



University of Idaho

College of Natural Resources

MODELING CENSUS LEVEL INVENTORIES

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CHALLENGES OF CENSUS LEVEL INVENTORIES

What's the central issue?

- We've been using summary tree lists for decades to compile volume and estimate growth
- All of our tools have been built around those data

TRADITIONAL SAMPLED INVENTORIES

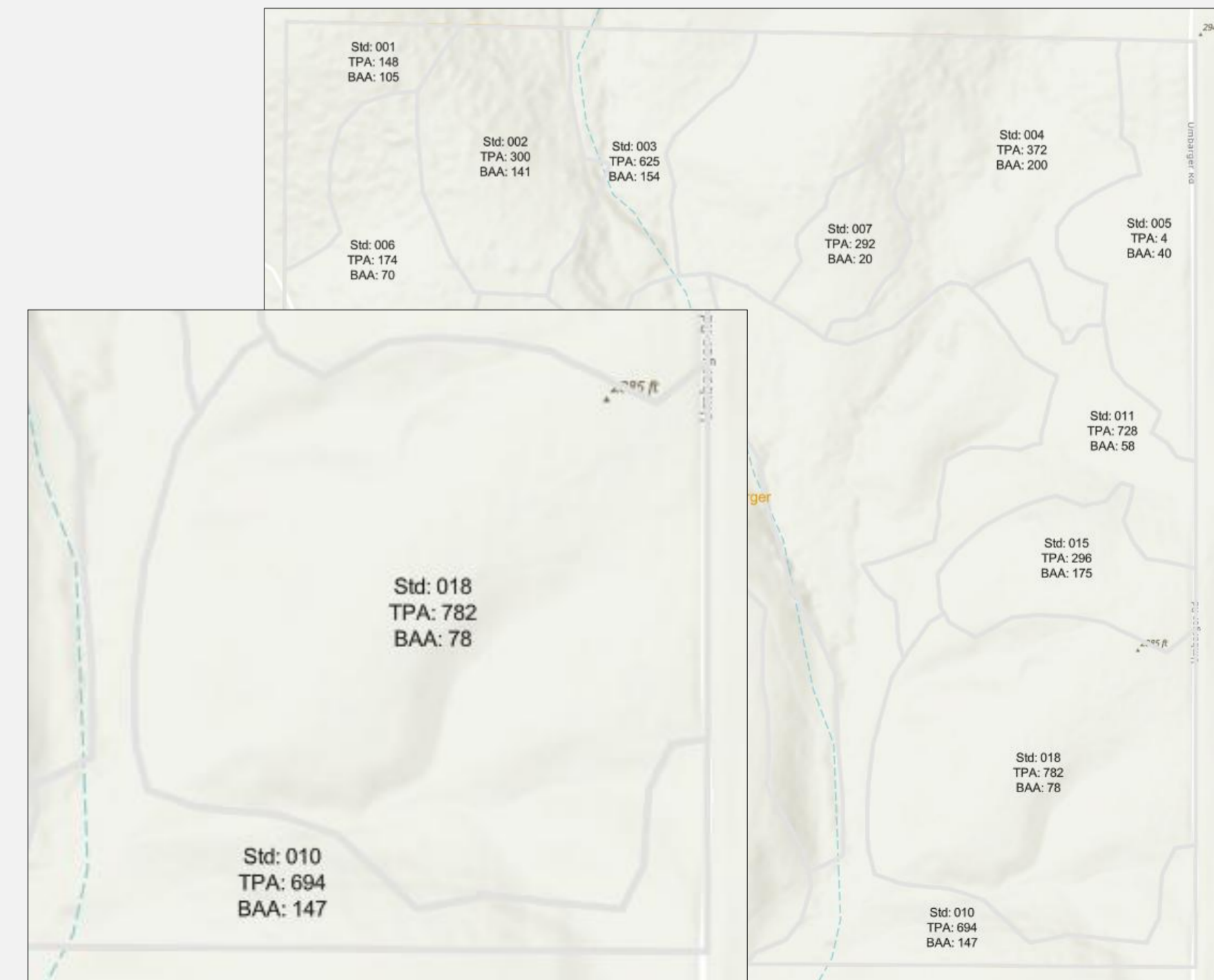
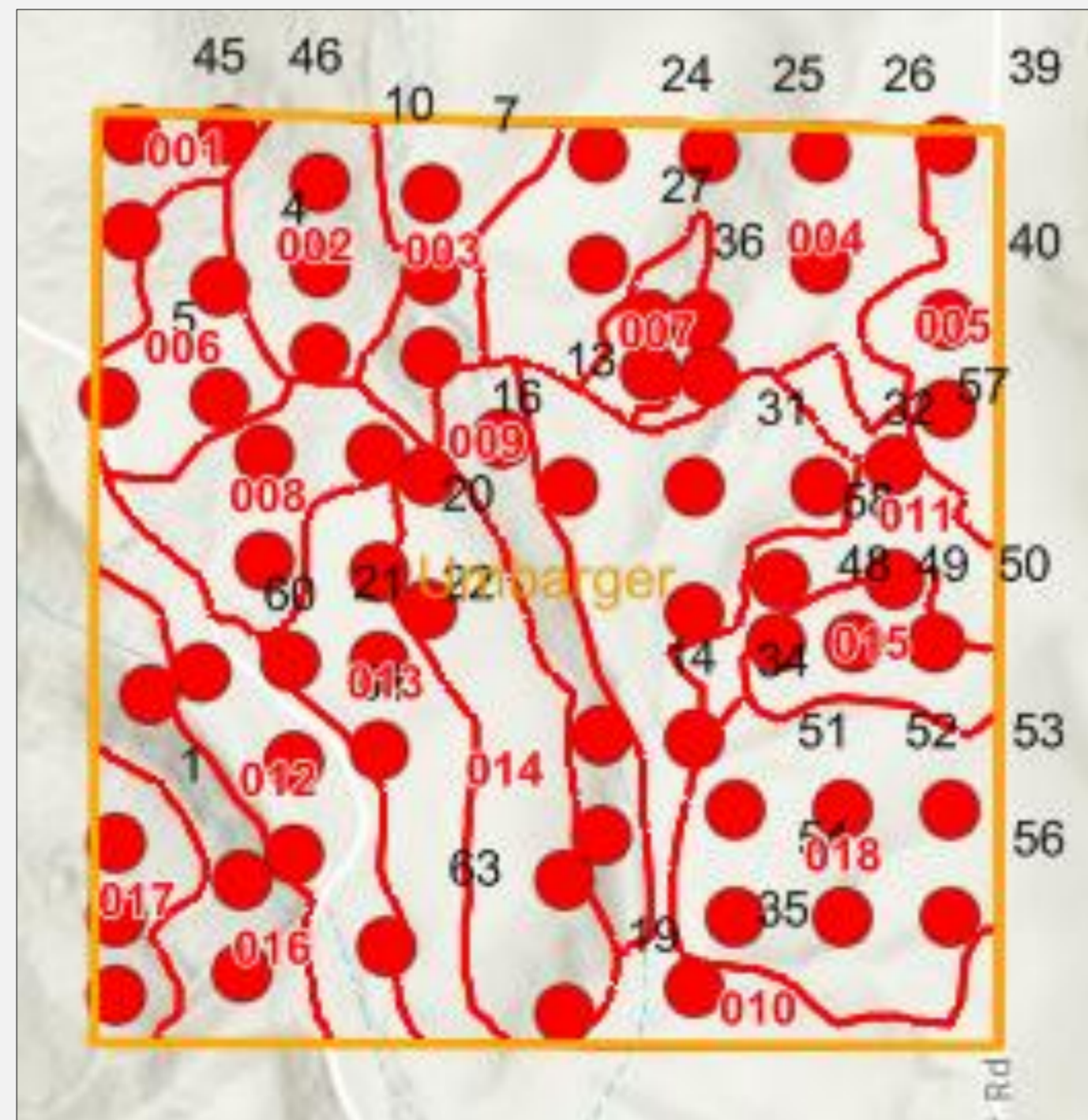
We've done it this way forever

- Yes, it's worked and it's statistically valid (within limits)
- The output has always been summary treelists
- Growth models were built to support these summary data
- But it's not been a problem until now right?
- Well not really, FVS capacity limits have been an issue for 25 years

VISUALIZING THE PROBLEM

What do the data show?

Cruise Example



VISUALIZING THE PROBLEM

Magnitude of the difference

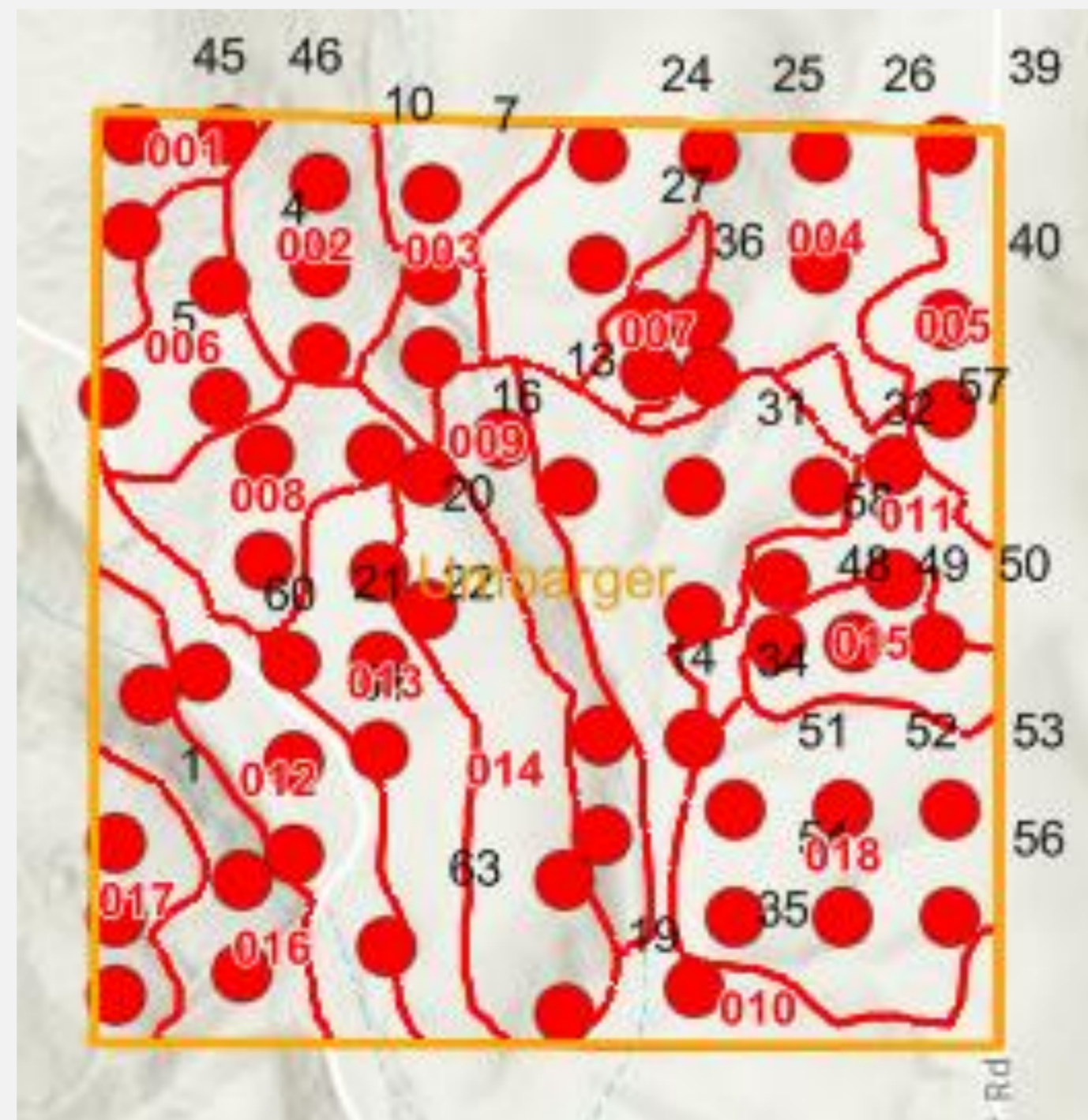
- Example:
 - 75 ac stand (Inland West)
 - 22 plots – 202 cruised trees
 - 52 record treelist
(std,spp,dbh,status)
 - Just over 1,000 TPA
 - +/- 75,000 trees
represented by 52 records
- Generalized difference
 - Cruised Trees: 0.3%
 - Tree Records: 0.07%

That's how many records we've been using to compile volume and forecast growth.

VISUALIZING THE PROBLEM

What do the data show?

Cruise Example



Census Example



TRADITIONAL SAMPLED INVENTORIES

We've done it this way forever

- Yes, it's worked and it's statistically valid within limits
- Why were these data used?

Growth models were built to use this type of data

- But it's not been a problem until now... well not really...
- FVS capacity limit problems have been an issue since the late 1990's.

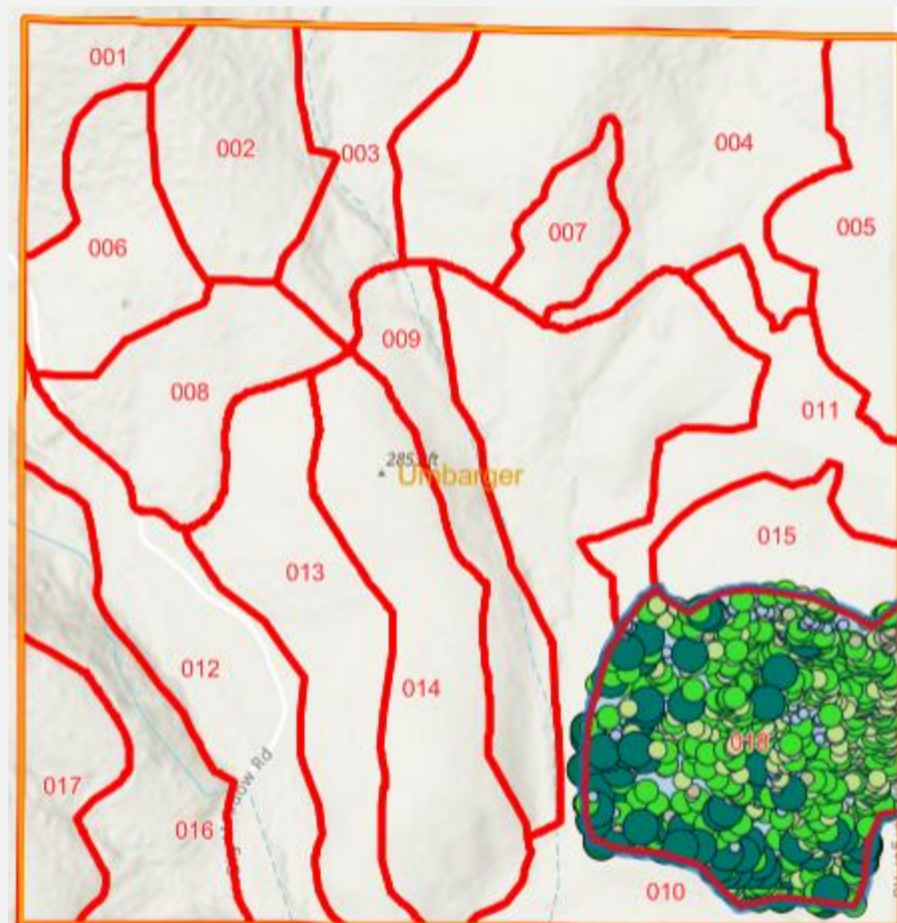
POTENTIAL SOLUTIONS

Examining the range of possibilities

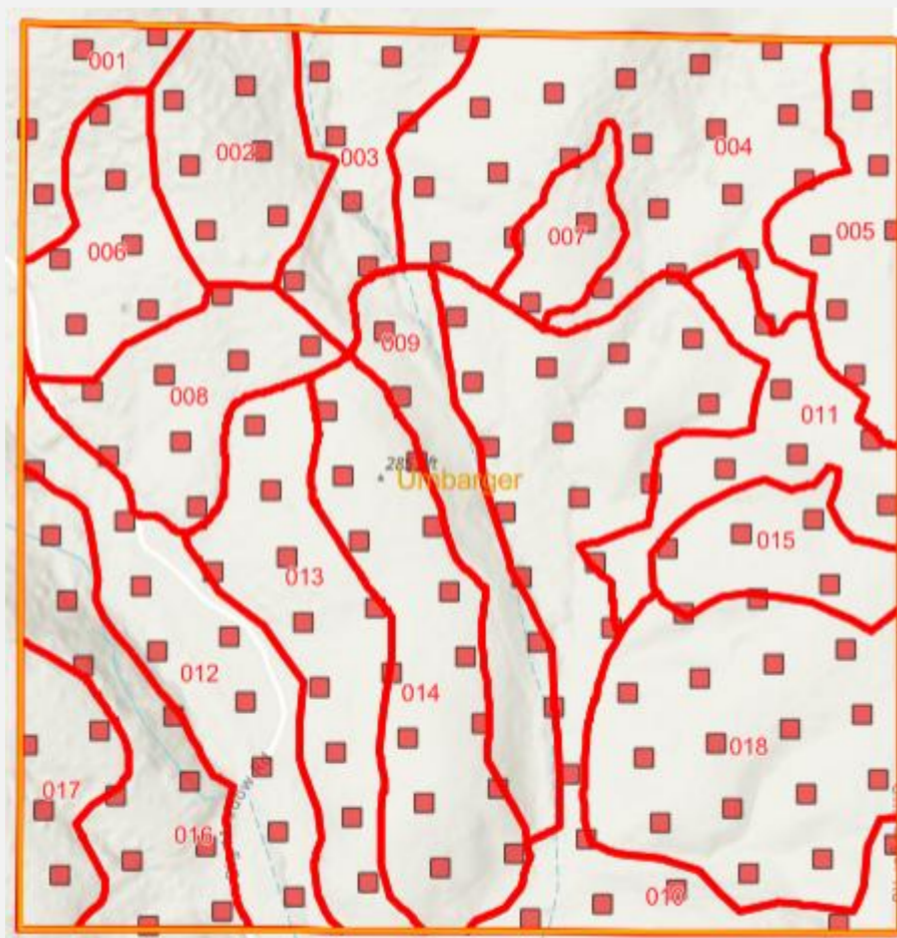
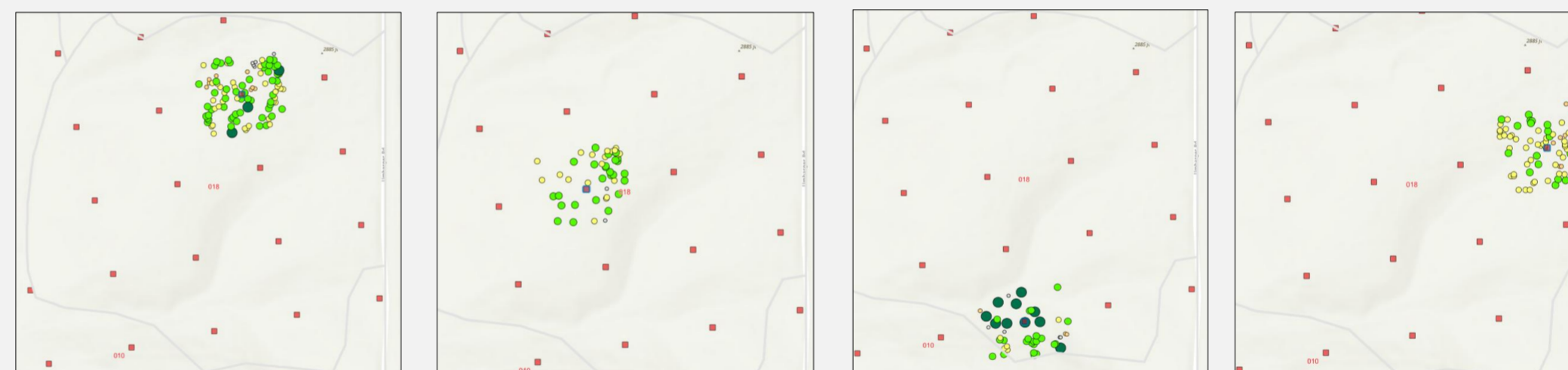
1. Adapt the growth model to allow more records
 - Requires technical skills or \$ to pay for contract help
 - USFS has other higher priorities, but they are investigating
 - + Proven solution (FVS,FPS)
2. Summarize the census population to a simplified treelist
 - Requires significant additional work and is complex to implement
 - Generally, not handled by the growth model
 - + Proven solution & has been done at scale
3. Break the problem down into smaller pieces...

Census Inventory Example

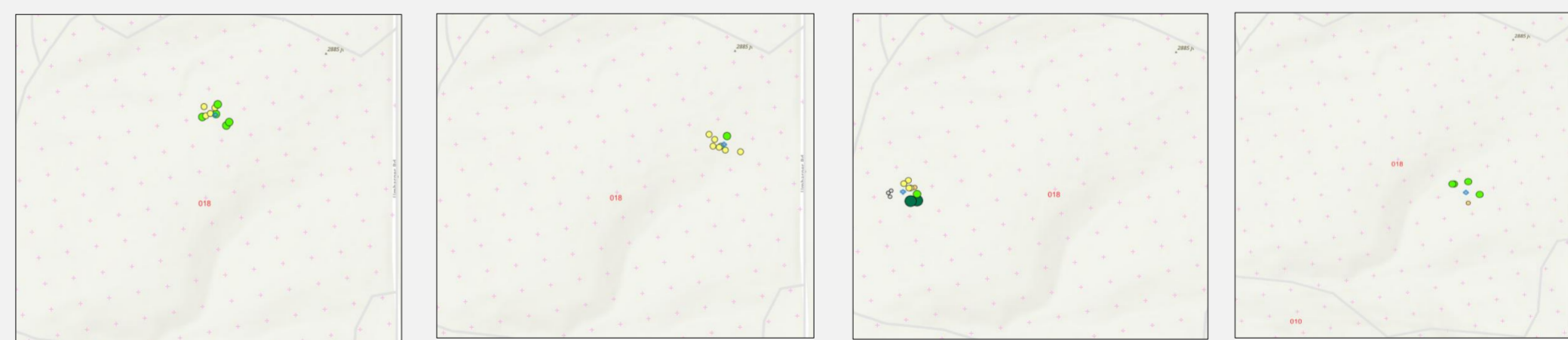
EXAMPLE



1-Acre Grid (64m)



1/10th-Acre Grid (20m)



TAKE HOME MESSAGES

What's important

- Census level population estimates really simplify the problem in the end
- These inventories reduce the population down to single individual observations that match reality
- It often takes a long time for foresters to come to recognize this
- The trade-off is size for simplicity
- So our problem isn't so much the growth models, it's how we process and store the data and how we run the models
- There are viable solutions that work with the existing models



WHAT'S UI WORKING ON?

Through our Forest Innovations Institute & Affiliates

- We are developing a series of demonstration tools
 - Data design and engineering
 - Analytical templates
 - Fully functional digital twins
 - Opportunity to talk about project goals and jump start development
 - Set realistic goals and timeframes



MORE INFORMATION

CONTACT

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