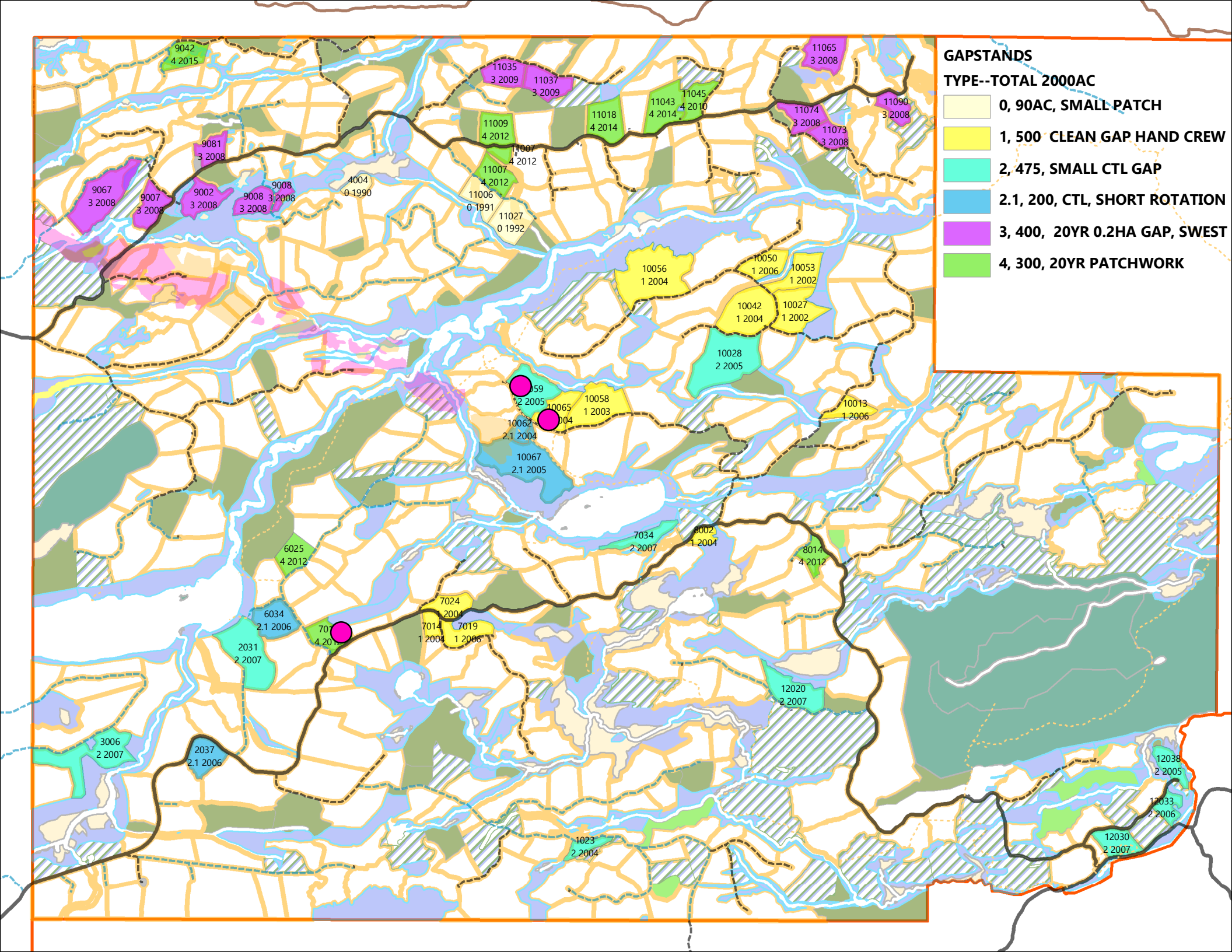
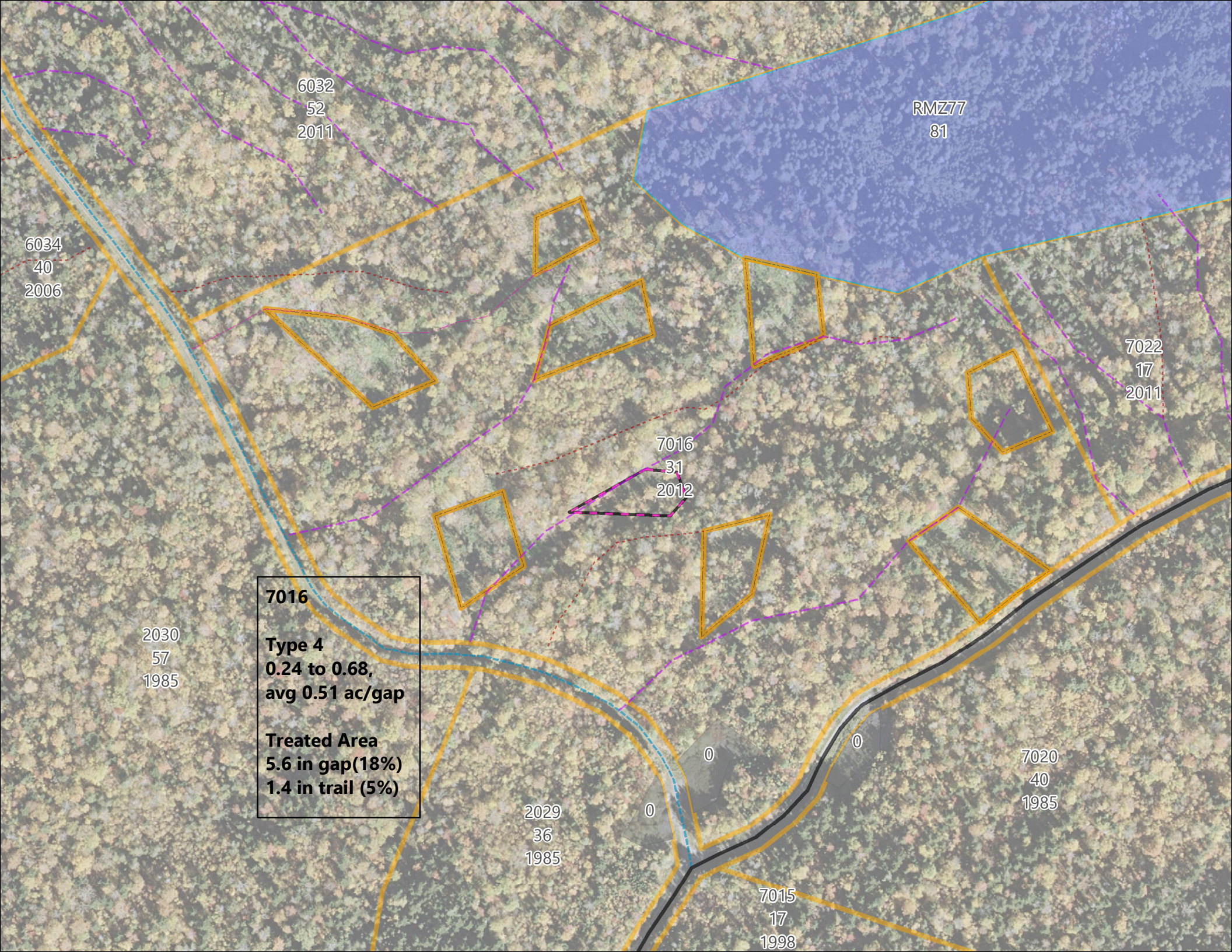
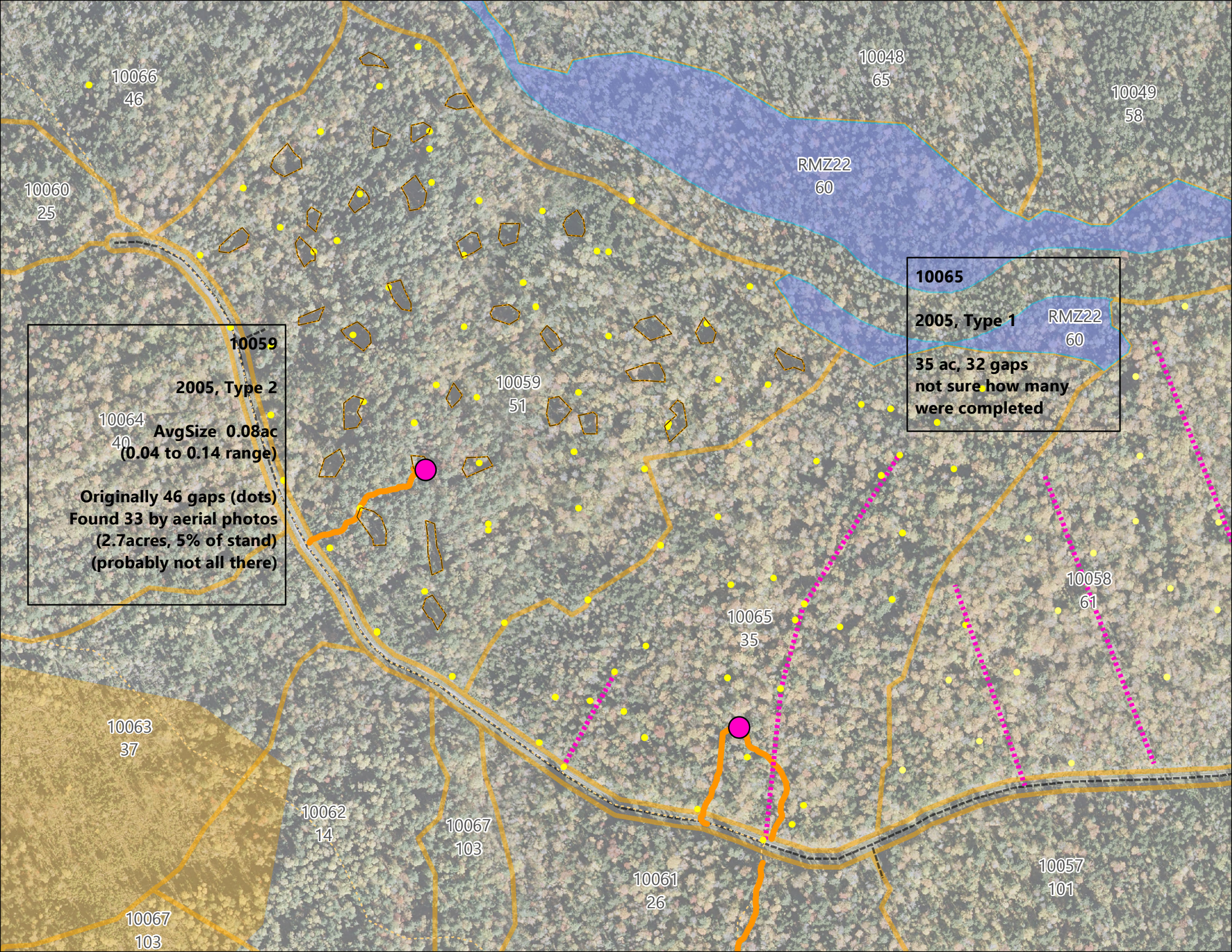

GAPSTANDS
TYPE--TOTAL 2000AC
0, 90AC, SMALL PATCH
1, 500 CLEAN GAP HAND CREW
2, 475, SMALL CTL GAP
2.1, 200, CTL, SHORT ROTATION
3, 400, 20YR 0.2HA GAP, SWEST
4, 300, 20YR PATCHWORK
9042 4 2015
11035 3 2009
11037 3 2009
11065 3 2008
11043 4 2014
11045 4 2010
11090 3 2008
11074 3 2008
11073 3 2008
11018 4 2014
11009 4 2012
11007 4 2012
9081 3 2008
9067 3 2008
9007 3 2008
9002 3 2008
9008 3 2008
9008 3 2008
4004 0 1990
11007 4 2012
11006 0 1991
11027 0 1992
10056 1 2004
10050 1 2006
10053 1 2002
10042 1 2004
10027 1 2002
10028 2 2005
10058 1 2003
10065
10062 2.1 2004
10067 2.1 2005
10013 1 2006
6025 4 2012
7034 2 2007
8002 1 2004
8014 4 2012
7024 1 2004
7014 1 2004
7019 1 2006
6034 2.1 2006
2031 2 2007
12020 2 2007
3006 2 2007
2037 2.1 2006
1023 2 2004
12038 2 2005
12033 2 2006
12030 2 2007

Evolution of GapStyle Silviculture in the SFMA

9.25.15

	JB v.1	JB v.2	*JB v.2.1*	CR v.3	RM v.4
Site Selection	HW, high site with RS component	HW, high site with RS component	***burn history with QA/BT/BF overstory***	previously SW-established SF type on north end	mature overstory, patchy regen, tolernat/mid tolerant composition
Gap Placement/config	random GPS pts	random GPS pts	*random GPS pts*	gridded GPS points	planned patchwork
Shape	ellipse	ellipse	*ellipse*	clover	free polygon
Size	0.08 to 0.11ac	0.15ac, 0.06 to 0.33	*0.15ac, 0.06 to 0.34*	0.19	0.33ac, 0.13 to 0.75
RX size	0.08ac	0.115	*0.115*	0.2	(laidout)
Rotation Length	140	140	***50***	140	140
Operational Cutting Cycle	10	10	*10*	20	20
Equipment Mix	**C--S--FW**	**CTL**	*CTL*	CTL	CTL
Trail Area	3%	6%	*10%*	3% (outside gap)	3% (outside gap)
Intended % Area Treated	7%	7%	*18%*	20%	20%
Total treated	10%	13%	*28%*	23%	23%
Retention Protocols	long lived >20", sm<16", rs<8"	long lived >20", sm<16", rs<8"			
Semantics	Group Selection	Group Selection	Irregular Group Shelterwood	Irregular Group Shelterwood	Irregular Group Shelterwood
Stand Examples	10058 10065 10028	10028 10059	10067	9068 9007	7016 8014 6025


6032
52
2011
RMZ77
81
6034
40
2006
7022
17
2011
7016
31
2012
7016
Type 4
0.24 to 0.68,
avg 0.51 ac/gap
Treated Area
5.6 in gap(18%)
1.4 in trail (5%)
2030
57
1985
0
0
0
2029
36
1985
7020
40
1985
7015
17
1998


10066
46
10048
65
10049
58
RMZ22
60
10060
25
10065
2005, Type 1
RMZ22
60
35 ac, 32 gaps
not sure how many
were completed
10059
2005, Type 2
10064
40
AvgSize 0.08ac
(0.04 to 0.14 range)
Originally 46 gaps (dots)
Found 33 by aerial photos
(2.7acres, 5% of stand)
(probably not all there)
10059
51
10058
61
10065
35
10063
37
10062
14
10067
103
10061
26
10057
101
10067
103

GapNotes

9-25-15 EPS

Why do we do this?

Create multiaged condition (area based) complex and fine scale structural variation
Protect and promote delicate advance regeneration (esp spruce in hardwoods)
[Emulate/mimic/imitate/pattern after/compare to/base on] natural disturbance regime
Coarse Filter approach-
Maintain composition, structure, ecosystem function in natural range of variability

Site Selection

- Pick new sites based on strength-- good sites that need to keep spruce (hardwood sites with spruce component)
- Processor cut sites should be either or both
  - abundant adv reg (so that we get a thinning)
  - crappier sites so hardwood doesn't take over
- Should intolerant hardwood/fir sites be candidates for this sort of treatment at all?
- Based on edaphic considerations, site quality, etc, not more fleeting components

Gap Placement/config

- Random GIS points remove human bias
- Gaps set around regen produce better results, we can't mimic nature anyway
- Expansion? Benefit of diffuse light to stimulate adv reg?
- Around patches of biological maturity

Size

- Natural disturbance history (0.006 to 0.03ac), operational range 0.09 to 0.5ac
- Does size really matter if we have the advance regeneration?

Rotation Length

- 50 year in compositions that include aspen/fir components,
- 100--140 years for spruce/tolerant hardwoods

Operational Cutting Cycle

- 10 years
  - Clean gaps often (in areas of high growth potential, clean gaps every10 years as well
  - Hard to get back (often 20 years before we can get back around)
- 20 years
  - Better diffuse light stimulation of advance regeneration at edge of gap (candidates for expansion?)
  - doable return interval

Equipment Mix

- Chainsaw, skidder, forwarder
  - Focused, can clean, reduce area in forwarder trails (3-5%?)
  - Inefficient, hard to find crew, more $
  - Coordination with CTL team may be difficult
- Chainsaw, skidder
  - Focused, can clean gaps, no area in forwarder trails
  - Inefficient, hard to find crew, more $$ (hauling CTL?)
  - Residual stand damage?
- CTL (processor, forwarder)
  - Bigger gaps necessary
  - Harder to save A spruce, more area in trail within-gap
  - Efficient (Clint more efficient in these stands last winter), have crew, less $

Trail Area

- Should trails count as an entry?
  - Only 2-5% in forwarder trails,
  - do skidder trails count (no more Bob Matthews)?
  - Tero—30% of within-gap area in processor trail

Assessment/Inventory

- Gaps pre-exchange of GIS: Horiz. Line sample to determine area in trail (2 types), gap, nongap
- Gap-based assessment of regeneration (store in GIS DB)
- New gaps where we have GIS from harvester: assume trail width 11-12', gaps GPS'd on layout

Percent Area Regenerated

- area to regenerate should be 0.7% to 1.3% per year (over rotation age).
  - Determine cutting cycle, desired rotation, then use about 1% annual disturbance rate (Seymour et al. 2002).
  - Natural gap compounding: 20% harvest + 20% natural gap = 40% gap and only 60% remaining matrix

Retention Protocols

- JBs—organized around large long lived tree
- RMs—specific trees marked (akin to OSR, but on per gap basis. Long lived, large, WL)
- Always pole sized spruce

Context:

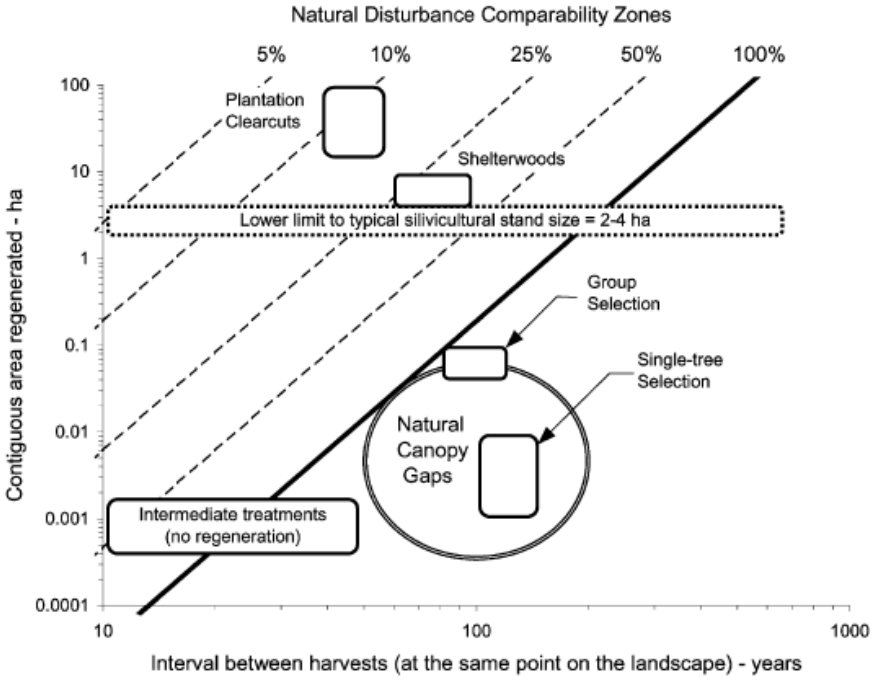
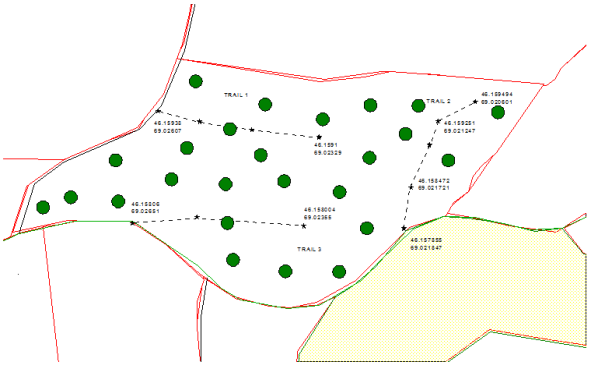
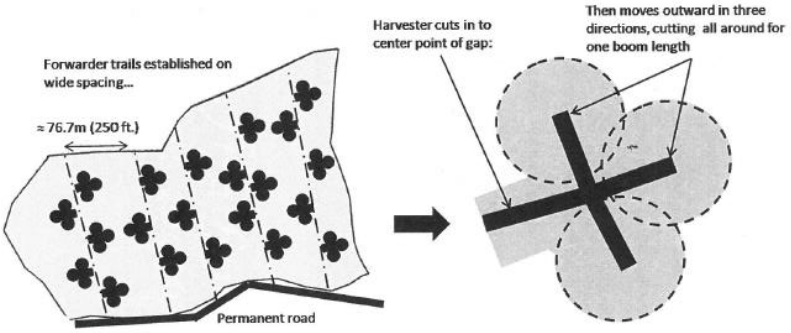


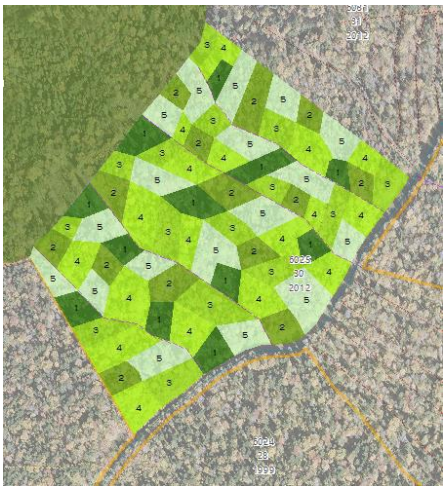
Fig. 3. Natural disturbance comparability zones (defined as in Fig. 2) displayed against typical northeastern silvicultural systems. Note that the upper limit of natural canopy gaps (ca. 0.1 ha) is at least one order of magnitude smaller than the smallest stand size (2 ha).



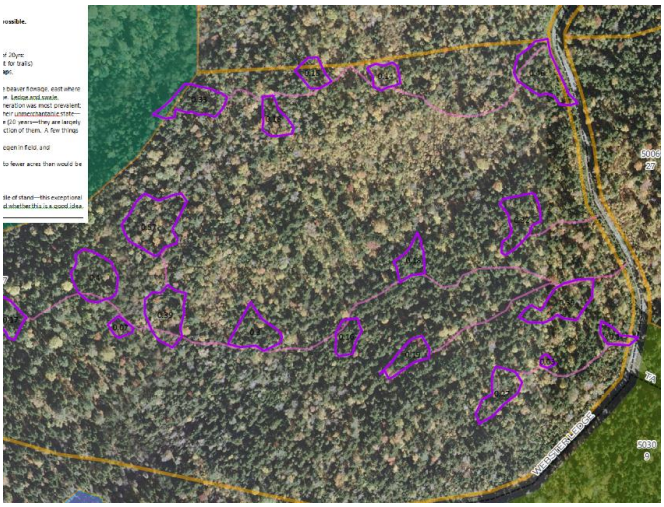
Jensen's random pts



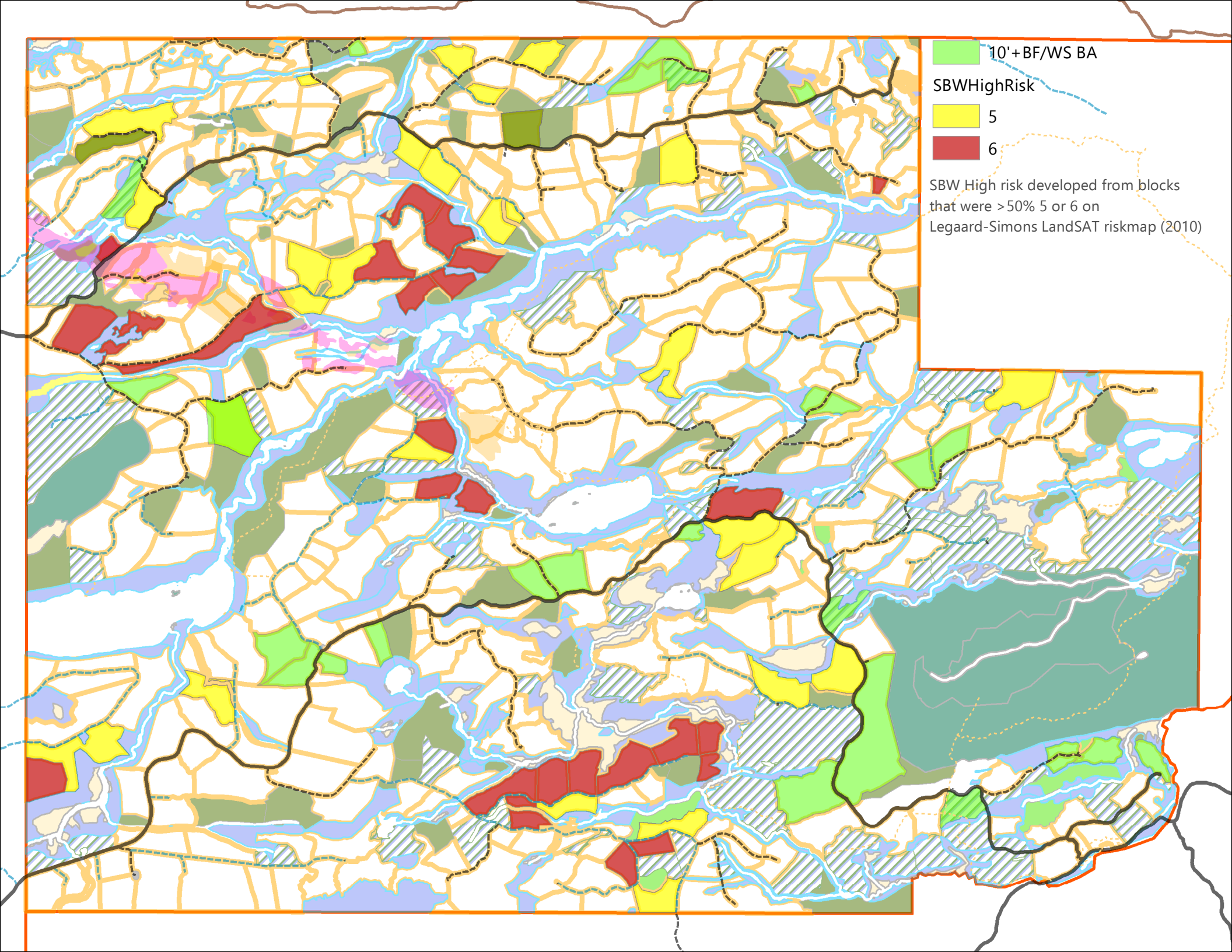
Carol's Clover



Rick's Planned Patchwork



?


10'+BF/WS BA
SBWHighRisk
5
6
SBW High risk developed from blocks that were >50% 5 or 6 on Legaard-Simons LandSAT riskmap (2010)