Successful Non-chemical Management of Spotted Knapweed through Partnership

Marla Knight, Klamath National Forest
Steve Orloff, UC Cooperative Extension
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!!
Lots of anti-chemical and anti-Forest Service flyers began to appear...

We had some heated meetings and encounters, and then....
...the Salmon River Community bonded together and offered their own alternative: **non-chemical methods including hand digging and mulching.**
These types of flyers were created and distributed throughout the Salmon River Communities.

(Sarah is an awesome artist!)
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....
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 Occurrence Along Transects
2000-2001

Location
Reduction
Reduction in Spotted Knapweed Density (2002 to 2003)

Location

5 6 7 8 24 37 22b 52c
Kelly Bar  Kelly Bar  Kelly Bar  Kelly Bar  Cabin  Kanaka Bar  Gallia Bar  Hurry Up

Reduction

-100% -80% -60% -40% -20% 0% 20% 40% 60% 80% 100%
Reduction in Spotted Knapweed Occurrence Along Transects (2002 to 2003)

-150%  -100%  -50%  0%  50%  100%

Kelly Bar 5  Kelly Bar 6  Kelly Bar 7  Kelly Bar 8  Cabin 24  Kanaka Bar 37  Gallia Bar 22b  Hurry Up 52c  Overall

Overall Reduction
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

<table>
<thead>
<tr>
<th>Year</th>
<th>Site 5</th>
<th>Site 6</th>
<th>Site 7</th>
<th>Site 8</th>
<th>Site 22.2</th>
<th>Site 24</th>
<th>Site 37</th>
<th>Site 52.3</th>
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<tbody>
<tr>
<td>2003</td>
<td>17</td>
<td>9</td>
<td>25</td>
<td>N/A</td>
<td>N/A</td>
<td>31</td>
<td>5</td>
<td>12</td>
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<tr>
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<td>3</td>
<td>0</td>
<td>146</td>
<td>276</td>
<td>21</td>
<td>9</td>
<td>5</td>
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<tr>
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<td>5</td>
<td>2</td>
<td>20</td>
<td>93</td>
<td>173</td>
<td>2</td>
<td>13</td>
<td>30</td>
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<tr>
<td>2006</td>
<td>3</td>
<td>3</td>
<td>17</td>
<td>44</td>
<td>60</td>
<td>11</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

| Acres | 0.6 | 0.5 | 0.5 | 2.1 | 8.3 | 4   | 3.4  | 0.2 |
Spotted Knapweed Population

All Sites

* Use right axis for Site 8
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