

Fall 2013 Red Spruce Planting

Unicoi Mountains, Graham County, NC

September til... however long it takes!



A conservation measure for Carolina northern flying squirrel (CNFS)

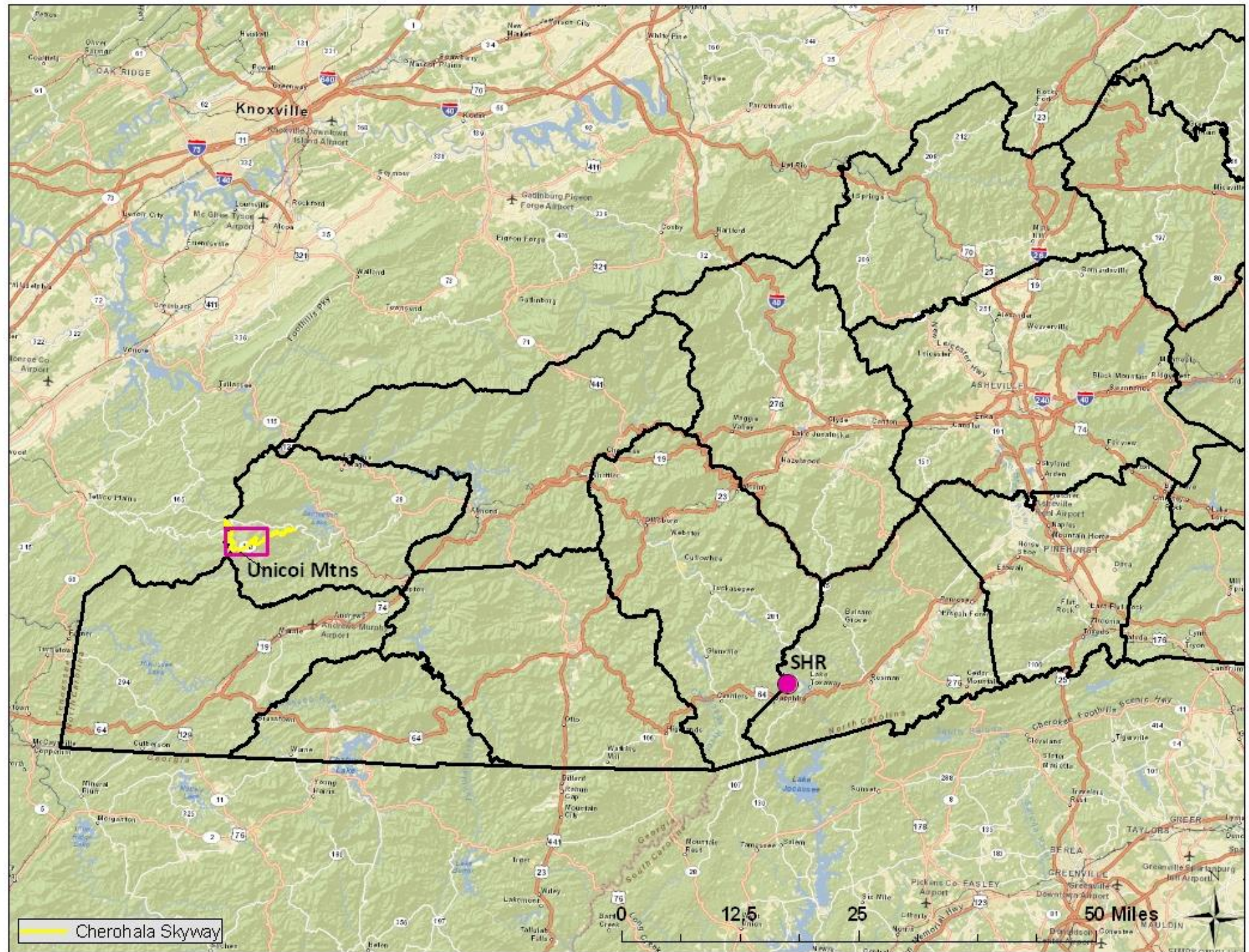
Purpose/Need: to supplant dying Hemlock to maintain a mixed conifer-northern hardwood forest for CNFS.

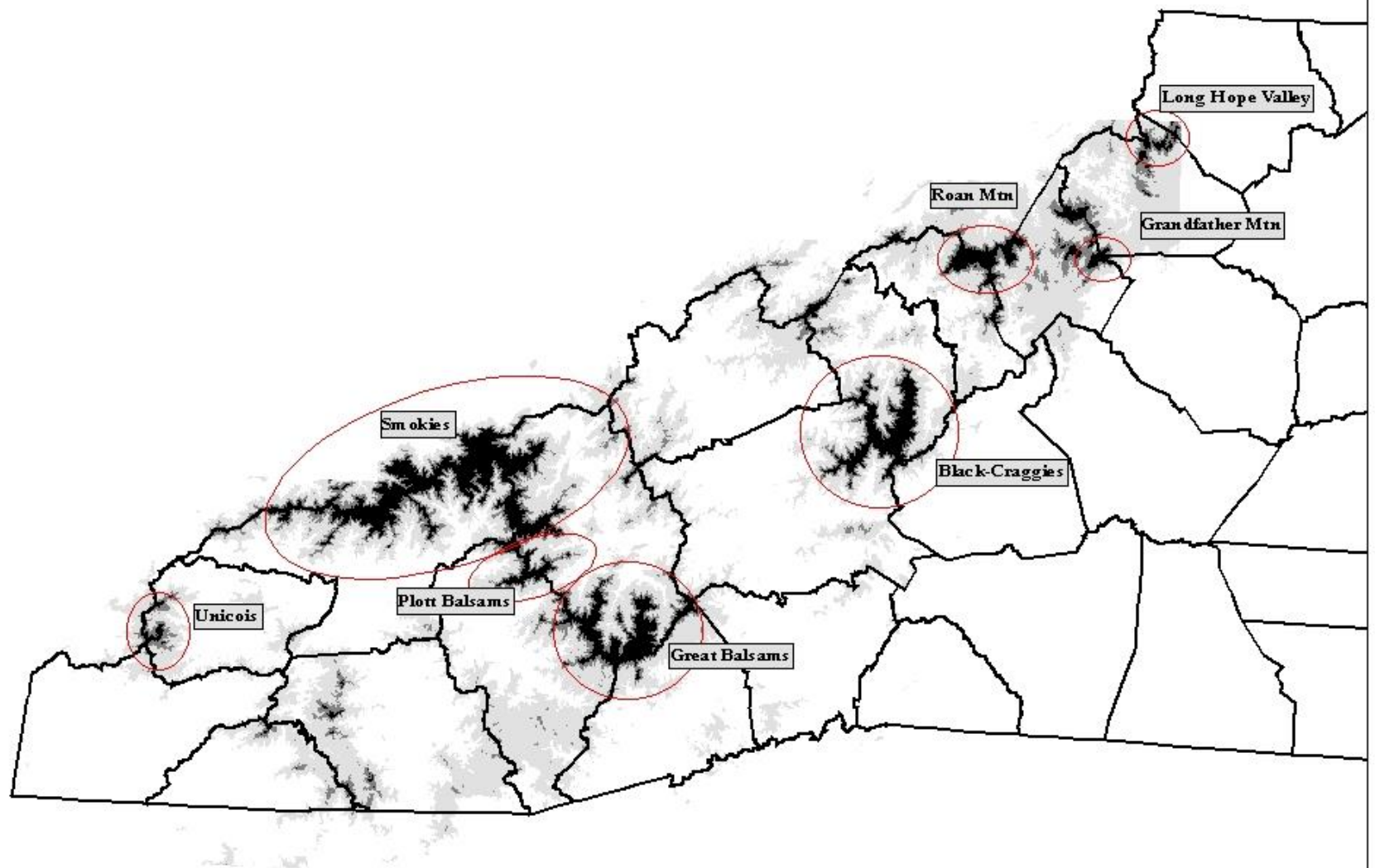
Importance of conifers to CNFS-

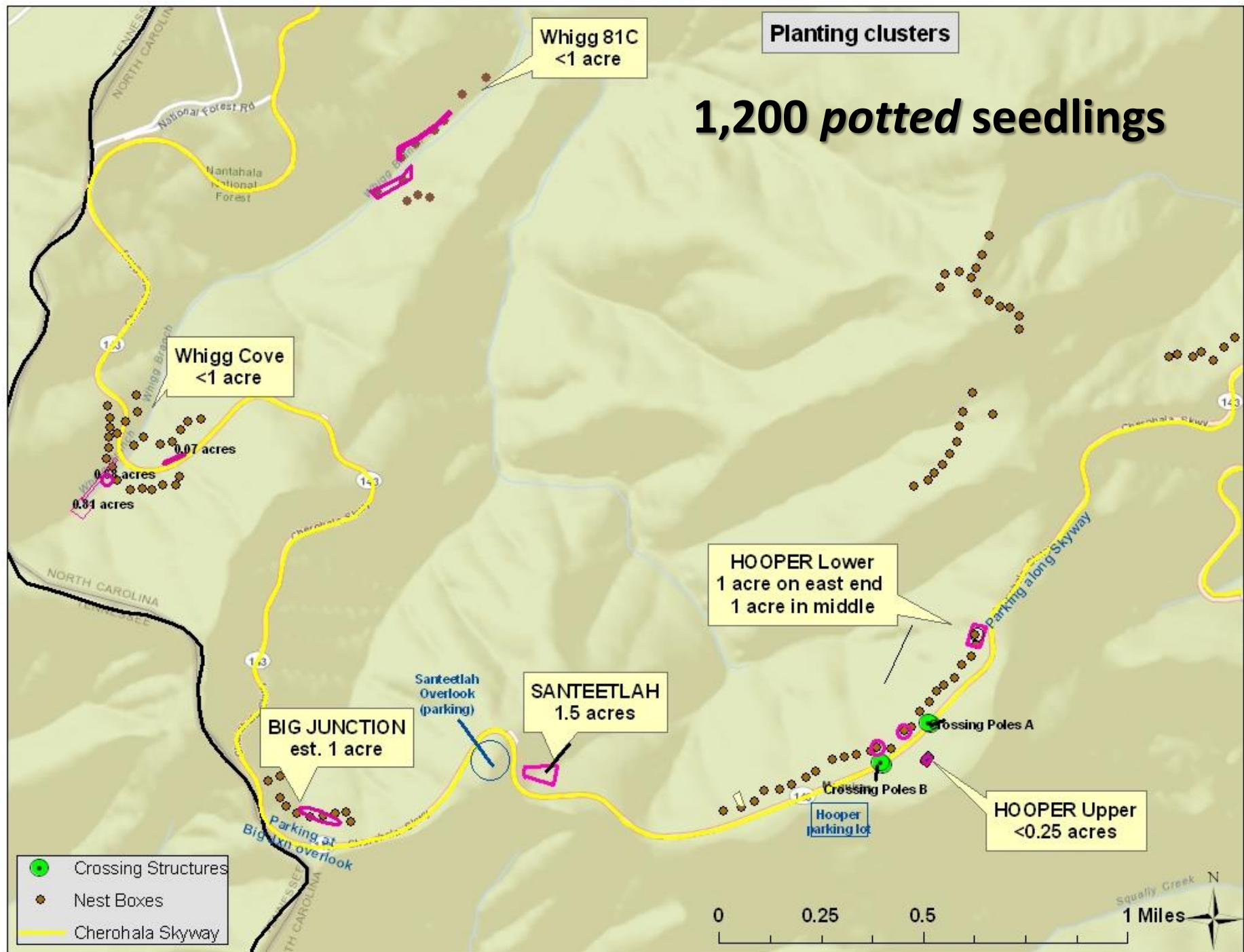
- Foraging, nesting, denning
- Parasite suppression?
- More females in Whigg Cove where hemlock is more extensive (Hughes et al. 2002).



Whigg Cove







Northern hardwood forest

- Yellow birch, buckeye, sugar maple, beech, hemlock.
- Sedge –vs- lush herbs, shrubs (ferns, *Viburnum lantanoides*, *Rubus*).
- Release work planned



Spruce seedlings planted in site w/ sedge dominated ground cover (top) and mixed herb and shrub layer (bottom)

Planting Densities

Spacing	Trees/acre
10x10 ft	436
11x11ft	360
12x12ft	303
14x14ft	222
20x20ft	109

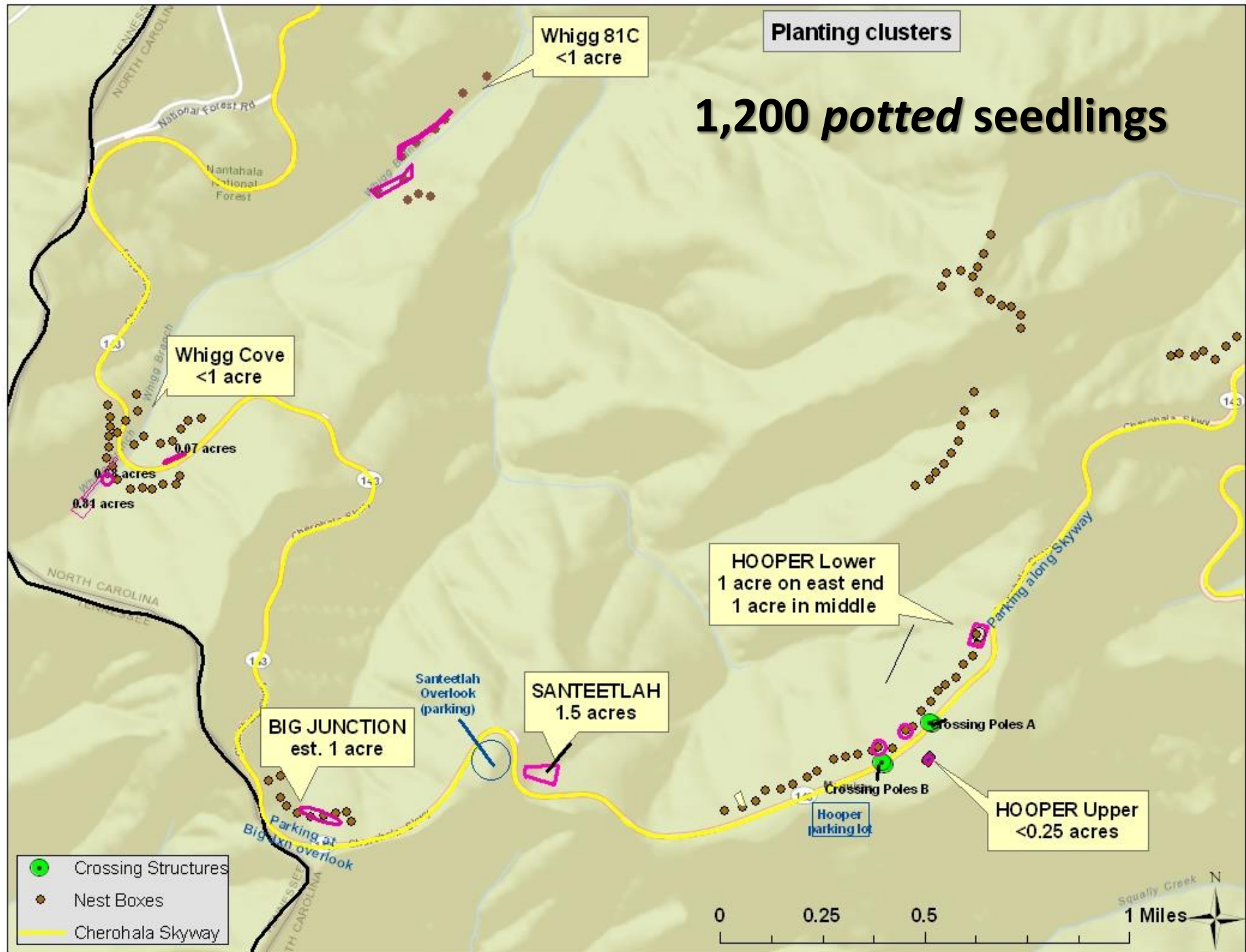
- Underplanting in NH
- Selected sites are $\sim\frac{1}{2}$ - 1 acre in size
- Trees per acre
- Space seedlings or Clump seedlings.
 - CASRI's experience



Scenario 1: Plant in 4 main areas at high density: ~ 5 dozen in Whigg Cove, rest at Santeetlah, Hoopers. $1140/3.75 \text{ ac} = 304$ per acre. Efficient.

Scenario 2: Plant in 5 main areas at lighter density: 5 dozen in Whigg Cove, then remaining 1100 at Big Jxn, Sant, Hoopers. $1,100/4.75 \text{ ac} = 231$ per acre.

Scenario 3: Plant 6 main areas (includ. Whigg 81C) at lighter density: ~ 100 at Whigg 81C, 5 dozen in Whigg Cove, then remaining 1020 at Big Jxn, Sant, Hoopers. $1,020/\sim 4.75 \text{ ac} = 215$ per acre.



Transport & Logistics

- **Pin Flagging**
- **Transport from SHR to Skyway**
 - 109 miles. 2.75 hour drive. Load & unload.
 - NCWRC staff, trucks, trailers. USFS trailer. ### seedlings at a time.
 - One trip for each planting “event” Fri, 9/13. Mon, 9/23, Fri, 10/11.
- **Transport from Skyway to planting site**
 - Steep roadbank. Zipline or hand-haul. Equipment and supplies. Traffic management. Before or day of planting?
- **Planting tools and tasks**
 - Rocky soils: planting bars, maddox, shovels, auger (loaned from USFS). Safety equipment (hardhats, gloves, glasses). Assembly line: carry in, dig holes, plant seedlings.



Planting Dates & Needs

- **Planting days scheduled:**
 - **Tues, 9/17** with ~20 HCC students.
 - **Tues, 9/24** with ~20 HCC students.
 - **Mon 10/14 & Tues 10/15 w?** 30 HCC students for half day (or longer if we have other help).
- **Additional planting event(s) needed?**
- How many we can plant in a day? Informal planting trips all Fall. Volunteers will be needed! Finish a few weeks before ground freezes.
- Leftovers: Skyway landslide, FP, etc.

Release & Monitoring

- Release work
 - Small diameter hardwoods
 - To be done gradually
 - Method
- Monitoring
 - Full count recommended due to small # of plants
 - Protocol?
- Red spruce is tolerant of shade. Seedlings of red spruce can establish in as little as 10 percent of full sunlight, but for optimum growth, at least 50 percent of full sunlight is needed.
- Red spruce responds to canopy removal even after many years of suppression.

<http://www.fs.fed.us/database/feis/plants/tree/picrub/all.html>

Meet the Seedlings

Collected by NCWRC in 2009 from the Great Balsams. SHR germinated seeds and cared for seedlings.



Flag planting spots- soon!

PLANTING EVENT 1 – Tuesday, September 17th

- **Friday, 9/13** – Transport seedlings from SHR to Unicois and unload. Sat, 9/14 - Mon 9/16- finish moving seedlings.
- **Tues, 9/17-** 1st Planting Day w/ 20 HCC Forestry students. 9AM-4PM.

PLANTING EVENT 2 – Tuesday, September 24th

- Mon, 9/23- Transport seedlings from SHR to Unicois and unload.
- Tues, 9/24- 2nd Planting Day w/ 20 HCC Forestry students. 9AM-4PM.

PLANTING EVENT 3 – Mon-Tues, October 14-15th

- Fri, 10/11- Transport seedlings from SHR to Unicois. Begin unloading .
- Mon, 10/14 & Tues, 10/15- Planting Days with 30 Haywood CC Dendrology students. 10AM-1PM or later if others can stay.

Seedling Transport: Transport from SHR to Unicois & offloading down roadbank.
Help needed: trucks, trailers, zipline equipment, people loading & unloading, traffic mgt.

Planting Days: Planting tools, safety equipment. Planting instructions. Plant ### seedlings.

Calendar

September 2013								
	Su	Mo	Tu	We	Th	Fr	Sa	
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	
	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>	<u>14</u>	
	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	<u>20</u>	<u>21</u>	
	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	<u>27</u>	<u>28</u>	
	<u>29</u>	<u>30</u>						

October 2013								
	Su	Mo	Tu	We	Th	Fr	Sa	
			<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	
	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>11</u>	<u>12</u>	
	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	<u>18</u>	<u>19</u>	
	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	<u>25</u>	<u>26</u>	
	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>			



Transport SHR-Skyway.
Transfer seedlings downslope.



Planting Day.

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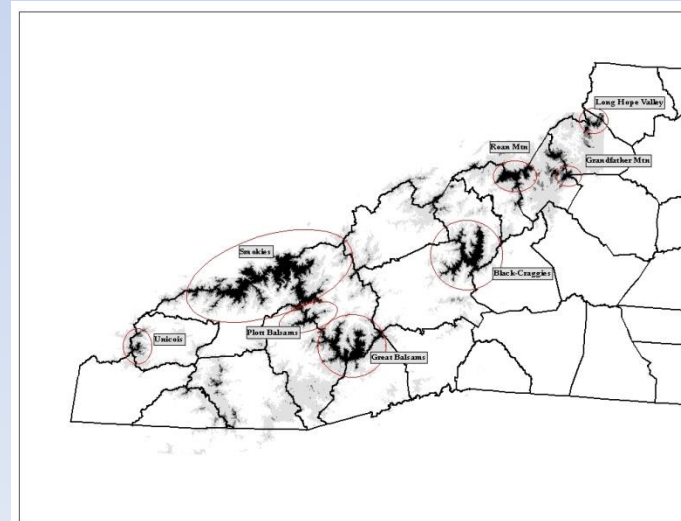
(828) 230-1320

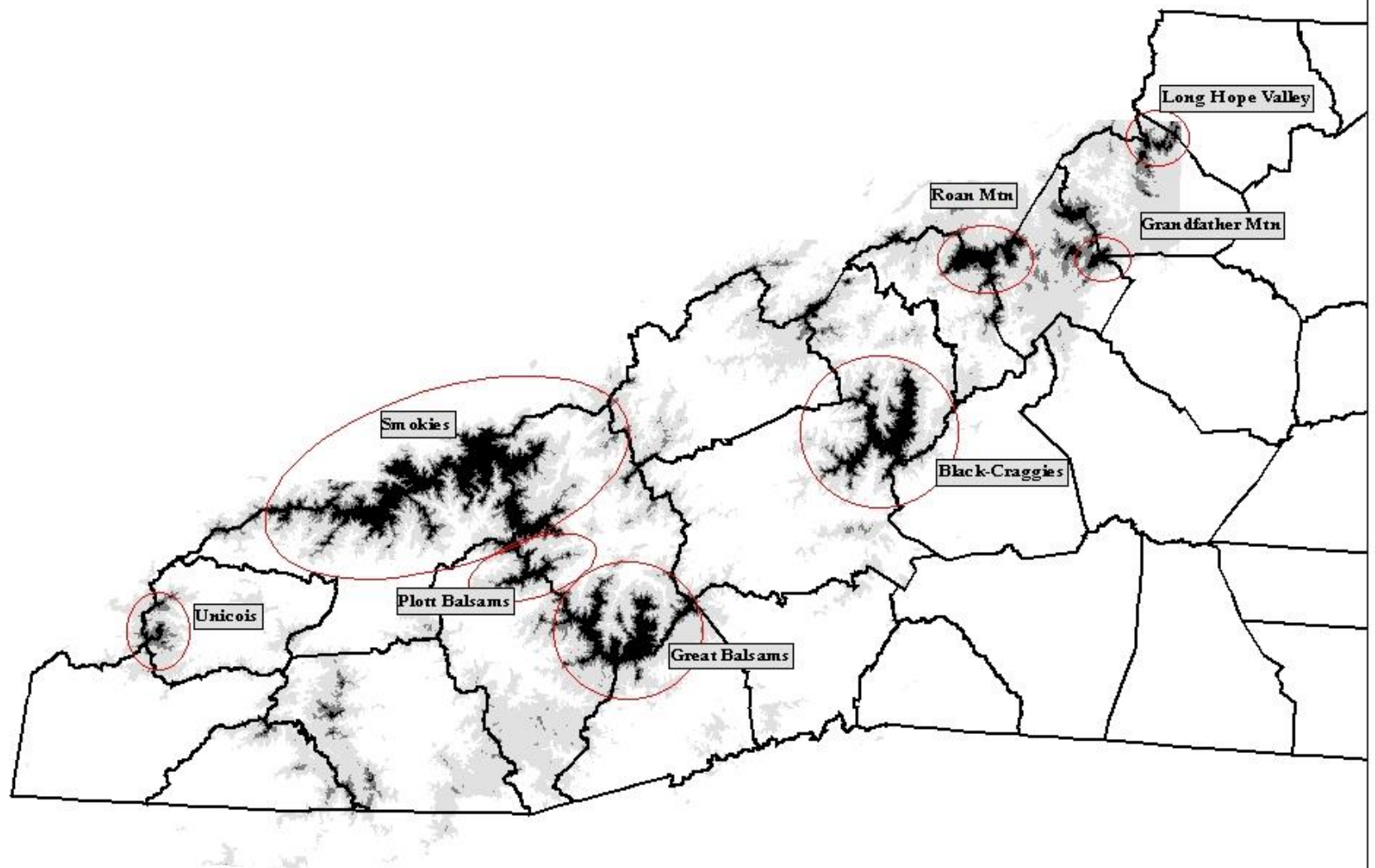
Cone Collection - Fall 2013



Promising 2013 spruce cone crop

- **Plott Balsams-** Waterrock Knob parking lot
- **Great Balsams–** Richland Balsam, Beartrail Ridge, Roy Taylor overlook. But not at Mt. Pisgah. Fraser fir cone crop too.
- **Black Mountains-** Bald Knob Ridge, AVL Watershed, mp 353-360, Commissary Ridge Trail (trees are loaded). Fraser fir too.
- **Great Smoky Mtns-** Clingman's Dome Road
- Roan? Unaka? Mt. Rogers?
- Long Hope- poor crop, per groundskeeper
- Grandfather Mtn- light crop, per Jesse Pope





Logistics for collecting

- **Window-** *mid Sept. – ear. Nov.*
- **Coordination-** permits, staff, vols
- **Metadata**
- **Collecting method-**
 - Ground (beneath tree, Boomer cache)
 - Tree (climb, other methods)
- **Selecting cones**
 - Distinguishing fresh, old, insect-damaged, moldy. Examples for vols.
- **Repository-** SHR, other?
- **Seed banking?**

Cone Collection Form

Plant name: Red Spruce (*Picea rubens*)

Date Collected: _____

Collector's Name: _____

State: _____

County: _____

Mountain Range: _____

Site Name: _____

Nearest town: _____

Coordinates in Decimal Degrees:

N Latitude _____ W. Longitude _____

Elevation: _____ ft

Aspect (degrees or simply "north", "northwest", etc): _____

Plants Growing in Association:

Advanced Regeneration of *Picea rubens*: Yes or No



LEFT: Red spruce old & fresh cones and branch.
CENTER: Red spruce cone
ABOVE: Fraser fir cones stand upright on branch, larger and rounder than spruce cones.

Train Volunteers

-Cone ID
 -Fresh vs old



Hemlock cones



Norway Spruce cones (avoid!)