

**Forestry Program for Oregon Strategy F: Protect, maintain, and enhance the health of Oregon's forest ecosystems, watersheds, and airsheds within a context of natural disturbance and active management.**

**F b. Invasive species trends on forest lands**

**Why is this indicator important?**

Invasive species constitute a major threat to the integrity of native forest ecosystems. Oregon's mild climate coupled with recent increases in commerce and population has facilitated the introduction and spread of invasive pests. Invasive species reduce the diversity found in native forests and adversely affect populations of native species through predation, competition, altered fire regimes, or destruction of habitat. Exotic pests can have significant economic impacts by direct damage to natural resources or the loss of markets through quarantine regulation. Monitoring the detection, spread and eradication efforts for new invasive pests can provide an early warning to policy makers and the public on species that threaten native and urban forests.

**Desired trend**

*No invasive species on Oregon's "100 Most Dangerous" list are uncontained in the state's forests, and a stable or decreasing forest acreage is affected by invasive species.*

## What does this indicator tell us about sustainable forest management?

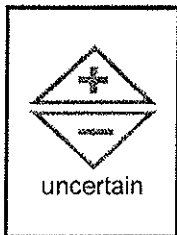
### State



In 2007, exclusion efforts for invasive species in Oregon met the target of less than one failure for the Oregon Invasive Species Council (OISC) "100 most dangerous." In the six years since this benchmark was established, only one species from the list of invasive species has become established (New Zealand mudsnail) with one other recently deemed in danger of becoming established (feral swine). Surveys for many of the highest priority invasive species were completed by state agencies and eradication projects targeting 10 listed recently introduced species are being carried out. These include: treatment of the pathogen *Phytophthora ramorum* (sudden oak death); insect pests including granulate ambrosia beetle, gypsy moth and Japanese beetle, and several invasive weed species.

The Oregon Department of Forestry-USDA Forest Service cooperative aerial survey of Oregon forest lands estimated that established invasive insects and diseases occurred on an average of over 97,000 acres per year from 2003-2007. The predominant agents were defoliating and sucking insect pests and damage was greater in eastern than in western Oregon. Recent infestations have occurred primarily on federal forest lands. Trees affected included true firs, Sitka spruce, five-needle pines, Port Orford cedar, and western larch. Average infested acreage was 72 percent higher than the previous 5-year average, which is due to both pest expansion as well as the development of better aerial survey detection methods.

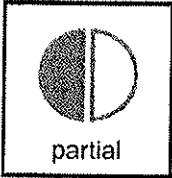
### Trend



The OISC "100 most dangerous" invaders list is based on the consensus of state and federal scientists, and as such, the list is subjective and may frequently change, making trend analysis difficult. Detection and eradication efforts against invasive species appear to have consistently improved since 2002, but as Oregon continues to be subjected to new invasive species which have varying potential to destroy forest resources or affect quarantine, it is difficult to predict future trends. The addition of a state invasive species coordinator and expansion of activities by OISC and state agencies will continue to improve detection efforts and our state of knowledge.

Cooperative aerial survey observations of invasive insects and diseases is available going back several decades, but detection of these pests has often been obscured by weather, host development or survey timing. As such, annual results are highly variable and better expressed as 5-year averages. For many invasive species, long-term trends can be deceptive as the large numbers of hosts are frequently damaged or killed, and thus detection can decrease in relation to early stages of infestation while the invasive continues to expand. Interpreting current results and predicting future trends will likely continue to be difficult.

### **Information**



Data on invasive species in Oregon is generally quite limited. The Oregon Departments of Agriculture and Forestry conduct annual trapping and monitoring efforts for high priority invasive pests and provide information on detections and ongoing eradication efforts. The OISC produces an annual list of the "100 most dangerous" invaders and a report card/rating of current exclusion efforts. These programs are well supported and can be expected to continue to provide information. Annual aerial surveys and periodic ground surveys of forest lands provide information on some previously established invasive insects and diseases, but are insufficient to detect new arrivals. No source has been identified that could provide statewide data on the distribution and abundance of invasive plants on forest lands.

### **Metrics and Data Sources**

<b>Metric</b>	<b>Data Source</b>
Annual exclusion and containment record (report card) for OISC "100 most dangerous" invasive species	Oregon Dept of Agriculture Oregon Invasive Species Council Oregon Dept of Forestry
Estimated area affected (acres) by recently introduced and established invasive insects and disease (5-year average)	Oregon Dept of Forestry USDA Forest Service Forest Health Protection & Forest Health Monitoring

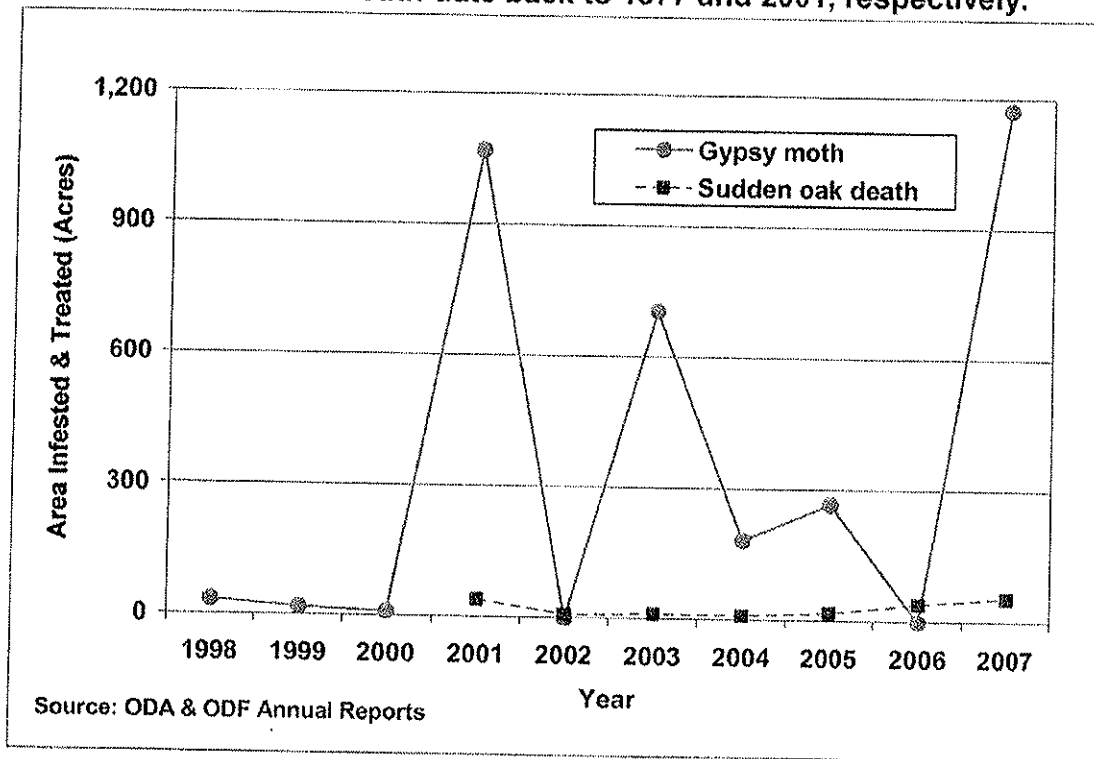
**Table 1- The Oregon Invasive Species Council (OISC) exclusion and containment record for the “100 most dangerous” invasive species in Oregon, number of significant detections and actions taken, and overall annual rating (2002-2007).**

<u>OISC ANNUAL REPORT</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>
Number of OISC “100 most dangerous” invasive species successfully excluded or contained	97	98	99	99	99	99
Number of important invasive species detections & actions taken <sup>1</sup>	25	30	28	41	37	n/a <sup>2</sup>
Invasive species exclusion annual “report card” rating for Oregon	C+	B	B	A-	A-	A

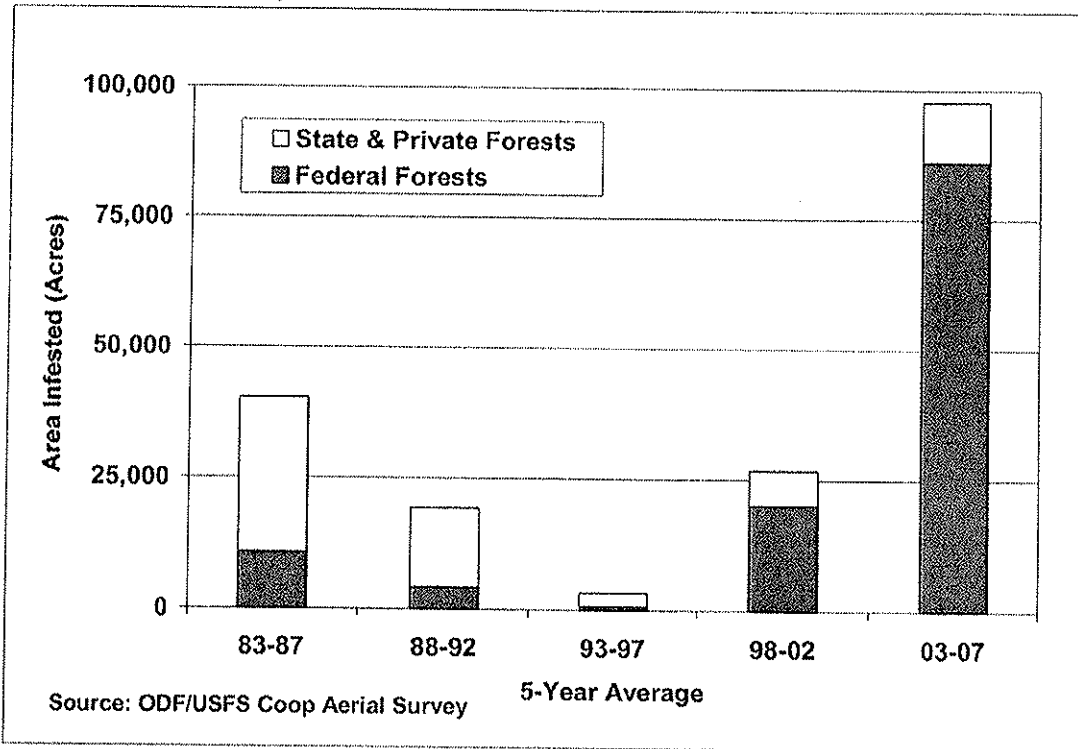
<sup>1</sup> Does not reflect detections at ports of entry, only involves species that have already penetrated the national border protection system. Important species detections are high priority invasives found by trapping, surveys or notification from public or private entities. Actions taken generally refer to eradication efforts or the enacting of a quarantine area.

<sup>2</sup> Data are not available. Prior to this year, the annual report card focused on the success in keeping species from being established in the state. In 2007, a committee within OISC has been created to develop new grading criteria which reflect not just the state of invasives at the state scale, but also the work of the council in each of its five missions.

Figure 1—Estimated area (acres) infested by two significant invasive species in Oregon forests, gypsy moth and the pathogen (*Phytophthora ramorum*) responsible for sudden oak death. Eradication efforts for gypsy moth and sudden oak death date back to 1977 and 2001, respectively.



**Figure 2 – Five-year averages for the area (acres) estimated to be infested by established invasive insect and disease species in Oregon forests (1983-2007)<sup>1</sup>. These include balsam woolly adelgid, larch casebearer, spruce aphid and satin moth insect pests, as well as Port Orford cedar root disease and white pine blister rust.**



<sup>1</sup> Five-year averages are provided due to the high degree of annual variation in invasive insect and disease detection. Recent increases in detection reflect the development of better aerial survey detection methods as well as pest expansion. Typically, eradication projects target recently introduced invasive species and not established species.