

## **Pest Risk Assessment for Feral Swine (*Sus scrofa scrofa*) in Oregon**

### **Identity**

**Name:** *Sus scrofa scrofa*

### **Taxonomic Position**

**Phylum:** Chordata

**Class:** Mammalia

**Order:** Artiodactyla

**Family:** Suidae

**Common Names:** wild pig, wild swine, feral hog, feral swine, wild boar, Russian boar, and razorback.

**Risk Rating Summary- Relative Risk rating:** Very High

**Numerical Score:** 9 (On a scale of 1-9)

**Uncertainty:** Very Low

Feral swine were classified as very high-risk species in a pest risk assessment developed for the OISC (Coblentz and Bouska 2004). The risk assessment concluded that the threat of destruction to natural habitat, agriculture, and livestock in Oregon is imminent without action. Currently, feral swine populations in Oregon are in isolated areas that are far from intensive agriculture and livestock production, thus Oregon has not experienced the deleterious effects of feral swine populations that plague other areas of the world with similar habitat.

### **Introduction:**

Feral swine are defined as free roaming animals of the genus *Sus* that are not being held under domestic management or confinement. Swine have spread from Europe and Russia to habitats around the world via human introduction. Currently, feral swine populations are established on every continent except Antarctica. Unlike other large mammal invaders, swine have a high reproductive capacity and are omnivorous, which allows for a quick assimilation into most habitats.

Population of feral swine have been reported in 17 counties in Oregon:

- Josephine County (Rough and Ready Creek)
- Coos and Curry Counties (Dement Creek/Sixes River area, Pistol River, and Thomas Creek)
- Jackson County (Sampson, Slide, and Conde Creeks)
- Klamath County (Swan Lake Ridge, Klamath River)
- Wasco and Jefferson Counties (Ashwood area)
- Crook County (Ochoco National Forest)
- Wheeler County (Spray/Service Creek/Waterman Triangle area(2))
- Harney, Malheur, Grant, Morrow, Douglas, Gilliam, Sherman, Lake

Increasing population and the spread of feral swine in Oregon are due to a combination of unauthorized releases for hunting and escapees from domestic swine operations. The wild boar traits in the south coast feral swine suggest that they may have been intentionally released or escaped after importation of wild boars to Oregon or that they are immigrants from the expanding population in Northern California. Feral swine in the eastern and southern counties

are less aggressive, which suggests that they are escapes or intentional releases of domestically raised swine. Presence of small feral swine populations for long periods prior to rapid and large population expansion is a common phenomenon. Indeed, long latent periods prior to population explosion is common for invasive species in general (Williamson 1996), and lack of major feral swine impacts in Oregon to date is not a good predictor of the likelihood of impacts in the future. Current feral pig distribution and numbers in Oregon are still limited and it is probable that the existing populations could be eradicated with reasonable costs and efforts. With the exception of the counties bordering California (where feral pig numbers continue to increase) feral swine can be eradicated from Oregon. For counties bordering California the best we can do is to contain them, due to the large population of feral swine in California that can migrate into Oregon. Continual management and eradication efforts will be necessary to keep feral pigs from re-populating Oregon counties.

**Recommendation:**

Feral swine populations in Oregon are currently at levels similar to those in California 50 years ago. Left unchecked, feral swine populations are likely to grow and cause ecological, economic, and human health impacts in Oregon. Evidence from the Galapagos Islands, Channel Islands, and from Post, Oregon indicates that feral swine can be eradicated. Furthermore, the case studies demonstrated that efforts to control or manage (not eradicate) populations typically fail. Our current understanding of feral swine population size and distribution in Oregon is limited; however, known populations in eastern and southern Oregon can be eradicated.

Actions to prevent the effects of an invasion fall into three categories: management, control or eradication. Of the three categories, only eradication efforts have successfully slowed or reversed the effects of swine invasions. Feral swine reproduce quickly; it would take a 70% harvest rate each year just to maintain the population at its current level. Recreational hunting is often used as a management tool but studies have found that even with unlimited hunting, hunters are only able to remove up to 40-50% of a population each year. To be successful, any management response will require a long-term commitment and application of a suite of control techniques used in an adaptive manner.

**Risk Rating Details- Establishment Potential: High**

**Justification:**

Feral swine are a very high risk invader because they easily become established in a variety of habitats, they cause great environmental and economic damage, and they can transmit disease to wildlife, livestock and humans. Feral pigs are extremely adaptable and are expected to be able to exploit nearly every habitat type in Oregon. "Feral pigs have invaded every continent except Antarctica." (5) Among the habitats exploited are urban and suburban areas; the pigs are not deterred by the existence of humans or their infrastructure. Pigs can also be found in rural agricultural areas.

**Spread Potential: High**

**Justification:**

Feral swine have successfully established populations nationwide. Oregon is poised to be the next area taken over by feral pigs. The animal's adaptability, ability to exploit many different types of habitats, and resultant destruction of cultivated and native vegetation make pigs a "high risk" invader. Pigs easily reproduce in all habitats they have exploited. It is expected that they would have no trouble becoming established in all regions and habitat types within Oregon.

Feral pig populations are currently small and isolated in southern and central Oregon. They could, however, successfully inhabit any region west of the Cascade Mountains where food and water is available. The only limiting factor for wild pigs is elevation. At high elevations, food and water is limited, thus limiting the ability of pigs to survive. Pigs would not be able to live in the highest parts of the Cascade Range. Riparian areas, golf courses, irrigated fields, and pastures are areas most susceptible to range expansion of feral pigs in the drier regions of Oregon.

### **Environmental Impact Potential: High**

#### **Justification:**

Feral swine spend a considerable amount of energy rooting (or grubbing) beneath the soil surface in search of bulbs, tubers, roots, and earthworms and other vegetative and invertebrate food items. Rooting activities typically occur in the uppermost 25 cm of the soil layer (5). This mixes the surface organic soil horizons until they are no longer distinguishable from one another and significantly reduces the litter layer. Rooting negatively affects fauna and invertebrate communities by essentially removing their habitat.

Competition with native wildlife for food resources, especially mast, is a valid concern given the rates of consumption of which feral pigs and wild boar are capable, e.g. 1300 lbs mast/year per adult (6). Feral pigs ingest mostly plant material, but animal material is common as well. They are known to prey on the nests of ground-nesting birds. In Switzerland and Luxembourg, increases in wild boar populations were correlated with decreases in woodcock (*Scolopax rusticola*) populations (5).

Feral pigs have significant negative impacts on the environment including:

- Restriction of timber growth
- Elimination of under story vegetation
- Soil compaction, erosion, and destabilization
- Reduced water quality in streams
- Facilitation of noxious weed growth
- Predation on other animals (5)

In addition to these impacts, pigs can severely affect, Oregon White oak (*Quercus garryana*), one of Oregon's most fragile species. Pigs eat nearly all of the acorns dropped by the oaks; this has direct effects on wildlife that use these acorns as a main food source. In addition to the effects on other animals, it negatively affects Oregon white oak by reducing their potential for regeneration (2).

To date, there have been no studies of the impacts of feral pigs in Oregon. However, they undoubtedly affect understory cover, soil qualities, water and stream quality, and exotic plant

invasion in ways similar to those described from other regions. The results include alteration of nutrient cycling pathways and successional patterns. (5)

### **Economic Impact: High**

#### **Justification:**

Agriculture in Oregon is a \$3.6 billion/year industry that could be dramatically affected if feral swine become successfully established in Oregon (5). Irrigated pastures and alluvial vegetation possess important nutritive value, especially during seasons of drought. Wild pigs will most likely dominate these areas which would have significant negative impacts on livestock and wildlife that depend on irrigated pastures.

Pigs in California and southern states such as Texas and Louisiana are hunted for recreation, providing income to the states and to private hunting reserves. Hunting pigs for recreation has halted eradication efforts in some areas so that outfitters and private landowners who lease lands for hunting can continue to reap financial benefits.

Agricultural areas where pigs feed are dramatically affected. Each year in the U.S., wild pigs cause \$800 million in damages to croplands. As feral swine populations increase, this figure is expected to rise. In addition to damaging crops, pigs can damage livestock through disease transmission. Feral swine are vectors for many diseases that can kill livestock, wildlife, and humans.

The cost of pig control is significantly lower than the cost of the negative economic and environmental impacts they cause. Currently, control techniques in Oregon cost about \$1 million per year. The methods for eradication are labor-intensive, but are vital to keeping the population under control and to avoid further economic impacts. If the population becomes too large, relatively economical control methods will no longer be possible and Oregon will suffer the same economic consequences as do other states and nations.

### **Human Health Impact Potential: High**

**Justification:** Feral swine carry a wide range of diseases that can affect livestock, wildlife, and humans. Feral swine are susceptible to twenty-four different diseases which can be transmitted to other species. A recent example involves the presence of swine excrement on spinach fields in California. The excrement, which contained *Escherichia coli*, contaminated the spinach and resulted in the deaths of 3 people and sickening of 200 others in the U.S. and Canada (11). Diseases affecting humans that can be spread by feral swine include brucellosis, balantidiasis, leptospirosis, salmonellosis, toxoplasmosis, trichinosis, trichostrongylosis, tuberculosis, tularemia, anthrax, rabies, and plague (5).

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