For many years the Tongass National Forest (TNF) used reed canarygrass (RCG) to stabilize disturbed soil following road construction and development. The use of RCG in seed mixes was abandoned when its invasive nature became apparent, but not before hundreds of miles of roads were infested. Reed canarygrass poses a significant threat to the health of Alaska ecosystems, particularly riparian zones and wetlands, where it may negatively affect fish and wildlife. Nevertheless, few RCG control projects have been undertaken in the TNF, whether due to the scale of the infestation, the lack of NEPA compliance for herbicide use, or limited resources available for invasive plant control. Consequently, RCG persists and continues to expand from seeded areas and contaminated rock pits into a range of important, uninfested habitat.

In 2013, the Wrangell Ranger District completed an invasive plant management plan that included the use of select herbicides. We discuss the results of our initial implementation work that focused on treatments of active USFS rock pits and select roads and infestations in the Stikine-Leconte Wilderness. Our main observations are as follow: (1) While no longer deliberately seeded, RCG infestations are continuing to spread, even into pristine areas. (2) RCG often becomes established in riparian areas downstream of infested roadsides, where it is difficult to control. (3) The use of contaminated aggregate from infested rock pits appears to be an important mechanism of spread whereas the role of seed in infestation spread is unclear. (4) Tarping projects in the Stikine-Leconte Wilderness have had limited success and have failed to keep infestations under control. (5) Two successive years of glyphosate applications significantly reduced RCG infestations. In the future we hope to strengthen the implementation of rock pit best management practices and to develop a strategy for more heavily infested areas where there are still opportunities to safeguard uninfested riparian areas and wetlands.
Reed Canarygrass

Control or Give up?

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In the early 1900’s nonnative agronomically important genotypes of reed canarygrass (RCG; *Phalaris arundinacea*) were introduced to North America. Tongass National Forest used RCG hybrids in a soil stabilization seed mix. The TNF no longer seeds RCG, infestations are persistent and widely distributed across the road network. RCG is continues to expand along roads and into natural habitats. Local mechanical efforts (tarping) on the Stikine River have largely not been successful due to difficulty in keeping tarps in place in frequently flooding conditions. 2013 Completed Programmatic NEPA compliance to incl. select herbicides 2014 Acquired necessary tools and permits 2015-2016 hired one seasonal and implemented treatment work
Implementation Priority:

• Spread of RCG in the Stikine-LeConte Wilderness is our greatest concern.
• It is established 30 miles upstream and is expanding downriver
• Nevertheless, in 2014 and 2015 we began implementation in a less sensitive area on **Etolin Island** to build local capacity as well as USFS and community support for the use of herbicides within the Wilderness.
• Work on RCG in the Stikine River was initiated in 2016
Project Area:  Etolin Island Transportation System
Formulation

- Aquatic formulation of glyphosate at **72 Oz/Acre**
  (labeled rate (Aquamaster®) = 48 - 74 Oz/acre)
- Surfactant: Agridex® $\frac{1}{2}$ - 1 Oz/Gal
- Indicator dye

Application Type/Equipment:

- Foliar Spot Spray only to terrestrial habitats
- Backpack sprayers (50 Gallons Per Acre)
- ATV sprayer (75 Gallons Per Acre)

Timing: post-flower application (mid-July – end Sept)

Weather: Dry, dew-free weather

Crew: 3

work days ~ 24 work days, and many more rain-out days!
RESULTS (field conditions)

- Completely treated >80 miles of ATV-drivable road and rock pits in 2016
- Treated ~8 canopy acres (BV) in 2015 and again in 2016.
- Collected effectiveness data for 1.5 canopy acres after the first treatment BV of the retreatment

<table>
<thead>
<tr>
<th>2015</th>
<th>2016</th>
<th>Canopy area reduced to</th>
</tr>
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<tbody>
<tr>
<td>0.12 ac</td>
<td>0.04 ac</td>
<td>33 %</td>
</tr>
<tr>
<td>0.50 ac</td>
<td>0.14 ac</td>
<td>28 %</td>
</tr>
<tr>
<td>0.20 ac</td>
<td>0.04 ac</td>
<td>20 %</td>
</tr>
<tr>
<td>0.21 ac</td>
<td>0.12 ac</td>
<td>57 %</td>
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<tr>
<td>0.46 ac</td>
<td>0.29 ac</td>
<td>64 %</td>
</tr>
<tr>
<td>0.12 ac</td>
<td>0.025 ac</td>
<td>21 %</td>
</tr>
<tr>
<td>0.03 ac</td>
<td>0.005 ac</td>
<td>17 %</td>
</tr>
</tbody>
</table>
Treatment Effectiveness

Main factors affecting control %:
• 1 overlooked plants
• 2 plants/propagules with little/no foliage
• 3 deliberately untreated
• 4 other application issues?
Effectiveness Factors: Overlooked Plants

Plants overlooked in YEAR 1: (photo 1 month after application)
Effectiveness Factors: Obscured by dense thatch

• PLANTS overlooked in year 2: Thick thatch may obscure regrowth the subsequent year: this will result substantial retreatment needed in the third year and push out control to year 4.
Effectiveness Factors: Reduced/No foliage

**Disturbance:**
- Plants in road matrix that are damaged by driving
- Culvert and Ditch cleaning projects
- Plants that have been grazed
- Rhizomes/nodules in the soil, not connected to leaves
Effectiveness Factors: Outside NEPA compliance:

- Can spray up to waterline but not in water
Effectiveness Factors: Ingrowth from Seed

- Infestation expansion from apparent seed germination flush
- Seed germinated plants take 2 years to mature hence may not be recognized as RCG in the year of germination
- Pushes out control at least one more year in this location even if no further seed flushed occur in future
Effectiveness Factors: Miscellaneous Application Issues?

- **Timing**: Too early? Too late?
- **Weather**: dew, rain?
- **Herbicide formulation**: forgot herbicide? forgot surfactant?
- **Disturbance**: plants disturbed post treatment
- **Other targets**: minor inaccuracies in method due to non flowering *Phleum pretense*, *Holcus lanatus*, *Dactylus glomerata* also being targeted and thereby nominally affecting effectiveness data of RCG treatment.
Take Home: Conclusions and Recommendations

- Control of RCG is a multi-year endeavor and will take a minimum of 3 years under field conditions.
- WEATHER, WEATHER, WEATHER: major operational limitations to working with herbicide in SE AK.
- Catching up on a treatment backlog in SE AK is going to be challenging!
- With RCG backlog, what do we control, and when do we walk away?
- Rock pits?
- Strategy to keep RCG out of critical riparians, wetlands, estuaries