

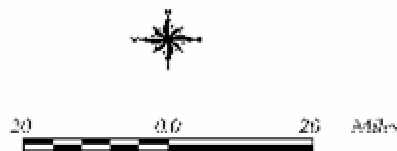
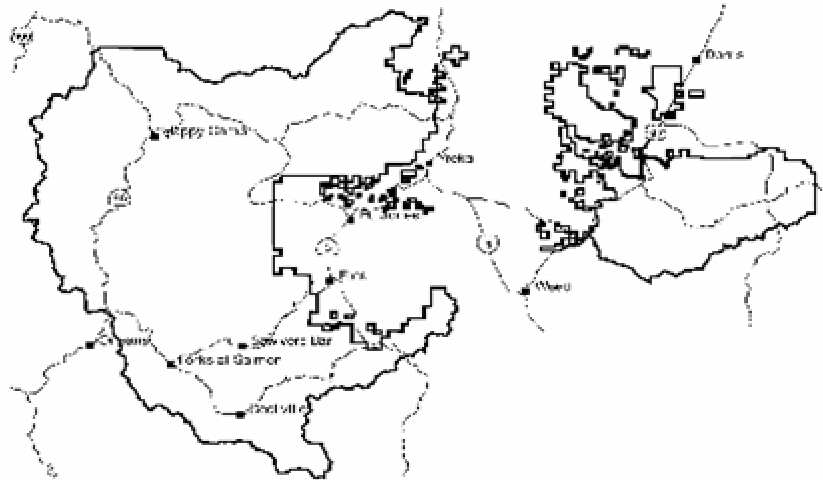


Successful Non-chemical Management of Spotted Knapweed through Partnership

**Marla Knight, Klamath National Forest
Steve Orloff, UC Cooperative Extension**



Klamath National Forest



NO SCALE


September 18, 2006

Figure 1

In
EXTREME
Northern
California,
Siskiyou
County

Project background:

- Discovered in 1997, while recreating at my favorite swimming hole...
- Naively thought it was one spot...
- Hand digging was started, and once we had an “eye” for it, noticed it on every river bar.
- Panic ensued. We got serious with inventory, and enlisted the help of the Salmon River Restoration Council.



During the next two years, over 200 sites were found, on 150 acres, along 28 miles of river, and steep, rocky terrain.

We decided to initiate an Environmental Assessment that included the use of chemicals.

That's when the &!*#
hit the fan!

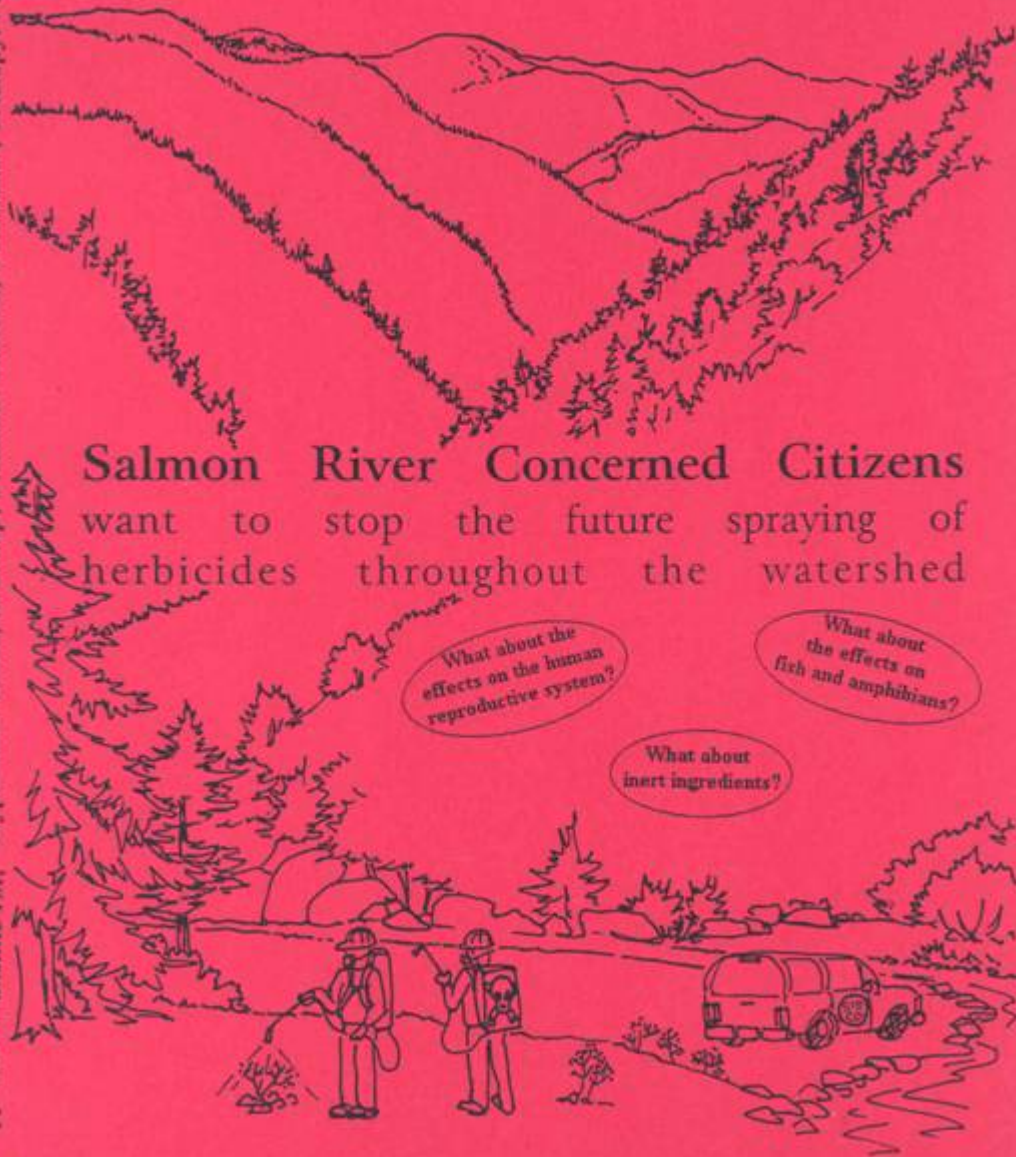
Chemicals are a very controversial subject on the Salmon River!!!



And the artists responded!!

Support a pesticide free watershed

Clpyralid / Transline TM; Glyphosate / Rodeo, Roundup; Dicamba / Banvel K, Weedmaster; Triclopyr / Garlon...



Salmon River Concerned Citizens
want to stop the future spraying of
herbicides throughout the watershed

-B-Gon, Super weedone, Tordon 212, Weedmaster, Weedone LF4; Picloram / Tordon 22K, Tordon 10K, Tordon 2K, Tordon

Lots of anti-chemical and anti-Forest Service flyers began to appear...

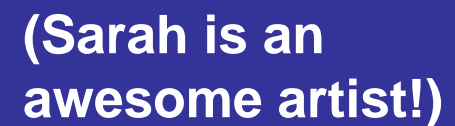
We had some heated meetings and encounters, and then....



Chemical Name / Trade Name: 2,4-D / Banvel K, Dow Formula 40, Knoxweed 10-4G, Ortho Weed

A photograph of a river flowing through a rocky, brushy landscape. The river is in the background, with water flowing over rocks. The foreground is filled with dry, brown brush and small green plants growing in a rocky, sandy area. The text is overlaid on the image.

...the Salmon River
Community bonded together
and offered their own
alternative:
non-chemical methods
including hand digging and
mulching.



We continued with non-chemical treatment methods while conducting the analysis.





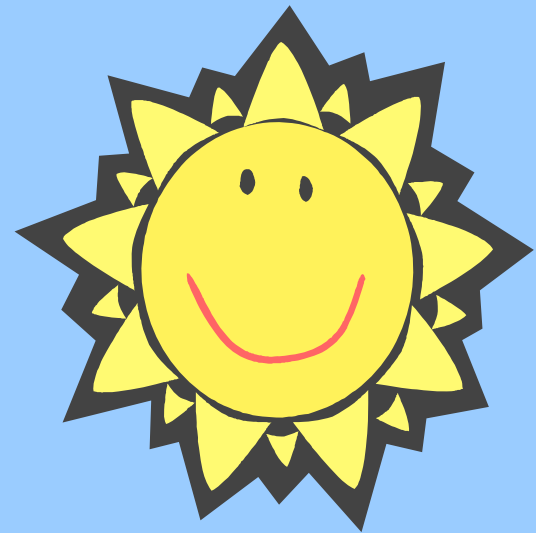
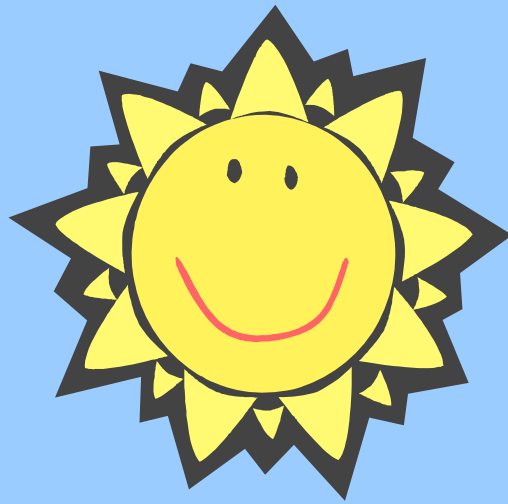
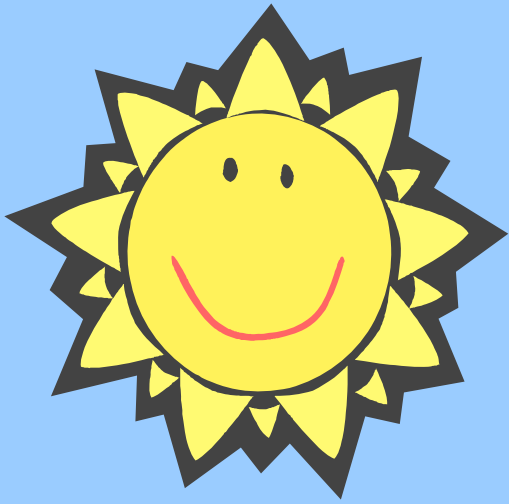
Rolling out the
plastic mulch,
1999.

Any stem poking up through the plastic would sprout from as little as one inch of stem....



A photograph of a natural landscape. In the foreground, there is a field of dry, yellowish-brown grass with some green patches. A dirt path or clearing runs through the lower part of the field. In the middle ground, there are several large, dense green bushes and a few smaller trees. The background features a steep, light-colored, rocky hillside that appears to be a scree or talus slope. The hillside is partially covered with small, young green trees. The overall scene is brightly lit, suggesting a sunny day.

The site in 2002,
post mulch, all
native plants!



Finally, in November of 2000, the Klamath National Forest Supervisor made a precedent-setting decision:

Chemicals will NOT be used as long as the non-chemical methods employed by the Salmon River community meet certain criteria, and continue to show progress toward eradication.

The Criteria

- 1. Established evaluation sites must show an average decrease of greater than or equal to 60% as measured by density and frequency of plants from the previous year.**
- 2. All reasonable efforts to prevent flowering and seed set will be expended. An average of no more than one plant with viable seed per site, at any site, will be allowed at the end of the season.**
- 3. Known sites will not increase in area.**



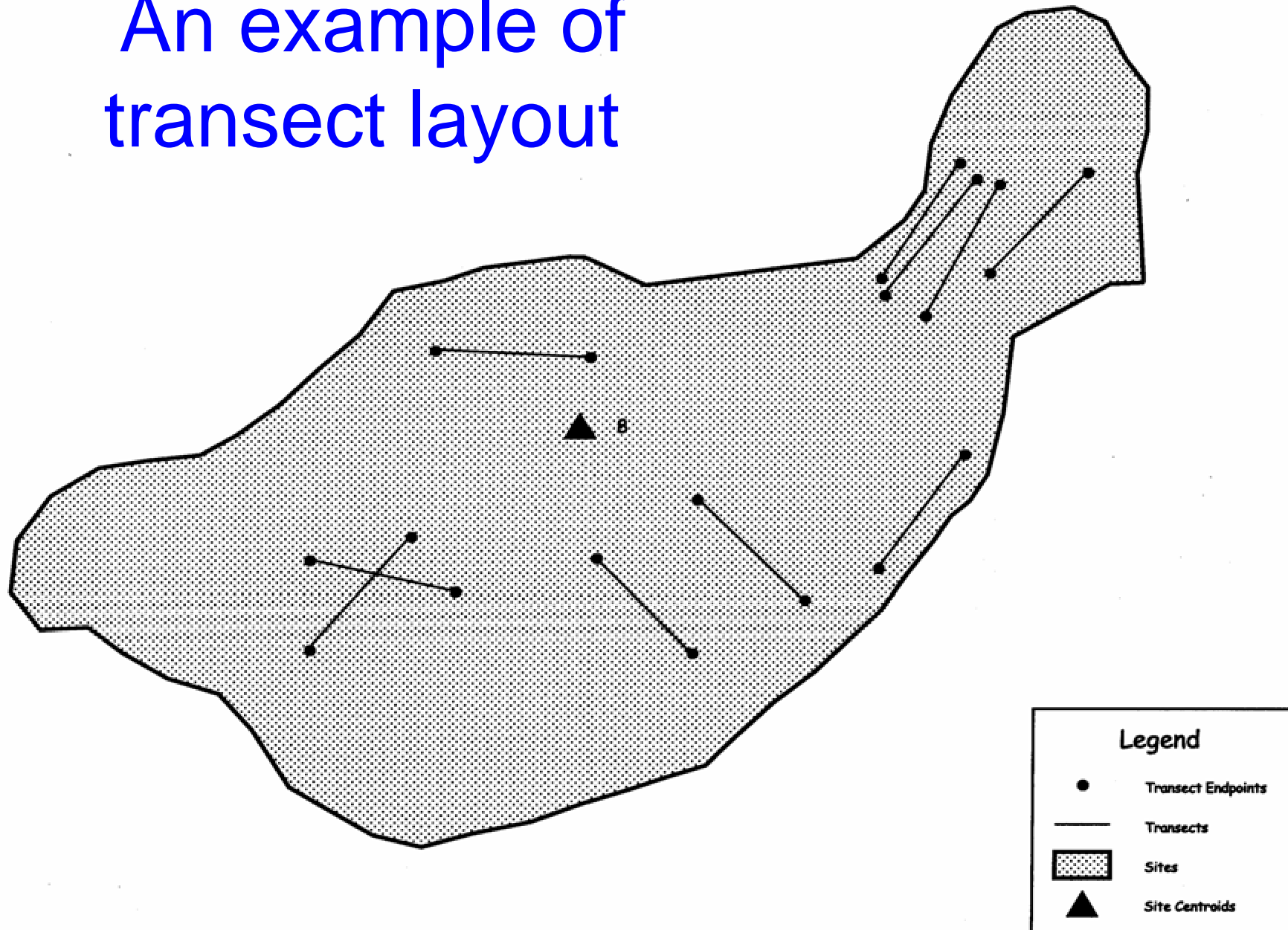
We started coming together
to meet the objective of
getting rid of knapweed



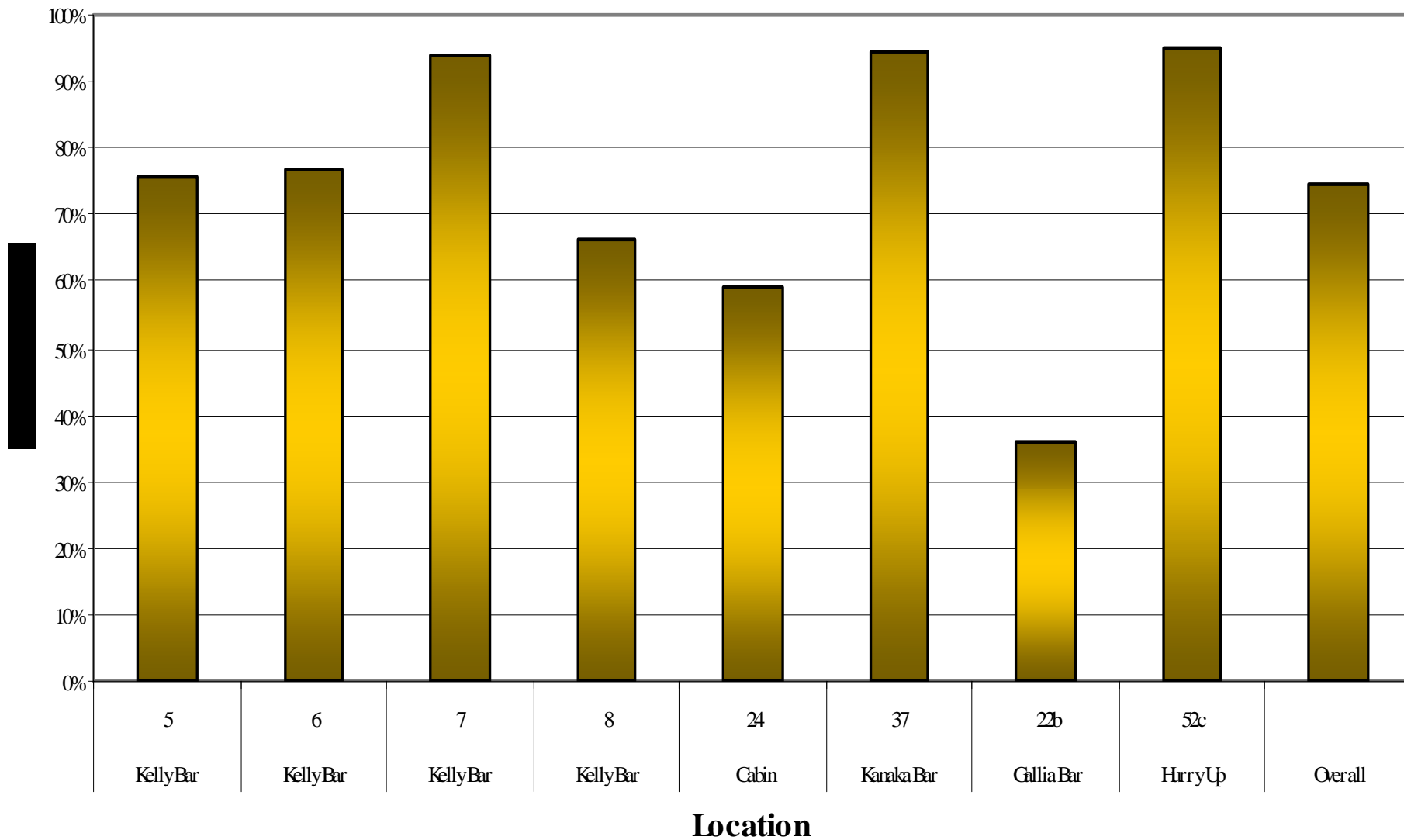
We needed a monitoring plan...

- Select sites with dense infestations
- Measure density by random hoop tosses
- Measure frequency by hits along a set transect
- Evaluation performed by an impartial third party
- Continue it for five years.

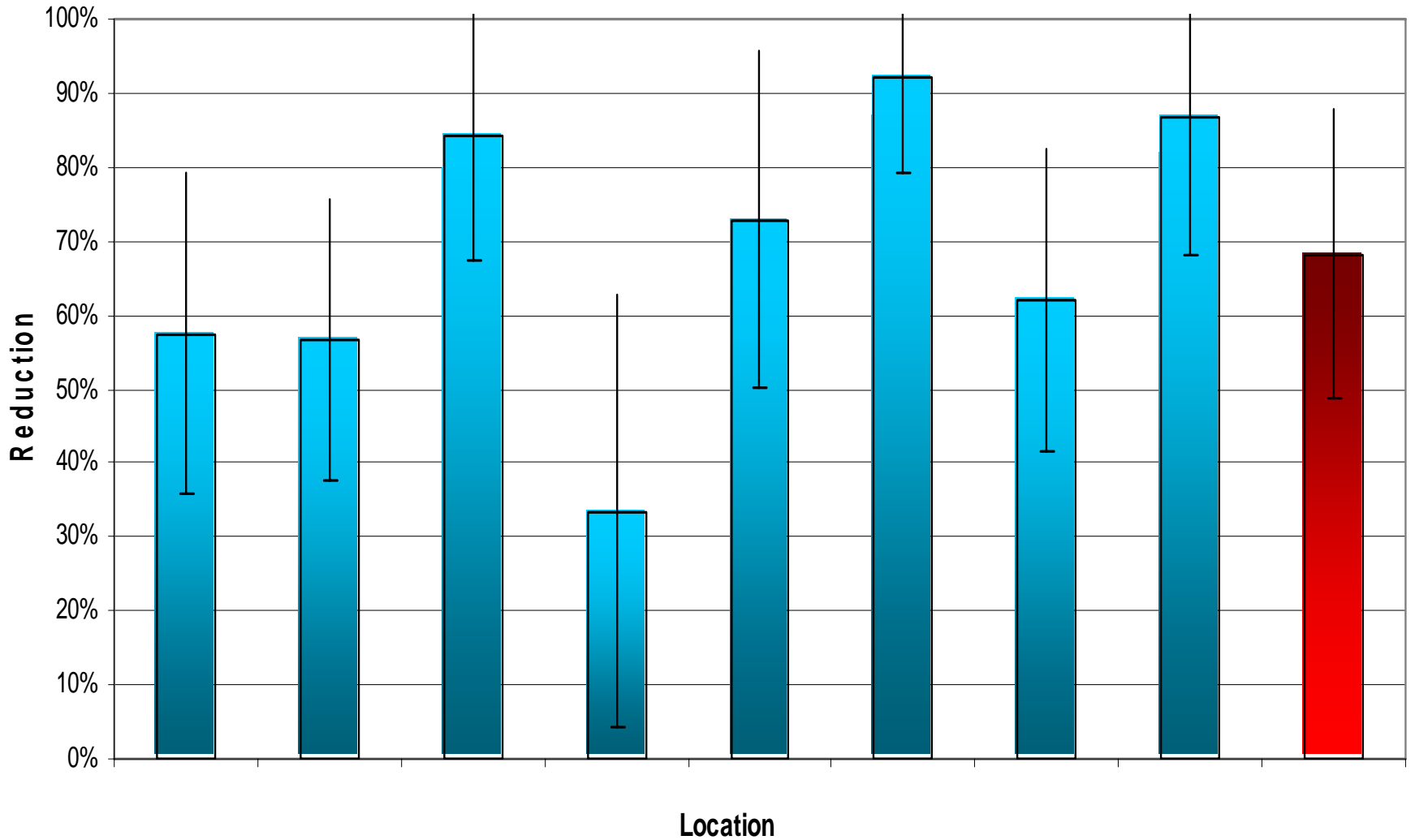
An example of transect layout



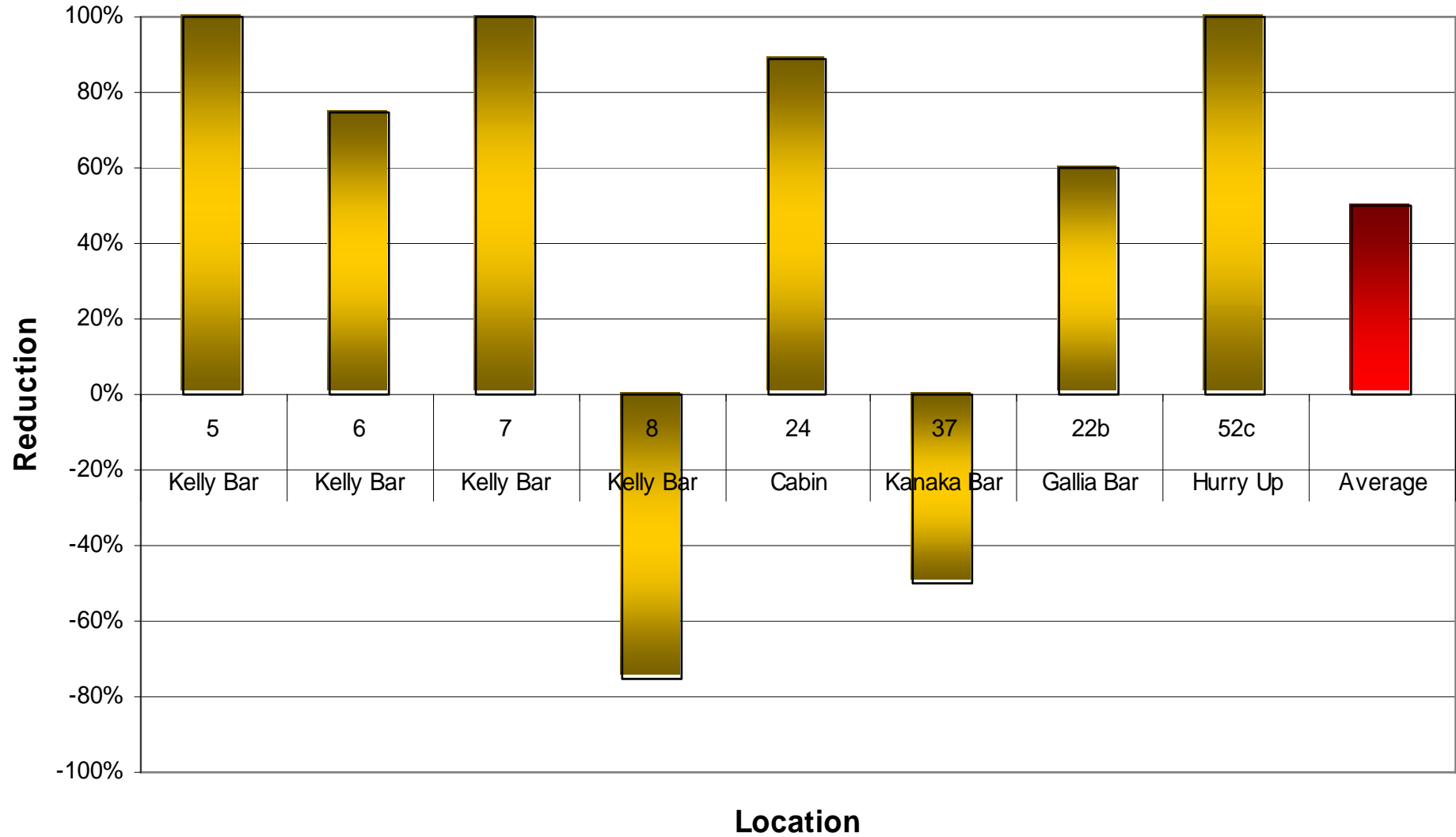
Reduction in Spotted Knapweed Density (2000 to 2001)



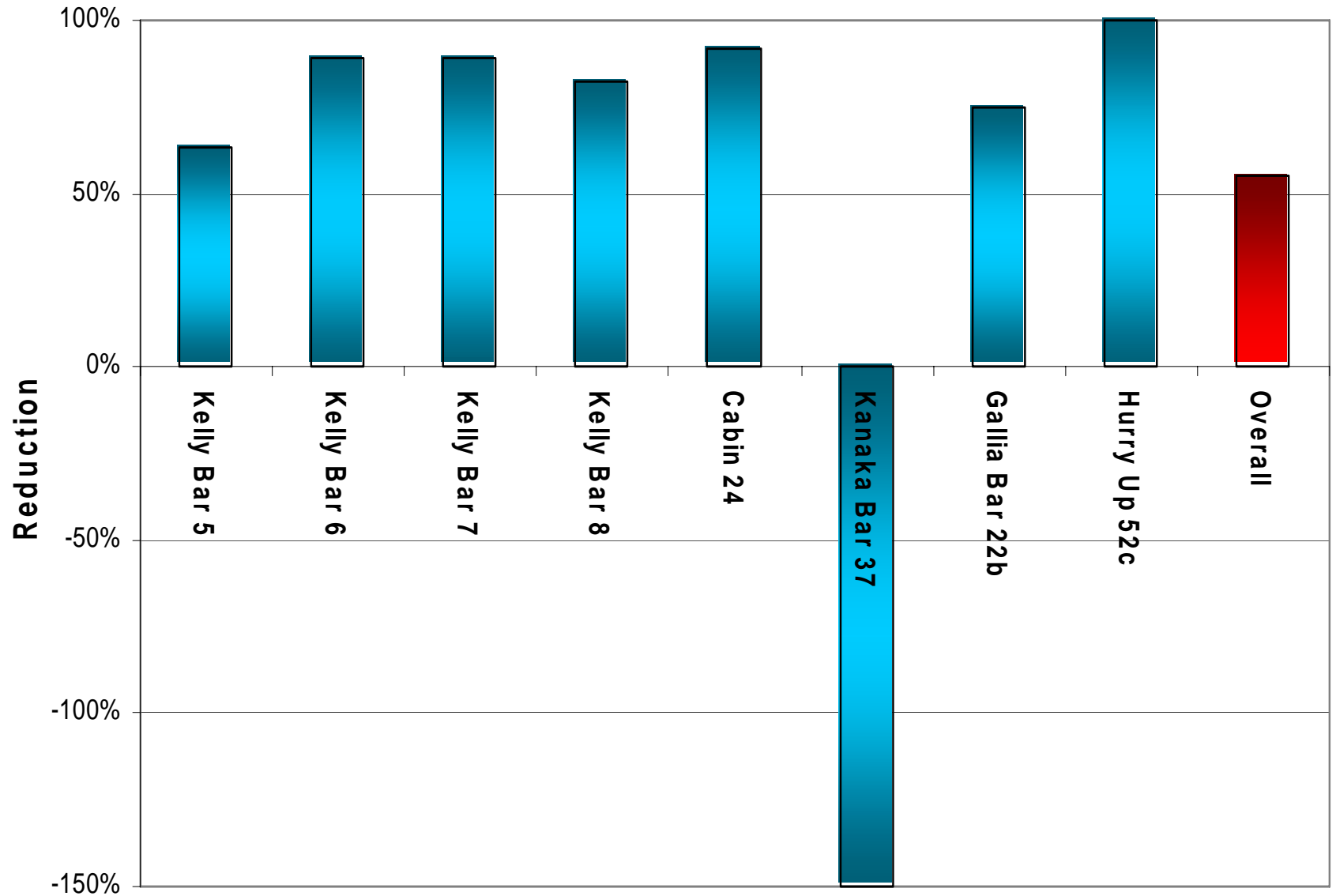
Reduction in Spotted Knapweed Occurrence Along Transects 2000-2001




Reduction in Spotted Knapweed Density (2002 to 2003)



Reduction in Spotted Knapweed Occurrence Along Tansects (2002 to 2003)



A photograph of a mountain landscape. In the foreground, there is a rocky, light-brown slope. The middle ground shows a deep valley filled with dense, dark green forest. In the background, a large mountain peak is visible, with patches of snow or light-colored rock on its upper slopes. The sky is a clear, bright blue.

**Just in case you thought Salmon
River was flat...**

**...this site from across
the drainage looks like...**



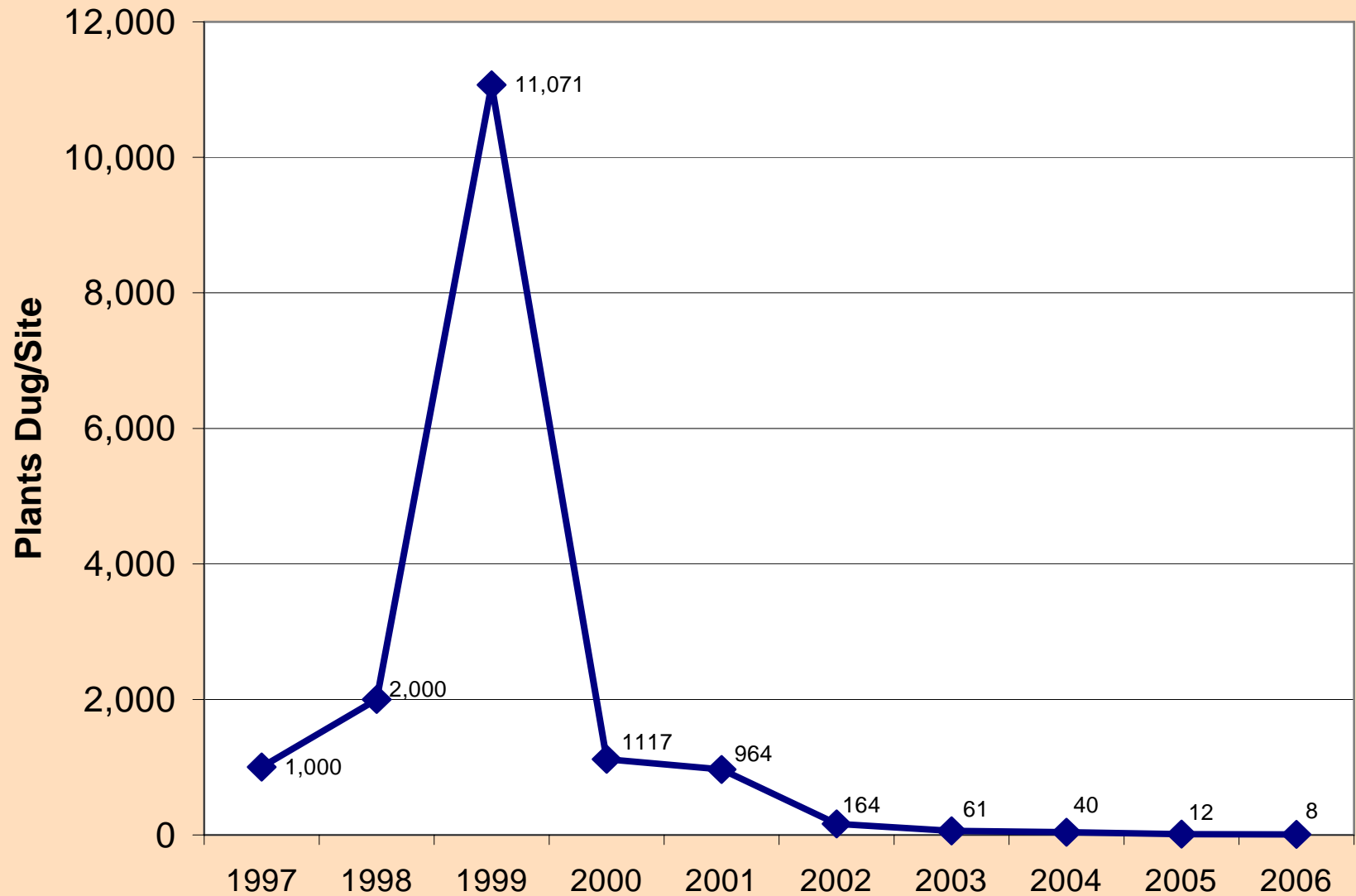
Total Counts per Site After Altering Sampling Protocol

Year	Site 5	Site 6	Site 7	Site 8	Site 22.2	Site 24	Site 37	Site 52.3
2003	17	9	25	N/A	N/A	31	5	12
2004	35	3	0	146	276	21	9	5
2005	5	2	20	93	173	2	13	30
2006	3	3	17	44	60	11	0	0

Acres **0.6** **0.5** **0.5** **2.1** **8.3** **4** **3.4** **0.2**

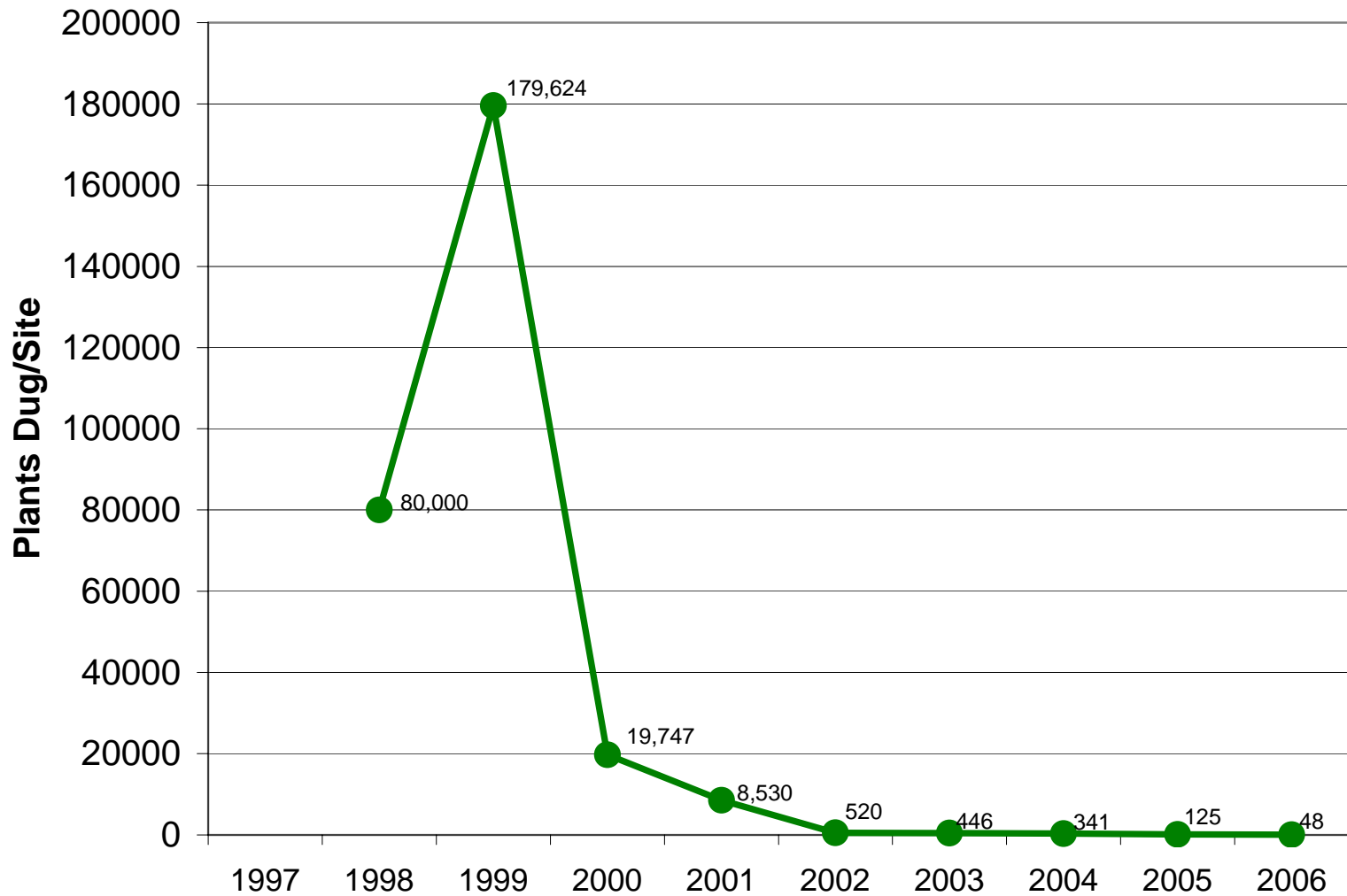
Spotted Knapweed Population

Site 5



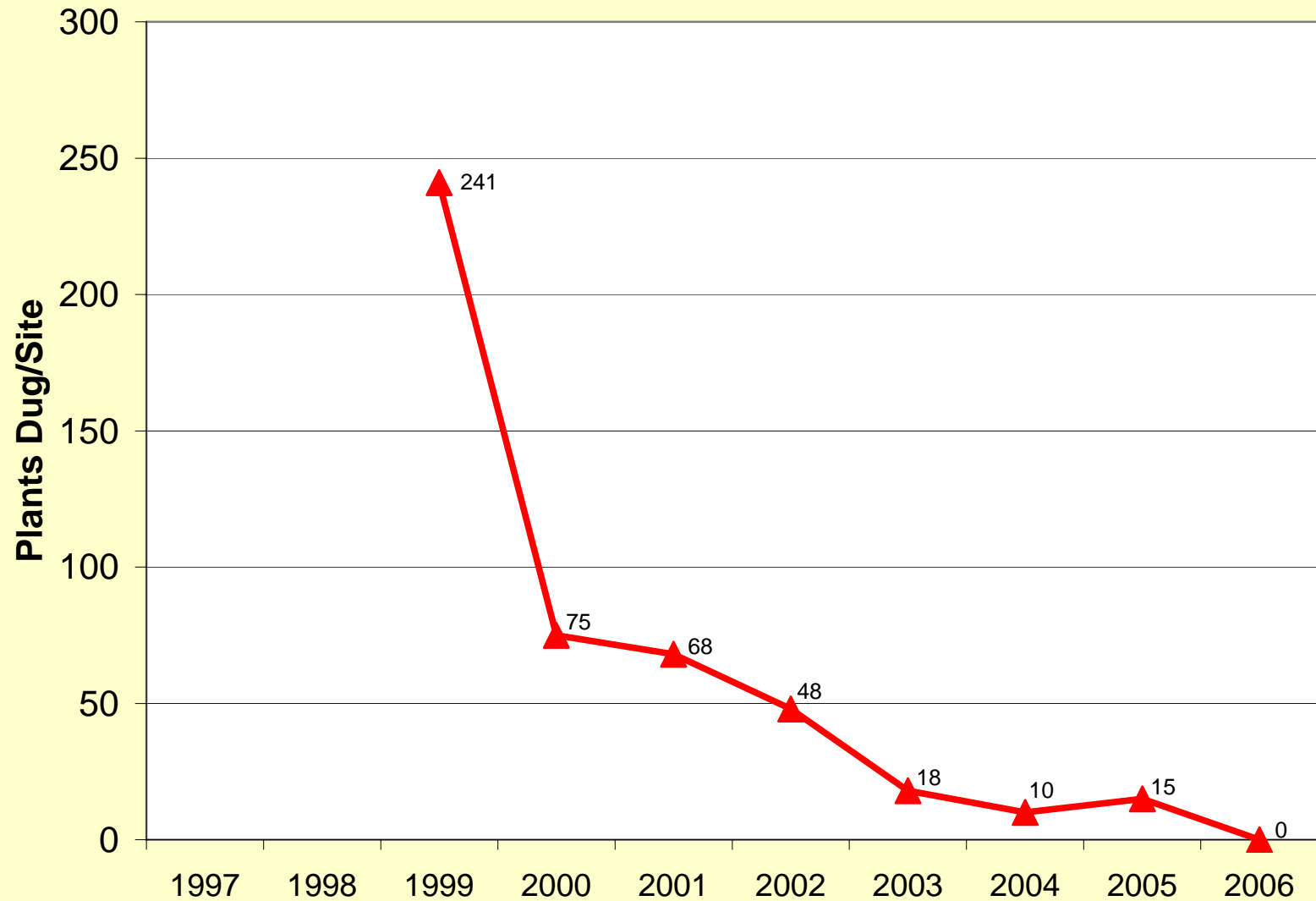
Spotted Knapweed Population

Site 8



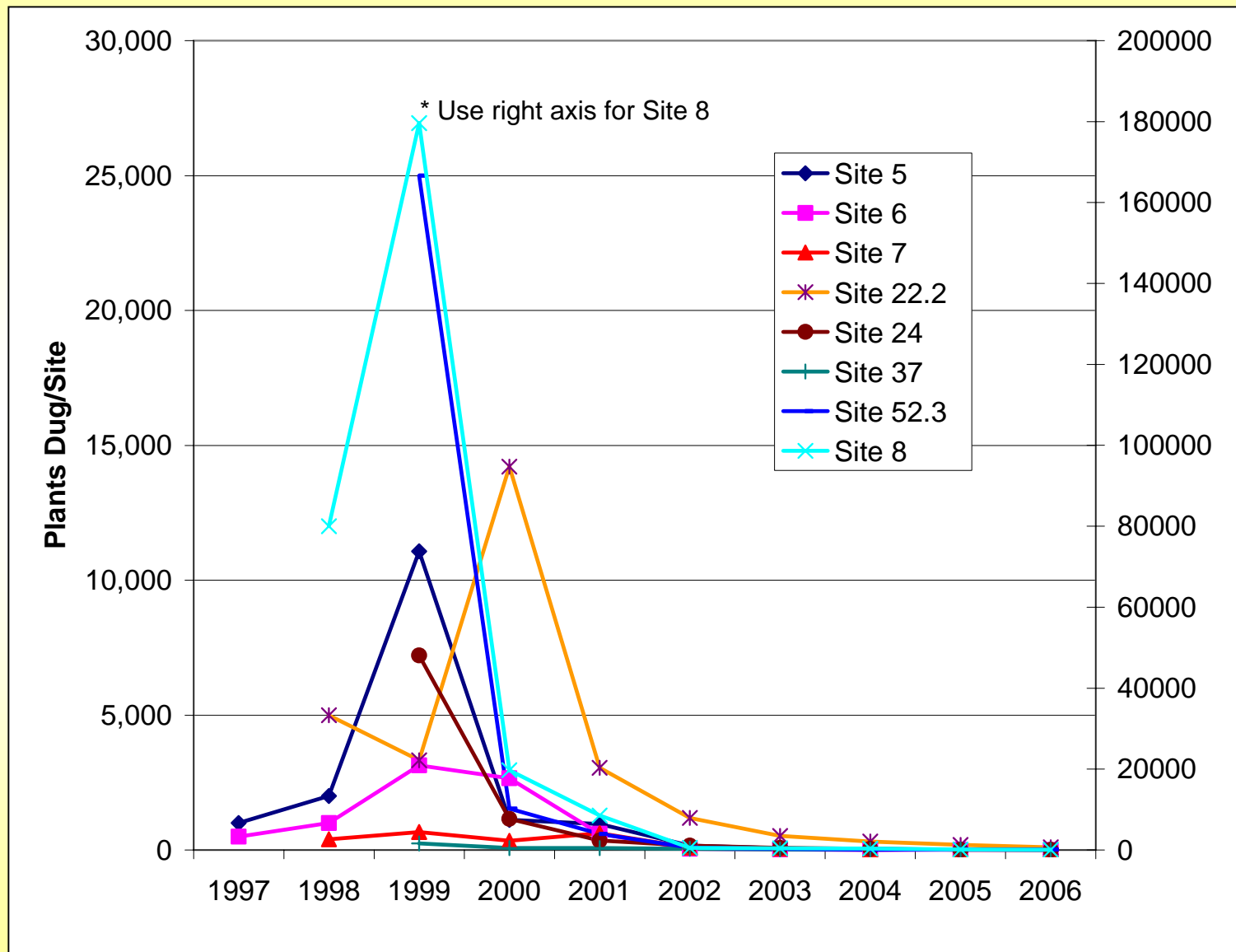
Spotted Knapweed Population

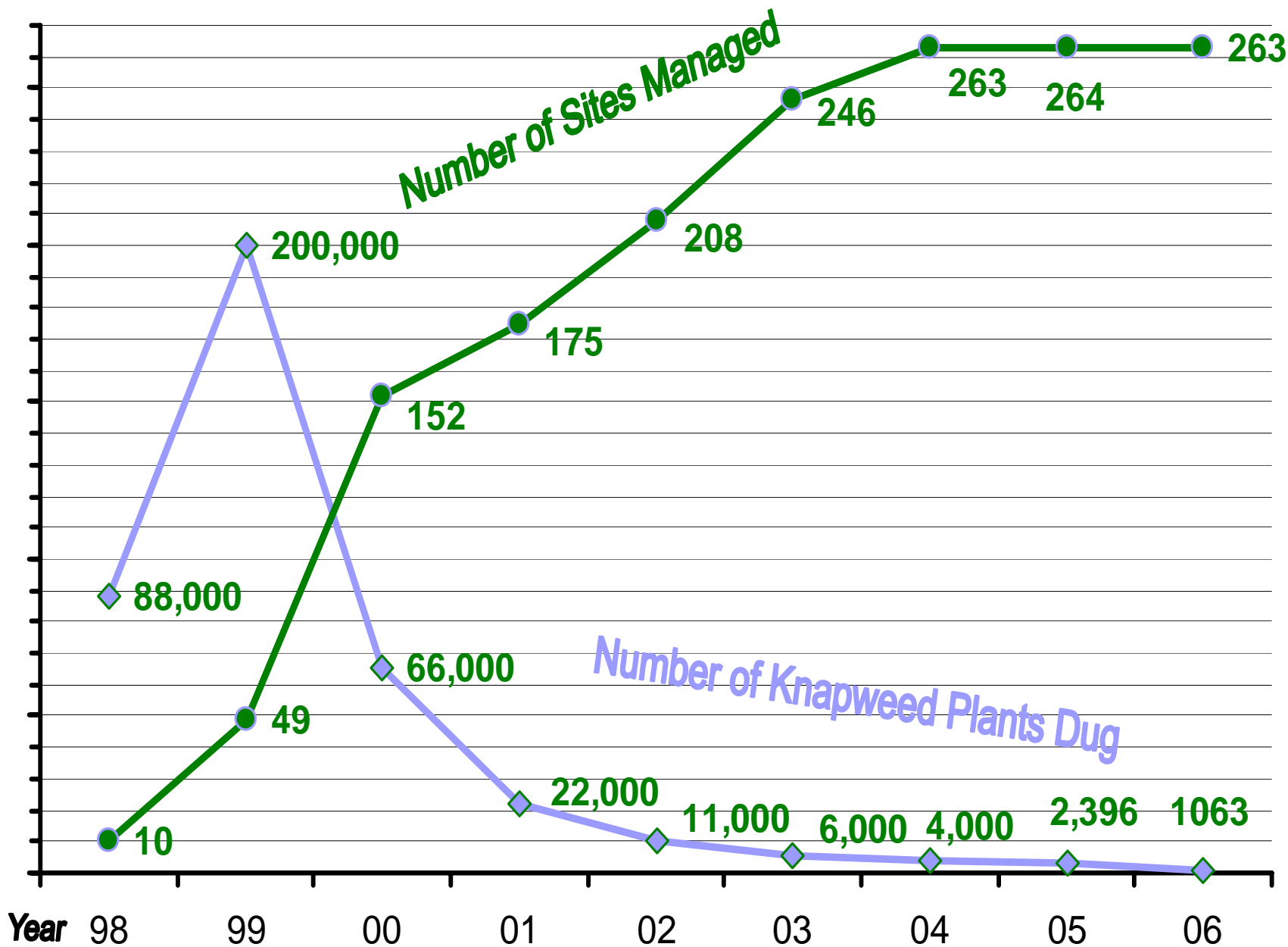
Site 37



Spotted Knapweed Population

All Sites





The Bottom Line

- Total Hours of volunteer labor: 19,558
- Total \$ Expended: \$313,549.00
- Cost/acre (treatment ac.): \$20,903.00
- Cost/acre (gross ac.): \$2090.00

Conclusion

- This has been a very successful program
 - A highly volatile issue was resolved.
 - The local community and agencies came together to solve a problem, which has resulted in increased education and awareness by everyone.
 - Density of knapweed has decreased substantially on all sites, some to zero.
 - However, very high cost (maybe higher than land prices) so may not be feasible practice in other areas.
 - The NEPA Decision, and the monitoring method was flexible, allowing for changing conditions as populations decline.



In Memory of
Tom Holzem,
a dedicated
knapweed
activist, may
he rest on his
knapweed-
free laurels!

This plant defies the literature, 7'
tall!

THANK YOU

- To the Salmon River Restoration Council and Community Members for their years of dedicated service to ecosystem health! (and some great pictures)...
- To the Funders: California Dept. of Fish and Game, Rocky Mtn. Elk Foundation, National Fish and Wildlife Foundation, U.S. Forest Service, Siskiyou County Resource Advisory Council