



DISCOVERY

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GRIZZLIES AND WHITEBARK PINE: WHAT'S THE CONNECTION?

Whitebark pine is considered by many biologists to be a keystone species of the subalpine community. Photo: Richard Lake

By **MICHAEL LEACH**
Yellowstone Association

On a blustery late April afternoon along the northwestern flanks of Mount Washburn in Yellowstone National Park, a raggedy-looking female grizzly meanders through a thick stand of whitebark pine in hopes of ending her five-month-long hunger strike. The nine-year-old sow knows this country well, having traveled these slopes and drainages with her mother for the first two years of her life. Now she calls this area home, and with three cubs of the year following at her heels, it is the place she hopes to find the nutritional sustenance her family will need to survive in this wild and rugged landscape.

The previous fall—mid-October to be exact—she began excavating a tightly constructed den, which she lined with dry grasses and boughs from a neighboring Douglas-fir. Upon the first signs of inclement weather, she slowly squeezed her way into her tomb-like home where she would sleep away Yellowstone's harsh winter season. Though many other grizzlies embraced

this first sign of winter and instead chose to continue raiding the middens of red squirrels, our nine-year-old sow had more important business to attend to.

Sometime during the last week of January she awoke just enough to give birth to three rat-sized cubs with no hair, no teeth, and no ability to open their eyes. The female grizzly bear (a member of the Ursidae family) goes through a unique process called delayed implantation. Though this sow's eggs had been fertilized during the mating season (mid-June through mid-July), the zygotes developed just briefly, to the blastocyst stage. Unlike most other mammals, in which the developing eggs attach to the wall of the uterus and continue to grow, this sow's blastocysts floated around the womb in suspended animation, enabling the female bear

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to conserve energy to meet her own needs—rather than the needs of the developing embryos.

It was not until this bear went into hibernation that her body conducted a self-assessment of whether she was in good enough shape to carry the pregnancy to term. The outcome of this assessment was largely dependent upon how nutritionally productive the fall had been for this female.

In the Yellowstone ecosystem, a bear’s fall nutrition and the availability of whitebark pine seeds go hand in hand. In the case of our nine-year-old female, the previous fall’s lucrative whitebark pine crop left her in ideal condition going into hibernation and allowed her to emerge now with three cubs in tow.



Its ability to thrive in the face of the region’s harshest conditions makes the whitebark pine the soldier of Rocky Mountain tree species. Photo: R.G. Johnson

Omnivore generalists, grizzly bears will eat just about anything that allows them to pack on the calories. In Alaska,

the coastal grizzlies have abundant salmon runs that they depend upon,

but Yellowstone doesn’t have the luxury of such fecundity. Like Alaska, however, Yellowstone does offer one staple that is arguably the most important food source for grizzly bears in this ecosystem—the whitebark pine seed.

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The Yellowstone Association, in partnership with the National Park Service, fosters the public’s understanding, appreciation and enjoyment of Yellowstone National Park and its surrounding ecosystem by funding and providing educational products and services.

P.O. Box 117 • Yellowstone National Park, WY 82190
www.YellowstoneAssociation.org • ya@yellowstoneassociation.org
Office: 307-344-2293 • Institute: 307-344-2294
Membership: 307-344-2289 • Sales: 877-967-0090
Monday - Friday • 8 a.m. - 4:30 p.m. Mountain Time



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For everyone who ventures into the subalpine zones of the Rocky Mountains, Cascade, Sierra, and British Columbia coastal ranges, the whitebark pine is a symbol of high-elevation, rugged terrain. Because of its gnarled growth pattern and the difficulty to access it, this long-lived, slow-growing, five-needled pine found throughout the Yellowstone ecosystem at elevations exceeding 8000 feet has relatively little commercial value, but it is considered by many biologists to be a keystone species of the subalpine community.

Its ability to thrive in the face of the region’s harshest conditions makes the whitebark pine the soldier of Rocky Mountain tree species. Growing on cold, dry, windy sites with soils inhospitable to other conifers, the whitebark pine pioneers landscapes where no other tree could possibly survive. In addition to its stunning beauty, the whitebark pine is valued for its watershed protection capabilities. Rooted at elevations where the greatest amount of snowfall occurs, the up-swept branches of the crown, coupled with the whitebark pine’s ability to flourish on Yellowstone’s windiest