



Photo by J. Ball

## Whitebark Pine Cone Production

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## 2009 PROJECT SUMMARY

Whitebark pine (*Pinus albicaulis*) surveys on established transects showed generally good to excellent cone production during 2009 (Figure 1). Twenty-three transects were read. Overall, mean cones/tree was 46.5 (Table 1). All trees on transect R were dead and suitable replacement trees could not be found within the stand. This transect will be retired along with 3 that were retired in 2008 (F1, H, and T; Table 2). The best cone production occurred on new transects established during 2007 (CSA-CAG, Figure 1 and Table 2). Although cones were abundant on most transects, there was a difference (*Student's t* = -4.027, *P* < 0.0001) in production between old (*n* = 129 trees, mean cone/tree = 27.8) and new (*n* = 63 trees, mean cones/tree = 84.8) transects.

Mountain pine beetle (*Dendroctonus ponderosae*) activity continues at high levels on our original 19 transects. We observed additional mortality among trees originally surveyed since 2002. Total mortality on transect trees read since 2002 is 69.5% (132/190) and 94.7% (18/19) of transects contain beetle-killed trees. Five (71.4%) of the 7 new transects exhibited beetle activity.

State and federal management agencies should inform the public that whitebark pine cone production was good in most locales surveyed and grizzly bears (*Ursus arctos*) will likely be searching for this key fall food in the higher elevations above 8,000 ft. However, extensive areas of beetle-killed whitebark pine may reduce cone abundance and availability locally. Historically, numbers of grizzly bear-human conflicts and management actions tend to decrease during years

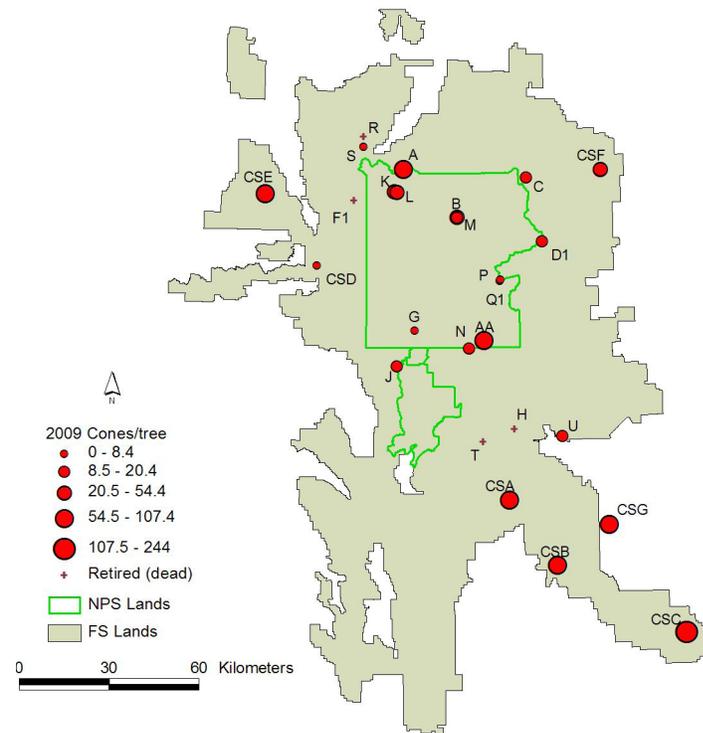


Figure 1. Location and mean cones/tree for 26 whitebark pine (*Pinus albicaulis*) cone production transects surveyed in the Greater Yellowstone Ecosystem during 2009.

with good cone production but the current whitebark pine mortality evident in many areas may dampen or modify this trend. Recreationists and those who live in bear country should be aware of this and take appropriate measures to avoid encounters with grizzly bears. As always, food security and clean camps in the front and backcountry should be emphasized.

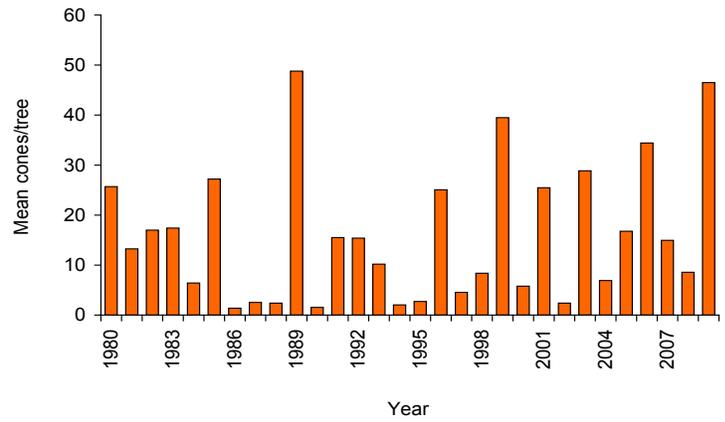
Numbers of reported conflicts have been relatively low through mid-August. Hopefully this trend will

Table 1. Summary statistics for whitebark pine (*Pinus albicaulis*) cone production transects surveyed during 2009 in the Greater Yellowstone Ecosystem.

Total			Trees				Transect			
Cones	Trees	Transects	Mean cones	SD	Min	Max	Mean cones	SD	Min	Max
8,928	192	22	46.5	81.7	0	630	405.8	485.2	16	2,193

**Table 2. Whitebark pine (*Pinus albicaulis*) cone production transect results for 2009.**

Transect	Cones	Trees	Mean	SD
A	704	10	70.4	196.9
B	486	10	48.6	22.5
C	176	9	19.6	11.5
D1	58	5	11.6	7.3
F1	Dead (retired)			
G	53	10	5.3	5.7
H	Dead (retired)			
J	198	10	19.8	22.3
K	403	10	40.3	31.0
L	385	10	38.5	32.4
M	203	10	20.3	15.4
N	112	10	11.2	15.0
P	34	10	3.4	3.1
Q1	30	10	3.0	6.1
R	Dead (retired)			
S	25	3	8.3	3.8
T	Dead (retired)			
U	21	2	10.5	12.0
AA	699	10	69.9	43.0
CSA	964	9	107.1	79.5
CSB	723	10	72.3	67.4
CSC	2,193	9	243.7	164.9
CSD	16	10	1.6	2.7
CSE	274	5	54.8	56.7
CSF	345	10	34.5	24.8
CSG	826	10	82.6	35.9



**Figure 2. Annual mean cones/tree on whitebark pine (*Pinus albicaulis*) cone production transects surveyed in the Greater Yellowstone Ecosystem during 1980–2009.**

continue throughout the fall. Interagency Grizzly Bear Study Team research clearly shows that bears tend to eat more meat when whitebark pine seeds are not available and that there is an increase in hunter-grizzly bear conflicts and mortalities in poor seed years. Hunters should be extra cautious this year when hunting in areas where whitebark pine mortality is extensive. Hunters should be encouraged to carry and use pepper spray when possible as studies have shown it is effective in self-defense situations.

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