

County DPS would allow more management flexibility, such as hazing to disperse the deer to reduce or prevent large deer concentrations, or a regulated harvest, which could reduce the density of deer, resulting in improved herd health.

Deer hair-loss syndrome has been a concern in the Columbia River DPS, but has not been prevalent in the Douglas County DPS. This syndrome appears to be caused by a combination of internal and external parasites; internal parasites such as *Dictyocaulus viviparus* and *Parelaphostrongylus* spp. invade the lungs of infected deer, resulting in a low-grade pneumonia (Washington Department of Fish and Wildlife (WDFW) 1999; Biederbeck 2002). The pneumonia infection may suppress the deer's immune system, making infected deer more susceptible to external parasites. The disease is not necessarily fatal, but hair loss can result in death due to hypothermia in winter (WDFW 1999; Biederbeck 2002). Spotlight surveys by the ODFW noted 2 deer, out of 329 counted, with obvious hair loss problems (ODFW, *in litt.* 2001). Two marked deer on the NBHMA are known to have died with hair loss; an infected fawn was noted, but is not known to have died from the disease (ODFW, *in litt.* 2001). Deer hair-loss syndrome is not currently considered to be a threat to the Douglas County DPS, but the post-delisting monitoring program will include tracking the incidence of this disease.

In August 2001, a probable case of adenovirus, a viral disease, was identified through laboratory analysis in a Columbian white-tailed deer fawn in Douglas County. It is likely that the fawn contracted the disease while being held in a rehabilitation facility. This would be the first known incidence of this disease in white-tailed deer (Dr. Beth Valentine, Veterinary Diagnostic Laboratory, Oregon State University, *in litt.* 2001; Dr. Terry Hensley, D.V.M., U.S. Department of Agriculture, Veterinary Services, pers. comm. 2001). Adenovirus infection is potentially fatal to young deer, which may succumb to respiratory failure, hemorrhagic syndromes, or acute diarrhea and dehydration caused by the disease (Dr. T. Hensley, pers. comm. 2001). The disease has been previously detected in mule deer (*Odocoileus hemionus*) in northern California. An outbreak in the 1990s caused widespread mortality, but appears to have had no long-term effect on the population in California (Tapscott 1998). Therefore, we have determined that adenovirus is not a significant threat to the Douglas DPS. However, since its existence had been

confirmed in the Douglas County DPS, the post-delisting monitoring program will include tracking the incidence of this disease.

Predation is known to be a leading cause of death in white-tailed deer populations (Halls 1978). Ricca *et al.* (2002) studied survival of Columbian white-tailed deer fawns, and found that predation was the most frequent known cause of death for fawns in his study. Bobcats (*Lynx rufus*) were the dominant predator, and researchers found some evidence of predation by red foxes (*Vulpes vulpes*) and domestic dogs (Ricca *et al.* 2002). Coyotes (*Canis latrans*) are frequent predators of white-tailed deer elsewhere (Halls 1978), but recent research (Ricca *et al.* 2002) found no evidence of fawns killed by coyotes in Douglas County. The apparent absence of coyote predation may be due in part to the Wildlife Services predator control program at the U.S. Department of Agriculture Animal and Plant Health Inspection Service (APHIS). Douglas County contracts with APHIS, Wildlife Services, to conduct predator control. The program focuses mainly on coyotes, but also responds to fox, bobcat, and cougar (*Puma concolor*) complaints (Stan Thomas, District Supervisor, APHIS, Wildlife Services, pers. comm. 2001). The purpose of the program is to protect sheep and cattle ranching operations in the area, but it may also provide incidental benefits to the Douglas County DPS by reducing the number of potential predators on fawns. In summary, disease and predation are not considered threats to the Douglas County DPS.

D. *Inadequacy of existing regulatory mechanisms.* The lack of adequate Federal, State, or local regulatory mechanisms for protecting habitat and controlling take was largely responsible for the decline of the deer. Columbian white-tailed deer in Douglas County have recovered because Federal, State, and local governments have exercised their authorities to protect the subspecies and its habitat.

For example, the State of Oregon currently prohibits hunting of all white-tailed deer in western Oregon (described in Factor B, above). Delisting would provide the State with the flexibility to allow some regulated harvest to reduce population density if necessary to improve herd health.

Douglas County also provides important regulatory protection for Columbian white-tailed deer habitat on private lands through its Comprehensive Plan and Deer Habitat Protection Program (DCPD 1995; 2000a). The Comprehensive Plan addresses Oregon's Statewide Planning Goals.

Goal 5 requires local governments to conserve open space and protect natural and scenic resources for future generations; Douglas County's Columbian White-Tailed Deer Habitat Protection Program, which is described in more detail under Factor A, was established in 1980 under Goal 5 (DCPD 2000a). Statewide planning Goals 3 and 4 provide guidelines to maintain the rural landscape in Douglas County by protecting agriculture, timber, and transitional (farm/forest) lands. These goals were also incorporated into Douglas County's Columbian White-tailed Deer Habitat Protection Program, and also provide a measure of protection for deer habitat (DCPD 2000a). Douglas County's zoning and planning ordinances and county park designations are recognized in the Recovery Plan as valid methods to secure habitat, and will provide continuing regulatory protection of Columbian white-tailed deer habitat unless changed through a public process.

E. *Other natural or manmade factors affecting its continued existence.* There are a number of other threats to the survival of individual Columbian white-tailed deer in Douglas County. These include road kill, hybridization with black-tailed deer, emaciation, conflicts with private landowners, and fire.

Road kill is one of the major sources of mortality for white-tailed deer in the United States (Halls 1978). Ricca *et al.* (2002) concluded that road kill was the second most frequent cause of death in his study; they determined that five deer (17 percent of marked adult deer) over a period of 3 years were killed by vehicle collisions. Apparently, the incidence of road kill is fairly constant. Almost 20 years earlier, Smith (1981) found car collisions to be the second most frequent cause of death for deer in Douglas County. Although road kill is a major source of mortality for the Douglas County DPS, it has not been a limiting factor for population growth (D. Jackson, ODFW, pers. comm. 2001).

Hybridization between Columbian white-tailed deer and Columbian black-tailed deer has long been suspected to occur, and probable hybrids have been observed in Douglas County for many years (ODFW 1995). Biologists from the ODFW have noted evidence of hybridization (*i.e.*, deer with physical characteristics of both white-tailed and black-tailed deer), but concluded that the rate of cross-breeding is not a threat to the continued existence of the Douglas County DPS (Kistner and Denney 1991). Gavin and May (1988) conducted laboratory analyses of muscle samples from Columbian white-tailed