



BOISE RIVER ENHANCEMENT NETWORK

Idaho Department of Lands Notch Habitat Enhancement Project



INTERIM REPORT

September 2021

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PART 1 PROJECT BACKGROUND

1.1 PROJECT PURPOSE

The purpose of the Notch Habitat Enhancement Project is to improve the riparian condition of an 0.11-acre property, referred to as the “Notch”, owned by the State of Idaho and managed by the Idaho Department of Lands (IDL) along the Boise River. The project aims to remove non-native and invasive species, plant and help establish native species, and study different methods to remove invasive false indigo (*Amorpha fruticosa*). The project is intended to serve as a pilot project that can be replicated at other locations along the Boise River.

1.2 PROJECT LOCATION

The project area is located in Garden City directly south of the Ulmer Lane Townhomes HOA, Inc. at N. Duxbury Pier Lane, 83714. Please see **Figure 1, Project Vicinity Map**.

1.3 EXISTING CONDITIONS

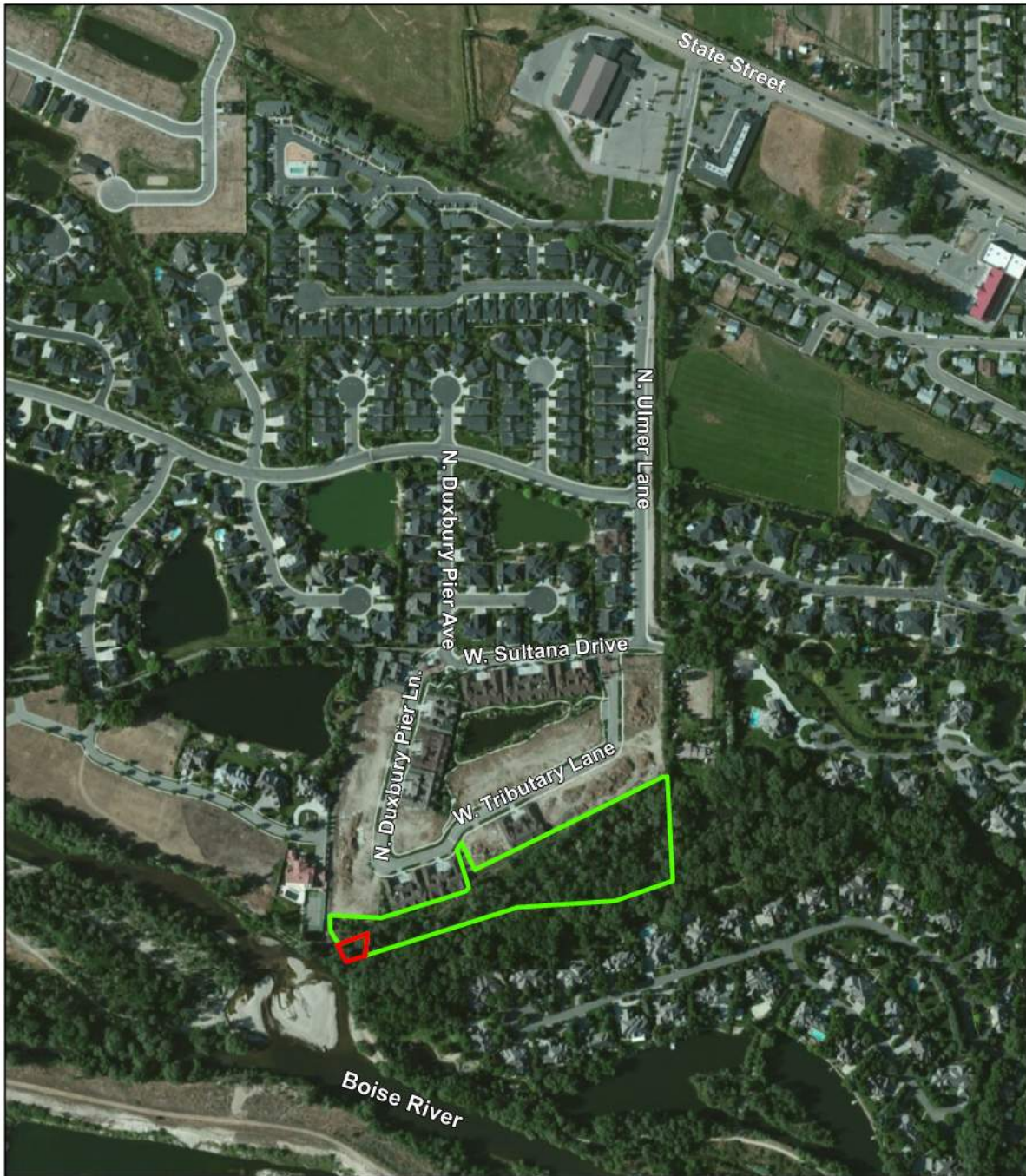
The project is located within the Boise River floodway in a low-lying riparian area. At its nearest point, the project area is approximately 50 feet from the Boise River.

Prior to project implementation, the project area contained a large number of non-native American elm (*Ulmus americana*), Tree of Heaven (*Ailanthus altissima*), and silver maple (*Acer saccharinum*), as well as dense thickets of invasive false indigo. Native flora species within and adjacent to the project area include black cottonwood (*Populus trichocarpa*), willow (*Salix* sp.), Wood’s rose (*Rosa woodsii*), red-osier dogwood (*Cornus sericea*), golden currant (*Ribes aeureum*), and poison ivy (*Toxicodendron radicans*).

1.4 PROJECT PHASES

The project is being sponsored by an adjacent landowner and will be carried out over a 2-year period in the following two (2) phases:

- **Phase 1 (Summer to Winter 2020):** develop project budget; hire project manager and professionals to remove undesired trees; develop study plan that includes multi-year management and monitoring of false indigo removal methods.
- **Phase 2 (Winter 2020 to Fall 2022):** engage volunteers in enhancement activities; establish study plots and reference plots; remove invasive false indigo as outlined in the study plan; carry out management and monitoring; prepare final study report; and share findings with stakeholders.



Legend



Notch Project Area



Ulmer HOA Parcel

0 250 500 Feet

1:5,000



Figure 1. IDL "Notch" Project Vicinity Map

PART 2 RIPARIAN ENHANCEMENT

To enhance the riparian condition of the Notch project area, both invasive/non-native species removal and native species plantings need to be carried out throughout the year, typically spring through fall. This is especially important following invasive/non-native tree removal, as such disturbance can lead to further encroachment of invasive species.

2.1 ENHANCEMENT ACTIVITIES

Table 1 lists the enhancement activities that have been conducted at the Notch project area since project implementation.

Table 1. Enhancement Activities

Date	Enhancement Activity	No. Volunteers	No. Volunteer Hours
10/22/2020	Volunteers oversee professional fellers that removed non-native American elm, Tree of Heaven, silver maple saplings, and false indigo. The stumps of all live trees were treated with Pathfinder® II.	2	6
11/13/2020	First treatment (except for control) of false indigo in plots. All false indigo outside of plots removed and treated.	20	63
11/13/2020	Black cottonwood seedlings planted, and existing cottonwood trees wrapped with wire.		
3/19/2021	Two (2) large bushels of willow cuttings and ten (10) black cottonwood seedlings were planted.	7	21
4/12/2021	Approximately twelve (12) Wood's rose planted along the greenbelt to act as a visual barrier (future) to the property.	5	7.5
4/2021 – 8/2021	Weekly watering of planted vegetation	2	30
5/21/2021	Monitoring performed in study plots. Second treatment (except for control) of false indigo in plots. All false indigo outside of plots removed and treated. Removal of Siberian elm and silver maple seedlings.	11	33
5/21/2021	One (1) Oregon grape (<i>Mahonia repens</i>) planted. Attend and water other native plantings.		
7/01/2021	Monitoring performed in study plots; no removal or treatment.	1	2
8/06/2021	Monitoring performed in study plots. Second treatment (except for control) of false indigo in plots. All false indigo outside of plots removed and treated.	12	38
8/12/2021	Removal of silver maple seedlings, bittersweet nightshade (<i>Solanum dulcamara</i>) vines, and approximately 30 resprouting Tree of Heaven; herbicide applied to some of the larger plants.	6	15
8/12/2021	False indigo was hand-pulled in new location that is exposed to the sun; no herbicide was applied. Purpose is to observe whether it resprouts during the summer heat and dry period.		
Total To-Date		70	215.5

2.2 ENHANCEMENT RESULTS



10/21/2020 - Notch project area before project initiation.



10/21/2020 - Notch project area following after non-native tree and shrub removal.



11/13/2020 - Volunteers brave the snow and rain to remove invasives, plant cottonwoods, and wrap trees.



3/19/2021 - Volunteers plant two large bushels of willow stakes and cottonwood seedlings.



04/12/2021 - Volunteers plant Wood's rose along the greenbelt path.



05/21/2021 - Volunteers remove and treat false indigo in one of the plots. Monitoring performed.



07/01/2021 – Monitoring performed. Most of the regrowth is of native species. The treated study plots appear to fare better than non-treated study plots.



08/12/2021 – Native species were flagged (pink) and watered. Over three dozen non-native resprouts were pulled.

PART 3 FALSE INDIGO REMOVAL STUDY

False indigo (*Amorpha fruticosa*) is an invasive shrub that has become a major problem in the Lower Boise River Watershed. It has an extensive root system, grows in dense thickets, and is mostly left alone by native herbivores and insects. It can quickly colonize and push out native species, such as willow and cottonwood. Previous removal efforts in the area have had minimal success, prompting the need to study and identify successful removal methods.

3.1 FALSE INDIGOMONITORING AND MANAGEMENT

Establish Study Plots and Reference Site: Six (6) study plots were established, each 6 meters (m) x 6 m in size: four (4) plots serve as treatment plots and two (2) serve as control plots. The study plots are further divided further into four (4) subplots for monitoring (see **Figure 2, Study Plot Map**). Fencing stakes and flagging was used to identify the study plot boundaries.

Remove False Indigo: False indigo be removed in all study plots using pruning loppers at a length of approximately 6 inches. Those receiving herbicide will be immediately treated following pruning with either of Pathfinder® II or Garlon® 4 specialty herbicides.

The six plots will be randomly-selected for one of the following false indigo treatments:

- Two (2) plots pruned to within 6 inches (in) of base and treated with Pathfinder® II.
- Two (2) plots pruned to within 6 in of base and treated with Garlon® 4.
- Two (2) pruned to within 6 in of base and left untreated, serving as the “control”.

At least six (6) volunteers will be required to carry out the work: two (2) removing false indigo with loppers; two (2) applying herbicide; and two (2) managing removed vegetation. It is anticipated that monitoring, removal and treatment can be completed in one (1) workday.



False indigo (*Amorpha fruticosa*)

Carry out Monitoring and Management: Four (4) subplots, each 3 m X 3 m in size, will be established within each study plot, for a total of twenty-four (24) subplots (see **Figure 2**). Within each subplot, the canopy cover class of false indigo will be identified by visually estimating the relative proportion of the subplot that is covered by the plant(s) using the Daubenmire Cover Class Method described in **Part 2** of this report. The study plots will be monitored and treated in spring, summer, and fall for a minimum of two (2) years.

STUDY PLOTS

The following six (6) study plots were randomly-selected:

1. **Plot 1 = Pathfinder**, pruned to within 6” of base and treated with Pathfinder® II
2. **Plot 2 = Control**, pruned to within 6” of base and left untreated
3. **Plot 3 = Pathfinder**, pruned to within 6” of base and treated with Pathfinder® II
4. **Plot 4 = Control**, pruned to within 6” of base and left untreated
5. **Plot 5 = Garlon**, pruned to within 6” of base and treated with Garlon® 4
6. **Plot 6 = Garlon**, pruned to within 6” of base and treated with Garlon® 4

SUBPLOTS

All six (6) plots were divided into four (4) subplots (designated as a, b, c or d), for a total of 24 subplots (see **Figure 3** for plot and subplot locations).

CANOPY COVER

Within each subplot, the canopy cover class of false indigo will be identified by visually estimating the relative proportion of the subplot that is covered by the plant(s).

For this study, canopy cover will be used. Canopy cover can be determined by drawing a circle around the circumference of the canopy of the plant; all of the area inside the circle represents the “cover”, as shown in the drawing to the right.

DAUBENMIRE COVER CLASS METHOD

The Daubenmire Cover Class Method provides semi-quantitative approach that can be done rapidly and eliminates the need for “precise” estimation of canopy cover. Instead, canopy cover is assigned to one of six (6) classes shown below.

REMOVAL AND TREATMENT

False indigo will be removed in all study plots within a length of approximately 6 inches by using pruning loppers. Those receiving herbicide will be immediately spot-treated by hand (via a spray bottle or sponge) following pruning with either of Pathfinder® II or Garlon® 4 specialty herbicides. Outside of the plots, all false indigo will be removed in the same manner and treated with either of Pathfinder® II or Garlon® 4 specialty herbicides.

3.2 MONITORING RESULTS

This section will be updated following fall 2021 monitoring.



Legend — Garden City Greenbelt

Project Area Study Plots Subplots

0 3 6 Meters

1:250



Figure 2. IDL "Notch" Project Study Plots

APPENDIX A MONITORING METHODS

STUDY PLOTS

The following six (6) study plots were randomly-selected:

7. **Plot 1 = Pathfinder**, pruned to within 6" of base and treated with Pathfinder® II
8. **Plot 2 = Control**, pruned to within 6" of base and left untreated
9. **Plot 3 = Pathfinder**, pruned to within 6" of base and treated with Pathfinder® II
10. **Plot 4 = Control**, pruned to within 6" of base and left untreated
11. **Plot 5 = Garlon**, pruned to within 6" of base and treated with Garlon® 4
12. **Plot 6 = Garlon**, pruned to within 6" of base and treated with Garlon® 4

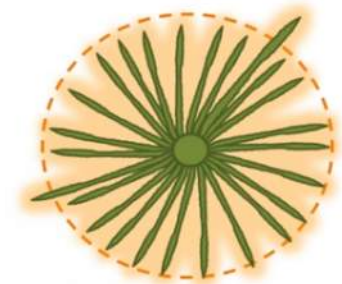
SUBPLOTS

All six (6) plots were divided into four (4) subplots (designated as a, b, c or d), for a total of 24 subplots (see **Figure 3** for plot and subplot locations).

CANOPY COVER

Within each subplot, the canopy cover class of false indigo will be identified by visually estimating the relative proportion of the subplot that is covered by the plant(s).

For this study, canopy cover will be used. Canopy cover can be determined by drawing a circle around the circumference of the canopy of the plant; all of the area inside the circle represents the "cover", as shown in the drawing to the right.



DAUBENMIRE COVER CLASS METHOD

The Daubenmire Cover Class Method provides semi-quantitative approach that can be done rapidly and eliminates the need for "precise" estimation of canopy cover. Instead, canopy cover is assigned to one of six (6) classes shown below.



DAUBENMIRE COVER CLASS METHODS STEPS

Step 1. Examine target species (false indigo) growing in each subplot and visually estimate the percent of live canopy cover and assign one of the following cover classes:

1. Trace - 5%
2. 6% - 25%
3. 26%-50%
4. 51%-75%
5. 76%-95%
6. 96%-100%

Step 2. Assign the “midpoint” as the percent cover for the subplot based on the class:

1. Trace - 5% = 2.5%
2. 6% - 25% = 15%
3. 26%-50% = 37.5%
4. 51%-75% = 62.5%
5. 76%-95% = 85%
6. 96%-100% = 97.5%

Step 3. Calculate the mean canopy cover by plot by averaging the four subplots.

In the example below, cover classes and “midpoint” percent cover were identified for each of the four subplots of Plot 1. The midpoint percentages are then averaged to find the mean percent cover for Plot 1.

PLOT 1		MEAN PLOT 1
Subplot 1a Class 1 2.5%	Subplot 1b Class 2 15%	$2.5\% + 15\% + 37.5\% + 37.5\%$ $\div 4 =$ 18.1%
Subplot 1c Class 3 37.5%	Subplot 1d Class 3 37.5%	

Step 4. Record all data on the monitoring data form (**Appendix A**) for each plot prior to pruning and designated treatment.

REMOVAL AND TREATMENT

False indigo will be removed in all study plots within a length of approximately 6 inches by using pruning loppers. Those receiving herbicide will be immediately spot-treated by hand (via a spray bottle or sponge) following pruning with either of Pathfinder® II or Garlon® 4 specialty herbicides. Outside of the plots, all false indigo will be removed in the same manner and treated with either of Pathfinder® II or Garlon® 4 specialty herbicides.

MONITORING DATA FORM
PROJECT: The Notch Project

DATE:
NAME:

PLOT 1		MEAN %CANOPY COVER
Subplot 1a Cover Class: Midpoint:	Subplot 1b Cover Class: Midpoint:	
Subplot 1c Cover Class: Midpoint:	Subplot 1d Cover Class: Midpoint:	
PLOT 2		MEAN %CANOPY COVER
Subplot 2a Cover Class: Midpoint:	Subplot 2b Cover Class: Midpoint:	
Subplot 2c Cover Class: Midpoint:	Subplot 2d Cover Class: Midpoint:	
PLOT 3		MEAN %CANOPY COVER
Subplot 3a Cover Class: Midpoint:	Subplot 3b Cover Class: Midpoint:	
Subplot 3c Cover Class: Midpoint:	Subplot 3d Cover Class: Midpoint:	
PLOT 4		MEAN %CANOPY COVER
Subplot 4a Cover Class: Midpoint:	Subplot 4b Cover Class: Midpoint:	
Subplot 4c Cover Class: Midpoint:	Subplot 4d Cover Class: Midpoint:	
PLOT 5		MEAN %CANOPY COVER
Subplot 5a Cover Class: Midpoint:	Subplot 5b Cover Class: Midpoint:	
Subplot 5c Cover Class: Midpoint:	Subplot 5d Cover Class: Midpoint:	
PLOT 6		MEAN %CANOPY COVER
Subplot 6a Cover Class: Midpoint:	Subplot 6b Cover Class: Midpoint:	
Subplot 6c Cover Class: Midpoint:	Subplot 6d Cover Class: Midpoint:	

APPENDIX B COMPLETED MONITORING DATA FORMS AND PHOTOS

MONITORING DATA FORM

PROJECT: THE NOTCH PROJECT

DATE: MAY 21, 2021

NAME: ROGER ROSENTERE, TAMSEN BINGGELI

PLOT 1		MEAN %CANOPY COVER
Subplot 1a Cover Class: 1 Midpoint: 2.5%	Subplot 1b Cover Class: 1 Midpoint: 2.5%	8.75%
Subplot 1c Cover Class: 2 Midpoint: 15%	Subplot 1d Cover Class: 2 Midpoint: 15%	
PLOT 2		MEAN %CANOPY COVER
Subplot 2a Cover Class: 3 Midpoint: 37.5%	Subplot 2b Cover Class: 3 Midpoint: 37.5%	31.88%
Subplot 2c Cover Class: 3 Midpoint: 37.5%	Subplot 2d Cover Class: 2 Midpoint: 15%	
PLOT 3		MEAN %CANOPY COVER
Subplot 3a Cover Class: 2 Midpoint: 15%	Subplot 3b Cover Class: 1 Midpoint: 2.5%	11.88%
Subplot 3c Cover Class: 2 Midpoint: 15%	Subplot 3d Cover Class: 2 Midpoint: 15%	
PLOT 4		MEAN %CANOPY COVER
Subplot 4a Cover Class: 2 Midpoint: 15%	Subplot 4b Cover Class: 2 Midpoint: 15%	8.75%
Subplot 4c Cover Class: 1 Midpoint: 2.5%	Subplot 4d Cover Class: 1 Midpoint: 2.5%	
PLOT 5		MEAN %CANOPY COVER
Subplot 5a Cover Class: 1 Midpoint: 2.5%	Subplot 5b Cover Class: 1 Midpoint: 2.5%	2.5%
Subplot 5c Cover Class: 1 Midpoint: 2.5%	Subplot 5d Cover Class: 1 Midpoint: 2.5%	
PLOT 6		MEAN %CANOPY COVER
Subplot 6a Cover Class: 1 Midpoint: 2.5%	Subplot 6b Cover Class: 1 Midpoint: 2.5%	2.5%
Subplot 6c Cover Class: 1 Midpoint: 2.5%	Subplot 6d Cover Class: 1 Midpoint: 2.5%	



Plot # 1 (Pathfinder) in May 2021, Mean percent canopy cover 8.75%.



Plot #2 (Control) in May 2021, mean percent canopy cover 31.88%.



Plot #3 (Pathfinder) in May 2021, mean percent canopy cover 11.88%.



Plot #4 (Control) in May 2021, mean percent canopy cover 8.75%.



Plot #5 (Garlon) in May 2021, mean percent canopy cover 2.5%.



Plot #6 (Garlon) in May 2021, mean percent canopy cover 2.5%.

MONITORING DATA FORM

PROJECT: THE NOTCH PROJECT

DATE: JULY 1, 2021

NAME: ROGER ROSENTERER

PLOT 1		MEAN %CANOPY COVER
Subplot 1a Cover Class: 1 Midpoint: 2.5%	Subplot 1b Cover Class: 2 Midpoint: 15%	5.00%
Subplot 1c Cover Class: 1 Midpoint: 2.5%	Subplot 1d Cover Class: Trace Midpoint: 0%	
PLOT 2		MEAN %CANOPY COVER
Subplot 2a Cover Class: 3 Midpoint: 37.5%	Subplot 2b Cover Class: 3 Midpoint: 37.5%	26.25%
Subplot 2c Cover Class: 2 Midpoint: 15%	Subplot 2d Cover Class: 2 Midpoint: 15%	
PLOT 3		MEAN %CANOPY COVER
Subplot 3a Cover Class: 2 Midpoint: 15%	Subplot 3b Cover Class: 2 Midpoint: 15%	11.25%
Subplot 3c Cover Class: 2 Midpoint: 15%	Subplot 3d Cover Class: Trace Midpoint: 0%	
PLOT 4		MEAN %CANOPY COVER
Subplot 4a Cover Class: 3 Midpoint: 37.5%	Subplot 4b Cover Class: 3 Midpoint: 37.5%	37.50%
Subplot 4c Cover Class: 3 Midpoint: 37.5%	Subplot 4d Cover Class: 3 Midpoint: 37.5%	
PLOT 5		MEAN %CANOPY COVER
Subplot 5a Cover Class: 2 Midpoint: 15%	Subplot 5b Cover Class: 2 Midpoint: 15%	7.5%
Subplot 5c Cover Class: Trace Midpoint: 0%	Subplot 5d Cover Class: Trace Midpoint: 0%	
PLOT 6		MEAN %CANOPY COVER
Subplot 6a Cover Class: 2 Midpoint: 15%	Subplot 6b Cover Class: 2 Midpoint: 15%	7.5%
Subplot 6c Cover Class: Trace Midpoint: 0%	Subplot 6d Cover Class: Trace Midpoint: 0%	



Plot # 1 (Pathfinder) in July 2021, Mean percent canopy cover 5.0%.



Plot #2 (Control) in July 2021, mean percent canopy cover 26.25%.



Plot #3 (Pathfinder) in July 2021, mean percent canopy cover 11.25%.



Plot #4 (Control) in July 2021, mean percent canopy cover 37.5%.



Plot #5 (Garlon) in July 2021, mean percent canopy cover 7.5%.



Plot #5 (Garlon) in July 2021, mean percent canopy cover 7.5%.

MONITORING DATA FORM

PROJECT: THE NOTCH PROJECT

DATE: 08/06/2021

NAME: TAMSEN BINGGELI

PLOT 1		MEAN %CANOPY COVER
Subplot 1a Cover Class: None Midpoint: 0%	Subplot 1b Cover Class: 1 Midpoint: 2.5%	0.63%
Subplot 1c Cover Class: None Midpoint: 0%	Subplot 1d Cover Class: None Midpoint: 0%	
PLOT 2		MEAN %CANOPY COVER
Subplot 2a Cover Class: 1 Midpoint: 2.5%	Subplot 2b Cover Class: 2 Midpoint: 15%	23.13%
Subplot 2c Cover Class: 3 Midpoint: 37.5%	Subplot 2d Cover Class: 3 Midpoint: 37.5%	
PLOT 3		MEAN %CANOPY COVER
Subplot 3a Cover Class: None Midpoint: 0%	Subplot 3b Cover Class: 1 Midpoint: 2.5%	0.63%
Subplot 3c Cover Class: None Midpoint: 0%	Subplot 3d Cover Class: None Midpoint: 0%	
PLOT 4		MEAN %CANOPY COVER
Subplot 4a Cover Class: 3 Midpoint: 37.5%	Subplot 4b Cover Class: 2 Midpoint: 15 %	31.88%
Subplot 4c Cover Class: 3 Midpoint: 37.5%	Subplot 4d Cover Class: 3 Midpoint: 37.5%	
PLOT 5		MEAN %CANOPY COVER
Subplot 5a Cover Class: 1 Midpoint: 2.5%	Subplot 5b Cover Class: None Midpoint: 0%	0.63%
Subplot 5c Cover Class: None Midpoint: 0%	Subplot 5d Cover Class: None Midpoint: 0%	
PLOT 6		MEAN %CANOPY COVER
Subplot 6a Cover Class: None Midpoint: 0%	Subplot 6b Cover Class: 1 Midpoint: 2.5%	0.63%
Subplot 6c Cover Class: None Midpoint: 0%	Subplot 6d Cover Class: None Midpoint: 0%	



Plot # 1 (Pathfinder) in August 2021, Mean percent canopy cover 0.63%.



Plot #2 (Control) in August 2021, mean percent canopy cover 23.13%.



Plot #3 (Pathfinder) in August 2021, mean percent canopy cover 0.63%.



Plot #4 (Control) in August 2021, mean percent canopy cover 31.88%.



Plot #5 (Garlon) in August 2021, mean percent canopy cover 0.63%.



Plot #6 (Garlon) in August 2021, mean percent canopy cover 0.63%.