(Douglas 1904), timber wolves (Storm 1941), California condors (Gass 1904; Douglas 1955; see Fig. 13), and whitetail deer (Poesch 1961). It is assumed that most resident fish, bird, and mammal species found in the Willamette Valley were also present in Soap Creek Valley, at least on occasion or seasonal basis, because of the general range and extent of these animals (Storm 1941). Oral history informants list other extirpated species as well, although accuracy of individual observations cannot always be corroborated. Olson, for example, recounts the early 1900s killing of the "last wolf" in Soap Creek Valley, but quickly dismisses the account as a possible "story," or even "ghost story" (Olson 1994). Glender discusses extirpation of cutthroat trout (Glender 1994) and Rohner describes elimination of jackrabbits (Rohner 1993), but it is unknown whether these animals maintained relict populations in the area, were reintroduced within a few months or years, or remain locally extinct.

Methods of corroborating or refuting oral history and journal accounts of wild animals include photographs, scientific reports, and field inventories. A photograph provided by Grabe (see Table 1; Grabe 1990), for example, shows the results of a hunting expedition in Soap Creek Valley during 1899 (Fig. 14) and provides evidence of local bear, skunk, and deer populations. Two wildlife biologists (Sondenaa 1989: personal communication, C. Chambers 1993: personal communication) have examined the photograph and concluded one of the animals may have been a wolverine. If so, it was one of the last wolverines documented in western Oregon (Ingles 1992).

The record of animal extinctions in western Oregon precedes the beginnings of human occupation in Soap Creek Valley by millions of years, as evidenced by widespread occurrence of marine fossils in the area (Orr, et al. 1992). During the past 500 year period this process has apparently been hastened by introduction of guns and steel traps in the Willamette Valley (Fagan 1885; Storm 1941) that followed establishment of Fort Astoria in 1810. Since settlement of Soap Creek Valley in the mid-1840s, extirpations have been further accelerated by human actions, including hunting (Olson 1994), fishing (Glender 1994), trapping (Dickey 1995), habitat alteration (Rohner 1993), introduction of predatory carnivores (e.g., cats, dogs, foxes) (Storm 1941; Olson 1994; Murphy 1995), and game animal stocking (e.g., rainbow trout, bobwhites, and Chinese pheasants) (Storm 1941; Glender 1994; Olson 1994).

Fig. 12. Hanish Forest Peak obsidian biface.
Top Photograph. James Hanish and his mother, Connie, at their Berry Creek home (see Map 2; Hanish 1994) in the mid-1930s, about the same time he discovered the obsidian biface shown in the lower photograph. (Photographer unknown; possibly James' father, Fred Hanish.)
Bottom Photograph. This artifact provides evidence of early human use and occupation of Soap Creek Valley. Discovered in mid-1930s by James Hanish in new logging road cutbank near summit of Forest Peak (see Map 2; table 2), approximately 3 feet below ground surface level (Hanish 1994). The discovery of the biface's existence by OSU researchers in 1990 was partly responsible for special management consideration of Forest Peak area by OSU Research Forests (Zybach et al. 1990; OSU College of Forestry Forest Planning Team 1993), and led directly to the discovery of other ancient artifacts by student employees in the same vicinity during the early 1990s. Photograph by author.

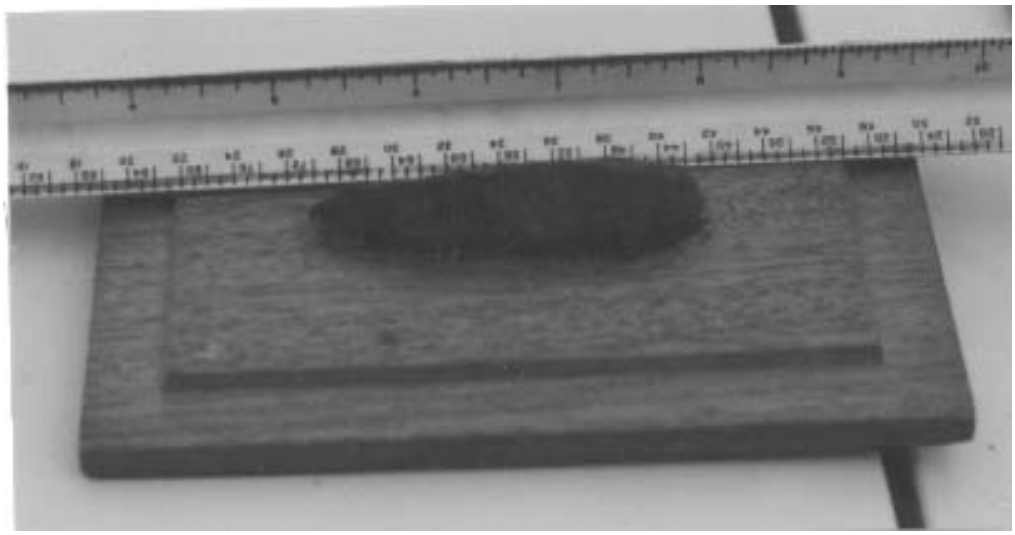

Fig. 13. Lewis sketch of California condor head, 1806. Drawing made from live bird captured near present-day Astoria, Oregon by members of Lewis and Clark expedition (Thwaites 1959). At that time, condors ranged northward into Washington State, east as far as present-day Dalles, Oregon (Gass 1904), throughout the Willamette Valley, and along the Oregon Coast (Davies 1961). Douglas reported condors along the Columbia River and in the Willamette Valley in 1825, and described Hudsons Bay Company (HBC) trappers as prizing condor quills for use as pipe stems (Douglas 1905).

Appendix E lists wild terrestrial vertebrates native to Soap Creek Valley, including those extirpated from northwest Oregon (and thus, Soap Creek Valley) since 1805, the year Lewis and Clark first entered the Pacific Northwest and began making detailed descriptions of local plant and animal species (Thwaites 1959; see Fig. 12). Table 12 provides a summary of Tables E.1 and E.2. Most extirpated vertebrate species were purposely exterminated because of perceived threat to humans, their pets, and/or livestock: e.g., grizzly bears, wolves, wolverines, rattlesnakes, and cougar—which latter species has subsequently returned (see Rowley 1996); were systematically eliminated because of their value for sport, meat, or fur: e.g., beaver, elk, ermine, whitetail deer; or were reintroduced for similar values: e.g., beaver (see Storm 1941; Fig. 15) and elk (Sondenaa 1991; personal observation). Note that exterminated vertebrates are chiefly large carnivores and introduced wild vertebrates are primarily rodents, herptivores, and marsupials.

Fig. 14. Soap Creek Valley wildlife inventory, c.1899. Photograph taken by Sam Moore, early Soap Creek Valley resident (Sondenaa 1991; Zybach 1992b; Zybach 1994). Note variety of people, pets, mammal carcasses and second growth Douglas-fir forest in the background. This area of Soap Creek Valley, including young timber, was described as "prairie" in original 1850s land surveys (Freeman 1852; Hyde 1852a; Hyde 1852b; Ives 1852; Elder 1853). Background ridge is visible to SW (left) of Writsman Hill (see Map 2). Printed by permission of Soap Creek Schoolhouse Foundation (Grabe 1990).

Animal Introductions (1806-1999)

Prior to the arrival of people, new animal species appeared in Soap Creek Valley by migration, expansion of range, or (possibly) by evolutionary development. During historical time, virtually all wild animal introductions have been a direct result of human actions (Glender 1994; Olson 1994; Murphy 1995). The first explorers arrived in 1826 by horseback and established trails subsequently used by cattle drivers and sheep herders in the 1830s (Carey 1971). Settlers in the 1840s and 1850s purposely and inadvertently introduced new species of mice and rats, swine, goats, domesticated fowl, and pet cats and dogs. In the early 1880s, and continuing until the 1990s, fish and game managers

Table 12. Native and exotic wild terrestrial vertebrates, 1805-1999.

Order	Native	Extirpated	Exotic
Frogs	2	0	1
Lizards	3	0	0
Salamanders	5	0	0
Snakes	6	1	0
Toads	1	0	0
Turtles	2	0	1
Carnivores	13	4	1
Deer/Elk	2	1	0
Insectivores	8	0	0
Marsupials	0	0	1
Rabbits/Hares	2	1	1
Rodents	20	0	2
12 Orders	64	7	7

Native — Number of species present in The Valley before 1806 or after 1989
Extirpated — Species present before 1806, but locally extinct more than 10 years.
Exotic — Species introduced to Soap Creek Valley since 1805.

introduced exotic birds, beaver, elk, and trout. Many game animals, including pheasants, turkeys, and cottontails, were introduced by accident, through the proximity of the Oregon State Fish and Wildlife Department's E. E. Wilson Game Ranch, across Highway 99 W. from Coffin Butte (Webber 1996: personal communication).

Today, many Soap Creek Valley residents keep a variety of pets, which include dogs, cats, birds, fish, horses, reptiles, amphibians and insects (Miller 1996: personal communication). In instances of introduced game animals, local populations are usually encouraged to become naturalized; in other instances, domestic pets and livestock have gone "wild" on their own accord. There is at least one documented example of OSC researchers establishing a population of beaver, which had been previously extirpated by trappers (Storm 1941; Glender 1994; Olson 1994). Experimental fish ponds in central Soap Creek Valley (see Map 2; Table 2) hold populations of exotic warm water fish, also established by OSU research (Zybach et al., 1990). In these ways, goats were introduced, became feral, and were then extirpated from Soap Creek Valley forestlands (Jackson 1980; Rowley 1990: personal communication; Rowley 1996), possum populations became established and have increased in numbers (Sondenaa 1991), turkeys (Stouder 1995), Chinese and elk (Sondenaa 1991) have been stocked and hunted

in season, and planted rainbow trout, more aggressive in their feeding habits than their native cousins, are thought to have replaced cutthroat trout in most Soap Creek Valley creeks (Glender 1994).

It is difficult to determine if some species are native or naturalized. For example, Lewis and Clark reported red fox in western Oregon in 1805 (Thwaites 1959). Douglas reported that red fox were not found in western Oregon in the 1820s, although a close relative, the tree-climbing gray fox, was common (Douglas 1905). Douglas is supported by Glender (1994), who trapped several gray foxes in the 1930s and a single red fox "with a collar on it," indicating that it was an escaped pet. Glender's account is supported by Murphy (1995), who blamed the demise of local grouse populations on introduction of red foxes by local hunters in the early 1900s. Storm (1941) disagrees, stating the red fox was native, "though quite uncommon," and blames reduced "sooty" grouse numbers on hunting. Ingles (1992), however, supports both accounts, claiming red fox native to the high Cascades of Oregon and Washington, but introduced "from the southern United States" to many counties in northwest Oregon (including, presumably, Benton County and Soap Creek Valley). A few other animals, including fish and birds, and many vascular plant species, chiefly grasses, have a similarly confused ancestry in Soap Creek Valley.

Summary. Since 1825, introduced domestic, sport, and feral animals have had a direct effect on local forest cover patterns by displacing (and/or restricting the range of) native species (Storm 1941; Kay 1996). Table 12 summarizes some basic demographic patterns related to wild vertebrate species' numbers, locations, and associations. As shown in Table 12, since settlement of Soap Creek Valley, the number of introduced species has been roughly equal to the number of extirpated species. Reintroductions of animals have been limited generally to species with perceived sport or fur value; although cougar, and possibly some elk and/or beaver, have returned on their own accord ("reintroduction," in this latter sense, is interpereted as "allowed to return"). Populations of individual species have varied dramatically over time, as in instances of irruptions, killing snows, trapping projects, or disease epidemics.

Fig. 15. Baker Creek beaver ponds, 1990. OSU Wildlife biologist, Angela Sondenaa (see table 5) provides human scale to beaver pond-building on OSU Research Forests' Baker Creek property (see Maps 2 and 3; Tables 2 and D.4) Note logs and beaverslide on far bank. Photograph by author.

Plant Introductions (1826-1999)

In common with wild vertebrates, most introductions of wild Soap Creek Valley vascular plant species are the result of human actions, both purposeful and accidental. Purposeful introductions include annual plantations of agricultural crops (Rohner 1993; Murphy 1995), and perennial plantations of fruit and nut orchards (Glender 1994; Olson 1994; Cook 1995; Murphy 1995), chittum (Olson 1994), ash (Garver 1996: personal communication), and conifers (Starker 1984; Wakefield 1989: personal communication; Rowley 1996). Accidental, or unplanned, introductions include weeds and wildings: e.g., bachelor buttons (Rohner 1993), hairy vetch (Glender 1994), orchardgrass (Murphy 1990) and Hardinggrass (Rohner 1993), herb Robert (Hays 1990: personal communication), dandelions, and scotchbroom (Grabe 1990).

In addition to plantations, introduced tree species include wilding fruit trees (Rohner 1993; Glender 1994), principally pears, plums, cherries, and apples (see Fig. 16); wilding landscape trees, including English holly and silver maple (Zybach et al., 1990); and naturalized progeny of off-site conifers, chittum, and pine plantations (Rowley 1996). Most fruit and landscape tree wildings located in Soap Creek Valley occur adjacent to roads and fields, fencelines, creeks, old orchards, and abandoned homesites (Gu 1991: personal communication), although scattered specimens are found occasionally in openings throughout forested areas (personal observation).

Table 13 summarizes the types and numbers of species of wild vascular plants identified in Soap Creek Valley since 1826. Douglas (1905) encountered many species and specimens that had existed for decades or centuries, as evidenced by tree ring counts (Starker 1939; Rowley 1996) and surveyed 1850s "Bearing Tree" (BT) diameters (see Appendix F). Exotic grasses, orchards, annual crops and conifer plantations have resulted in changes in horizontal and vertical landscape in Soap Creek Valley vascular plant cover patterns since settlement. Exotic plants are predominantly grasses and forbs, existing as weeds in cultivated areas and understory vegetation in forested areas (Johnson 1996: personal communication). As shown by Table 13 totals, species "richness," a measure of wildlife diversity that simply totals the number of different species within an area (Kimmins 1987), has increased dramatically for wild Soap Creek Valley vascular plants in the past 170 years. (Another significant measure of plant diversity, species "importance" (Kimmins 1987), is discussed in Chapter V.)

Plant Migrations (1500-1999)

Vascular plant species have moved into Soap Creek Valley, and from place to place within its boundaries, through plantings and seeding by people and by natural seeding and sprouting processes that precede human history. Two major results of Soap Creek Valley plant migrations during the past 500 years have been the afforestation of oak savannah and grassy prairies (see Fig. 17) during the past 170 years and the expansion of Douglas-fir populations and range during the past 350 years. These processes have resulted in a general shift in species importance

Fig. 16. Pioneer apple trees, 1947-1999.
Top Photograph. Robert Wilson apple tree blossoms. This photograph was taken in 1947 by OSC student, Robert Wilson. The photograph was made available to OSU student researchers in 1990, who subsequently named the tree in honor of the photographer (Zybach et al., 1990). Ten, or more, pioneer orchards still exist in Soap Creek Valley, many still producing fruit or nuts 100 to 150 years after their establishment. Hundreds of wilding cherry, apple, pear, walnut, and plum trees in The Valley may be descended from these pioneer plantings (Compton 1990: personal communication; Gu 1991: personal communication).
Bottom Photograph. Letitia Carson pioneer apple tree, June 12, 1999. This tree was named in honor of a pioneer black resident, who lived in the area of this tree in the 1840s and 1850s, and may have even planted it (Cook 1995). The name was given by student researchers completing a cultural resources inventory of OSU properties in Soap Creek Valley (Zybach et al., 1990). Photograph by author.

Fig. 16