to be a shortage of early successional habitat and forage during summer. Public land habitats are considered to be decadent shrubfields in many areas. Concern that spring burning tends to cause a switch from a diverse mix of browse to chamise dominated stands

Past opportunity has been missed with USFS burn programs, and more planning efforts to promote mosaic patterns of habitats are needed. There is a desire to move to fall burning and/or mechanical manipulation and away from spring burning. Private lands are very important and there is a need to support private landowner efforts to maintain/enhance wildlands through programs such as the Department's PLM program or other incentives.

DAU 9- Central Coast (South)

Description

The Central Coast south unit comprises about 15,600 square miles from the Delta and San Francisco Bay west of Interstate 5 and south through Ventura County. Deer populations are comprised of black-tailed in the north and California mule deer in the south. Primary ownership in the DAU is private (71%), USFS (18%), and BLM (4%). Deer in the unit are resident animals that exhibit some upslope/downslope movement with seasonal changes in weather and forage conditions.

The DAU is typified by pine forest summer ranges. Common species/habitats important to deer that are included within the forest community are several oak species, pinon-juniper, chamise, riparian-wetland areas, willow/birch, ceanothus, and manzanita. Oak-woodland, oak-annual grass savanna, chaparral shrub stands, are common at lower elevations. Agricultural fields, pastures, and vineyards occur throughout the area in valley bottoms.

Deer population trend

The deer population has varied from about 70,000-120,000 in the past several years, but appears stable to increasing over the seven year period 1990-96. Longhurst et al. (1952) estimated 202,000 deer in this unit, within the range of current estimates, but fewer than the peak in the late 1950-60s.

Habitat issues and opportunities

Because of the dominance of private land, there is need to focus on providing incentive and support for deer management on these lands. Developing vineyards are converting much habitat, and result in increases in depredation problems. On public lands, summer forage is considered laking because of decadent shrub dominated stands. Recent large fires in the San Luis Obispo area occurred and should soon provide benefits in the area. Lack of blue oak regeneration is considered a problem throughout the unit.

Past opportunity has been missed with USFS burn programs, and more planning efforts to promote mosaic patterns of habitats are needed. There is a desire to move to fall burning and/or mechanical manipulation and away from spring burning. Fall burns to date have been generally successful. In some areas, north slope burning should be increased, as long as potential loss of hardwoods is considered to not be significant.

Post-wildfire prescriptions need to better develop the long-term habitat objectives for an area so as to maintain mosaic patterns of habitat. Private lands are very important and there is a need to support private landowner efforts to maintain/enhance wildlands through programs such as the Department’s PLM program or other incentives.

DAU 10- South Coast

Description

The South Coast south unit comprises about 7,800 square miles from Los Angeles County south to the border with Mexico and east to Interstate 10. It includes the San Bernardino Mountains. Deer populations are comprised of California and Southern mule deer, with some burro deer in the Santa Rosa Mountains. Primary ownership in the DAU is private (45%), USFS (34%), other public lands (10%), and BLM (8%). Deer inhabiting the higher mountains are migratory (Nicholson 1995), while deer in the coastal areas and lower elevations are resident animals that exhibit some upslope/downslope movement with seasonal changes in weather and forage conditions.

The DAU is typified by chamise chaparral, oak woodland, grassland, coastal scrub, sagebrush, and pine communities. Other habitats important to deer include montane riparian and meadow.

Deer population trend

The deer population has varied from about 16,000-24,000 in the past several years, but appears fairly stable over the seven year period 1990-96. Longhurst et al. (1952) estimated 79,000 deer in this unit, far more than current estimates, and somewhat understandable given the changes to Southern California's landscape.

Habitat issues and opportunities

Encroachment by development on private lands adjacent to the public land interface is a primary habitat issue in the unit. On public lands, people management was considered the biggest issue. Human disturbance is regarded as a problem for deer populations, and may be impacting deer use of key habitats.

Focused programs to implement prescribed burning programs have been effective at maintaining early successional habitats in some watersheds. Restrictions on burning can make it difficult to implement habitat improvement efforts. Further, ongoing conservation planning efforts in part of the unit may dictate habitat manipulation potential. Representative habitat guidelines (e.g., Laguna Morena) are often not implemented. Livestock grazing is of concern on key meadow habitats in the southern mountains (Bowyer and Bleich 1984).

DAU 11- Desert

Description

The Desert unit comprises about 7,500 square miles of the Mojave and Colorado/Sonoran Desert areas and extends east to the California border. It includes the Colorado River area and isolated mountain ranges in the eastern counties.

Deer populations are comprised of burro deer. Primary ownership in the DAU is BLM (51%), NPS (22%), private (14%), and military (9%). Deer movements occur seasonally, and in response to need for reliable water and forage sources. Movement down to near permanent water sources such as the Colorado River area or permanent canals typically occurs in late spring.

The DAU is typified by desert scrub, with habitats important to deer occurring in the riparian drainages and desert washes. In some of the ranges, waxy bitterbrush, sagebrush, and juniper occur.

Deer population trend

The extreme environment results in low densities of deer. Annual fluctuation in forage and water conditions away from the permanent sources of water, likely play an important role in annual variations in population. The overall deer population has varied from about 2,000-5,000 in the past several years, and appears to be stable at around 2,000 because Longhurst et al. (1952) estimated 2,100 deer in this unit, similar to current estimates.

Habitat issues and opportunities

Competition for water, forage, space with burros is a long-term problem, particularly in preferred habitats. Other public land uses that have some effect, mostly localized, are mining operations and OHV use. Development and agriculture in riparian bottomlands along the Colorado River removes native habitat, decreases carrying capacity, and increases potential problems relating to depredation.

The primary opportunities in the unit are continued development and maintenance of effective water sources and implementation of some control over burro populations. Habitat conservation/protection measures would also contribute to maintaining deer and other wildlife populations.