

# Interagency Grizzly Bear Study Team

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## Whitebark Pine Cone Production

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## 2010 PROJECT SUMMARY

Whitebark pine (*Pinus albicaulis*) surveys on established transects indicated generally poor cone production during 2010 (Figure 1). Twenty-two transects were read. Overall, mean cones/tree was 5.25 (Table 1). All trees on transect S were dead and suitable replacement trees could not be found within the stand. This transect will be retired along with 4 that were retired in 2008 and 2009 (F1, H, R, and T; Table 2). While cone production on most transects was poor, better cone production (8.49 versus 3.57 mean cones/tree, *Student's t* = -3.369, *P* < 0.001) occurred on transects established during 2007 (CSA–CAG, Figure 1 and Table 2) that tend to be located on the periphery of the Greater Yellowstone Ecosystem outside the Recovery Zone.

We observed additional mountain pine beetle (*Dendroctonus ponderosae*) caused tree mortality among individual trees surveyed since 2002. Total mortality on these trees is 72.6% (138/190) 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 cones are generally scarce in most locales and grizzly bears will be searching for other foods this fall. Recreationists and those who live in bear country should be aware of this and take appropriate measures to avoid encounters with grizzly bears. Interagency Grizzly Bear Study Team research clearly shows that bears

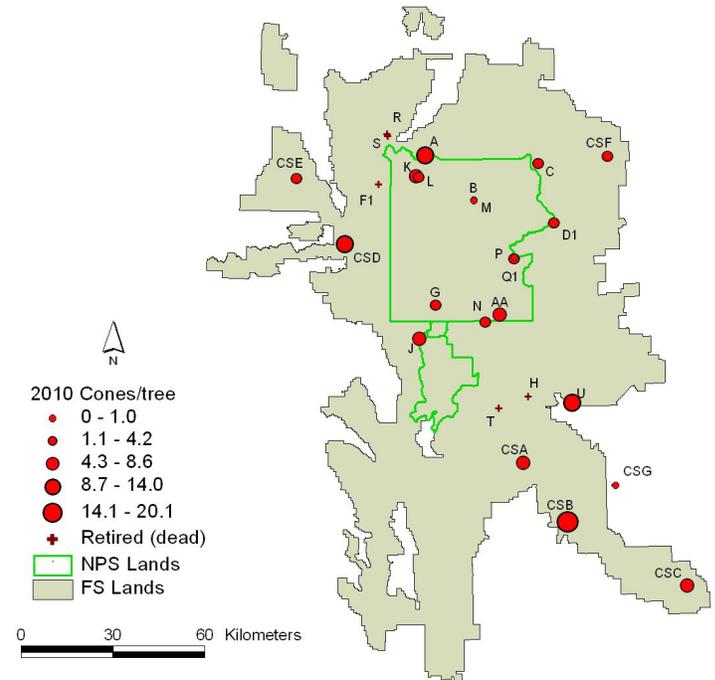


Figure 1. Locations and mean cones/tree for 22 whitebark pine (*Pinus albicaulis*) cone production transects surveyed in the Greater Yellowstone Ecosystem during 2010.

tend to eat more meat when whitebark pine seeds are not available and that there is an increase in hunter-grizzly bear conflicts and bear mortalities in poor seed years. Extensive areas of beetle-killed whitebark pine may exacerbate this trend. Hunters should be extra cautious this year and should be encouraged to carry and use bear spray when possible as studies have shown it is effective in self-defense situations. As always, food security and clean camps in the front and backcountry should be emphasized.

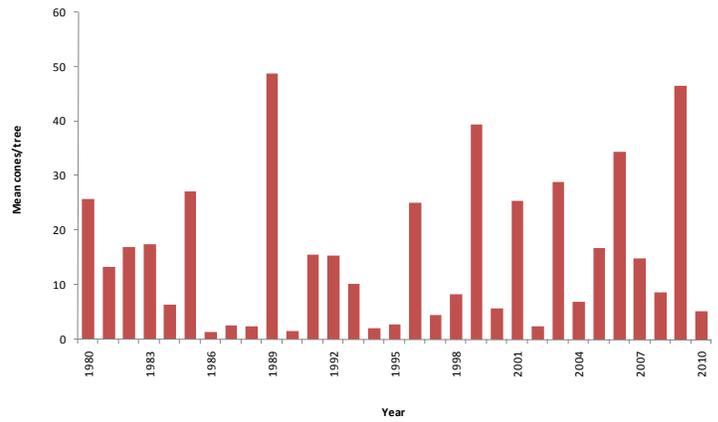
Table 1. Summary statistics for whitebark pine (*Pinus albicaulis*) cone production transects surveyed during 2010 in the Greater Yellowstone Ecosystem.

Total			Trees				Transect			
Cones	Trees	Transects	Mean cones	SD	Min	Max	Mean cones	SD	Min	Max
971	185	22	5.2	9.7	0	65	46.2	48.3	0	201

**Table 2. Whitebark pine (*Pinus albicaulis*) cone production transect results for 2010.**

Transect	Cones	Trees	Mean	SD
A	101	9	11.22	21.6
B	10	10	1.00	1.4
C	32	9	3.56	2.9
D1	21	5	4.20	4.1
F1	Retired in 2008			
G	19	10	1.90	2.2
H	Retired in 2008			
J	52	8	6.50	5.6
K	55	10	5.50	6.6
L	29	10	2.90	1.9
M	9	10	0.90	0.9
N	26	10	2.60	2.5
P	18	10	1.80	3.5
Q1	0	10	0.00	0.0
R	Retired in 2009			
S	Retired in 2010			
T	Retired in 2008			
U	14	1	14.00	
AA	50	10	5.00	3.3
CSA	75	10	7.50	9.0
CSB	201	10	20.10	17.0
CSC	86	10	8.60	13.0
CSD	129	10	12.90	16.8
CSE	7	3	2.33	2.1
CSF	36	10	3.60	5.0
CSG	1	10	0.10	0.3

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**Figure 2. Annual mean cones/tree on whitebark pine (*Pinus albicaulis*) cone production transects surveyed in the Greater Yellowstone Ecosystem during 1980–2010.**



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