Whitebark Pine (*Pinus Albicaulis*) 12-Month Finding
Questions and Answers

What action is being taken today?
The U.S. Fish and Wildlife Service (Service) is announcing today it has determined the whitebark pine (*Pinus albicaulis*) warrants protection under the Endangered Species Act (ESA), but that adding the species to the Federal List of Endangered and Threatened Wildlife and Plants is precluded by the need to address other listing actions of a higher priority.

What is a status review?
A status review, also known as a 12-month finding, makes public the Service's decision on a petition to list a species as threatened or endangered under the ESA. The finding is based on a thorough assessment of the available information on the species, as detailed in the species' status review. One of three possible conclusions can be reached as part of the finding: that listing is warranted, not warranted, or warranted but presently precluded by other higher-priority listing activities involving other species.

What is the status review finding regarding whitebark pine?
After evaluating all the available scientific and commercial information regarding whitebark pine, the Service has determined protection under the ESA is warranted. However, listing whitebark pine at this time is precluded by the need to address other listings of higher priority.

Whitebark pine will be added to the list of candidate species under the ESA and will be proposed for listing when funding and workload priorities for other listing actions allow. As a candidate species, its status will be reviewed annually. If the Service proposes the whitebark pine for listing in the future, the public will have an opportunity to comment. While candidate species receive no statutory protection under the ESA, inclusion on the candidate list promotes cooperative conservation efforts for these species.

The Service is assigning the whitebark pine a listing priority number (LPN) of 2, which means the agency has determined the threats are of high magnitude and are imminent.

How does the Service determine whether a species needs to be listed under the ESA?
Under section 4 of the ESA, species are determined to be threatened or endangered because of one or more of the following five factors:

1) present or threatened destruction of habitat;
2) overutilization;
3) disease or predation;
4) inadequacy of existing regulations for protection; and
5) other natural or human-made factors.

In order to be considered a threat, a substantial demonstrable effect should be shown to play a significant role in the population dynamics of the species such that it is likely to become an endangered species within the foreseeable future throughout all or a significant portion of the range.

Where is whitebark pine found?

Whitebark pine typically is found on cold and windy high-elevation or high-latitude sites in western North America. Roughly 44 percent of the species' range occurs in the United States in Wyoming, Montana, Idaho, Nevada, California, Oregon, and Washington. The remaining 56 percent of the species range occurs in British Columbia and Alberta, Canada. Whitebark pine is a non-commercial conifer occurring primarily on federally owned or managed lands in the United States and mainly on privately owned lands in Canada.

Why is whitebark pine important?

Whitebark pine is considered a keystone species in high elevation ecosystems because it increases biodiversity and contributes to critical ecosystem functions. Whitebark pine is frequently the first conifer to become established after disturbances like wildfires and subsequently stabilizes soils and regulates runoff. Snow will drift around whitebark pine trees, thereby increasing soil moisture, modifying soil temperatures, and holding soil moisture later into the season. Whitebark pine also provides important, highly nutritious seeds for numerous birds and mammals. In addition to these important contributions to high elevation ecosystems, whitebark pine forests have a high esthetic value that is prized by backcountry hikers and other recreational users.

How is whitebark pine distinguished from other western pine trees?

Whitebark pine is a 5-needled conifer species placed in the subgenus *Strobus*, which also includes other 5-needled white pines. Whitebark pine is a stone pine (so-called for their stone-like seeds). Only five species of stone pines are recognized worldwide, and whitebark pine is the only stone pine that occurs in North America. Characteristics of stone pines include five pine needles per cluster, cones that stay on the tree, and wingless seeds that remain fixed to the cone and cannot be dislodged by the wind. Because whitebark pine seeds cannot be wind-disseminated, primary seed dispersal occurs almost exclusively by Clark's nutcrackers (*Nucifraga columbiana*) in the avian family Corvidae (whose members include ravens, crows, and jays). Consequently, Clark's nutcrackers facilitate whitebark pine regeneration and influence its distribution and population structure through their seed caching activities. Whitebark pine is a very long-lived species with some individuals documented at over 1,000 years old. Amazing to think some of these trees were seedlings in 1,000 A.D.!

If the whitebark pine is listed in the future, what activities could be impacted?

Due to the generally remote nature of the high-elevation habitat that whitebark pine occurs in, the Service expects few activities would be directly impacted by a future listing. However, the Service will continue to work with the U.S. Forest Service and other partners to develop strategies to address the threats. Plans for activities by government agencies in whitebark pine habitats would be analyzed for impacts to the species, and potentially altered to reduce or remove adverse impacts. This does not mean activities that impact whitebark pine will be excluded from its habitat. In practice, most activities proposed in habitat occupied by endangered or threatened species can occur without change or with minor changes to ensure impacts to listed species are minimized.

Although the primary threats to whitebark pine of blister rust and mountain pine beetle can be exacerbated by environmental changes resulting from climate changes due to both natural and human-caused factors, the Service does not anticipate measures to address climate change would result from listing the whitebark pine. None of the Service's statutory or regulatory authorities provide an appropriate mechanism to regulate greenhouse gases, nor does the Service have the ability to do so. However, the Service will work to ameliorate the synergistic effects of climate change on mountain pine beetle and blister rust by addressing those threats directly through increased research and best management practices to prevent spread.

If whitebark pine declines, what does this mean for grizzly bears?
Some grizzly bears use whitebark pine seeds extensively when these seeds are available. However, whitebark pine's life cycle does not result in seed production every year. In some years, few if any whitebark pine seeds are available for grizzly bears. Because whitebark seeds are not a naturally reliable food source, grizzlies have been coping for millennia by switching to other foods when whitebark pine seeds are unavailable by consuming other readily available foods such as ungulates, ground squirrels, insects, roots, mushrooms, and other vegetative matter.

The Service has 25 years of data from monitoring the survival, reproduction, and movements of radio-collared grizzly bears in the Yellowstone ecosystem that demonstrate even in years of no whitebark pine seed production, the grizzly bear population continues to increase, albeit at a slower rate than in years of high whitebark seed production. Decades of intensive research and monitoring data, coupled with information about the diet diversity and flexibility of grizzly bears, supports the conclusion grizzly bears will be able to cope with the decline of whitebark pine. In summary, grizzly bears are not a species specialized on whitebark pine seeds, and they are not dependent on whitebark pine seeds for their survival.

What threats did the Service identify for whitebark pine?
The following threats were identified as having a substantial demonstrable effect on whitebark pine throughout its range.

White pine blister rust: White pine blister rust is a disease of whitebark pine and other western pines caused by a nonnative fungus, *Cronartium ribicola*. White pine blister rust kills all age classes of whitebark pine. White pine blister rust can kill small trees within 3 years, and even one canker (infected area) can be lethal. While some infected mature trees can continue to live for decades, their cone-bearing branches typically die, thereby eliminating the seed source required for reproduction. White pine blister rust was introduced into western North America in 1910 near Vancouver, British Columbia. Today it is nearly ubiquitous across the range of whitebark pine. White pine blister rust is now prevalent in even cold, drier areas of the whitebark pine range that were originally considered less susceptible.

Mountain pine beetle: The native mountain pine beetle is a true predator of whitebark pine and other western conifers because to successfully reproduce, the beetle must kill its host tree. Mountain pine beetles are considered an important component of natural forest disturbance. At endemic or 'natural' levels, mountain pine beetle remove relatively small areas of trees, changing stand structure and species composition in localized areas. However, when conditions are favorable, mountain pine beetle populations can erupt to epidemic levels and create stand-replacing events that kill 80 to 95 percent of suitable host trees.

Recent warming trends have provided the favorable conditions necessary for the current, unprecedented mountain pine beetle epidemic in high elevation communities across the western United States and Canada. Millions of acres have already been impacted. Populations of whitebark pine once considered mostly immune to mountain pine beetle epidemics are now being severely impacted; mountain pine beetles have now moved into areas previously climatically inhospitable for epidemic-level mountain pine beetle population growth.

Fire Suppression and Catastrophic Fire: Wildfire has historically been an important factor in maintaining healthy stands of whitebark pine on the landscape. Without regular disturbance, primarily

from fire, these forest communities follow successional pathways which eventually lead to dominance by shade tolerant conifers such as subalpine fir, lodgepole pine, and mountain hemlock. When fire is present on the landscape whitebark pine has an advantage over its competitors. Due to fire suppression policies implemented in the 1930s and still carried out to some degree today, stands once dominated by whitebark pine have undergone succession to these more shade-tolerant conifers.

This change has led to dense tree stands with continuous crowns and increased surface fuels, which ultimately results in damaging wildfires that are larger and more intense than historically occurred. Additionally, the increased density and uniformity of these tree stands increases the probability of mortality from disease and predation. Environmental changes resulting from climate change is expected to exacerbate the already observed negative effects of fire suppression (i.e., forest succession, increased fire intensity). Climate change has increased the number, intensity, and extent of wildfires.

Climate Change: As mentioned above, environmental effects resulting from climate change are negatively impacting whitebark pine populations by creating conditions that benefit epidemic levels of the predatory mountain pine beetle and by changing natural wildfire regimes. In addition to current impacts to whitebark pine, predicted rates of climate change could outpace whitebark pine's ability to respond to habitat changes, ultimately resulting in habitat loss.

Inadequate Existing Regulatory Mechanisms: The overwhelming majority of whitebark pine occurs on federally managed lands. All federal agencies to some degree have incorporated whitebark pine conservation policies in their management plans. However, despite positive steps to conserve the species, federal agencies do not have the ability to address the primary threats of white pine blister rust and mountain pine beetle. Management activities to address wildfire vary by forest and at this time the Service does not consider them adequate to address the threat from fire suppression and catastrophic fire rangewide.

What is being done now to conserve whitebark pine?
Currently, there is no known way to stop mortality caused by white pine blister rust and mountain pine beetle, two of the primary threats to the species. However, the Forest Service has, along with university researchers, the National Park Service, and others, made important strides in understanding the white pine blister rust ecology and mountain pine beetle life history. Importantly, research on the propagation of rust-resistant whitebark pine seeds and seedlings is underway and strategic conservation plans are being developed.

What can more information be found?
A copy of the finding and other information about whitebark pine is available online at http://www.fws.gov/mountain-prairie/species/plants/whitebarkpine, or by contacting the Wyoming Ecological Services Field Office, U.S. Fish and Wildlife Service, 5353 Yellowstone Road Suite 308A, Cheyenne, WY 82009, phone (307) 772–2374.