SILVICULTURE FOR SPOTTED OWLS IN DRY FORESTS: SUPPORT FOR PLANNING

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SUMMARIZE RESEARCH INFORMATION FROM WA, OR & CA:

1. NEED FOR MGMT
2. WHAT THINGS MATTER TO OWLS
3. PLANNING TOOL

Dry Forests in WA

More owls in At-risk Forests

Class	Regime	% (NO.)
Class 1	Within HRV	20 (54)
Class 2	Moderately altered from HRV	36 (100)
Class 3	Significantly Altered	44 (120)

MOST PRODUCTIVE SITES AT-RISK

FOREST TYPE	No. Owl Sites	Fires/10,000 Ac/Decade	No.yng/ year
P.Pine/fir	26	10.0	.63
D. fir/Pine	22	7.4	.62
Grand Fir	62	4.6	.54
Grand Fir	19	4.4	.36
Hemlock/ Subalpine	15	3.0	.14

ACTIVE MANAGEMENT NEEDED TO SUSTAIN OWL HABITAT—BUT WHAT & HOW?

FUEL BREAKS OR REDUCTIONS COULD
HAVE NEGATIVE CONSEQUENCES
(E.G., FUNGAL/PREY)

THINNING CAN INCREASE FIRE HAZARD.

13-YEAR WNF PROJECT, 170 OWL SITES →

WHAT MATTERS TO OWLS

RIPARIAN ZONES (High-rent districts)

LTAs w/DEEP SOILS (site index, prey)

30-70% CANOPY COVER

BIG TREES (- EXC. @ NESTS, D-FIR)

~50% DRY FORESTS W/PAST P.H's

5-8" TREES (-) EFFECT (BAOW)

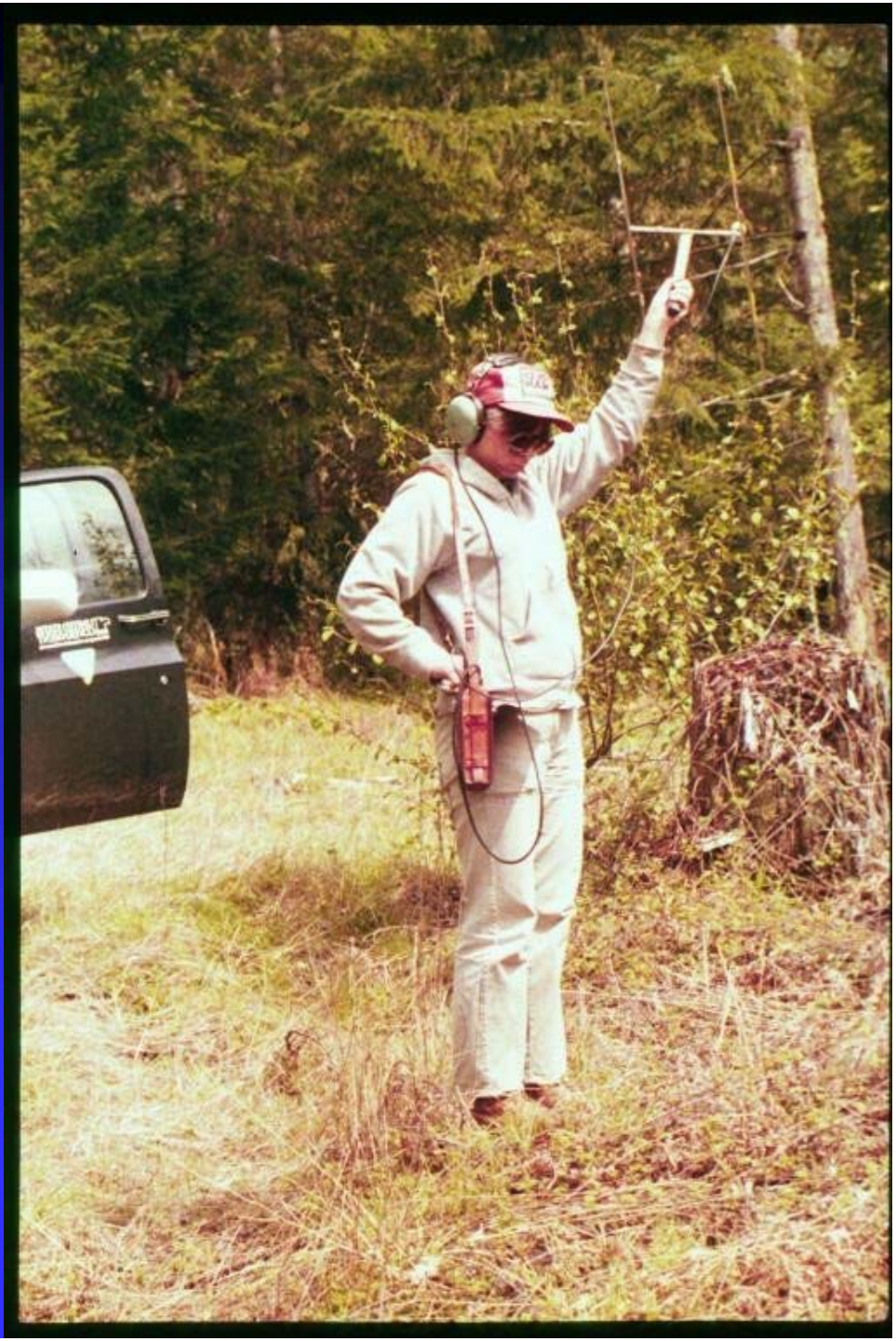
FORESTS CAN BE TOO DENSE AS
WELL AS TOO OPEN → THINNING OR
SELECTIVE HARVESTS MAY HELP

Telemetry Studies in OR & CA

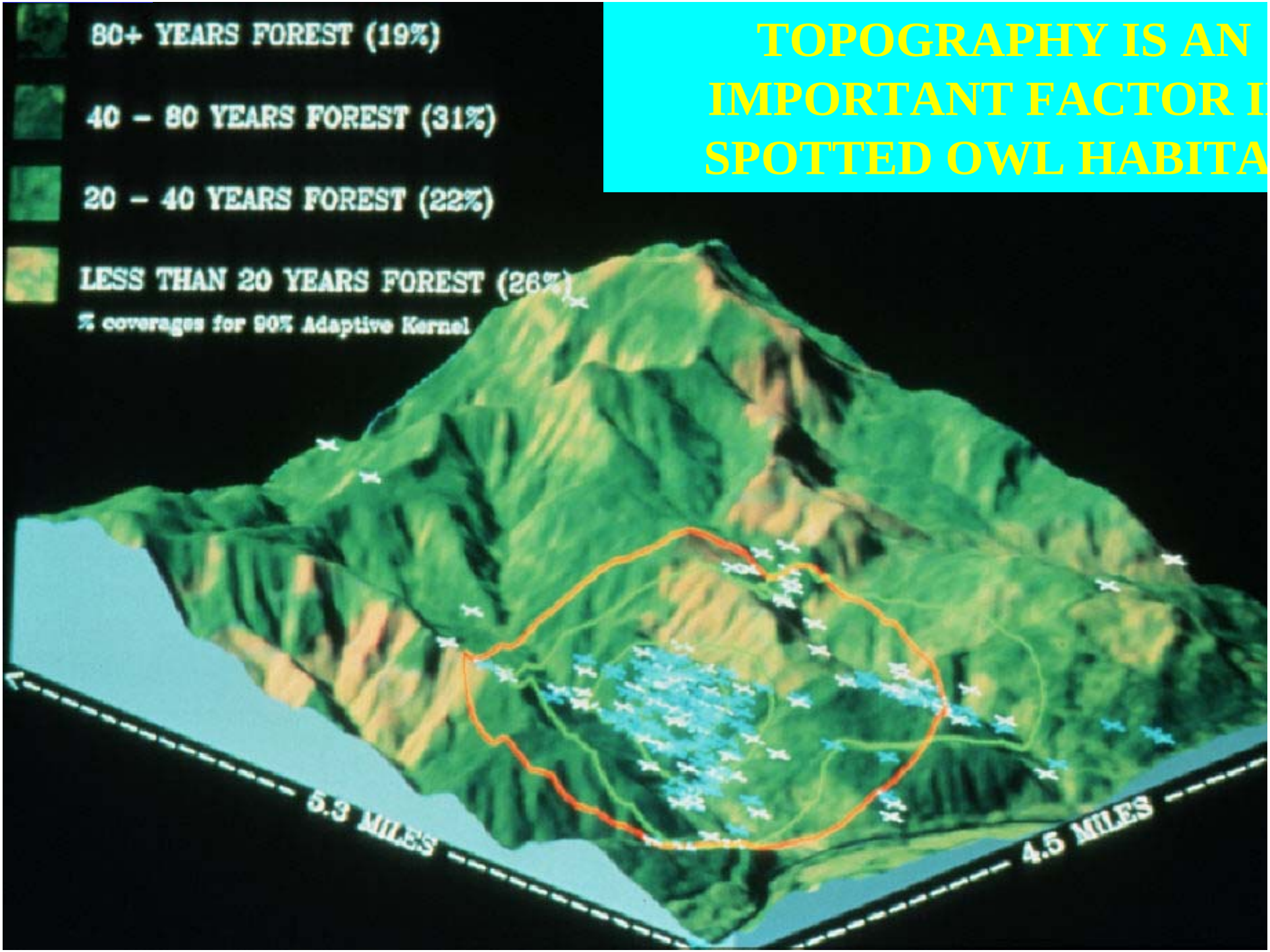
> 275 owls tracked

More than 35,000 telemetry locations

9 study areas

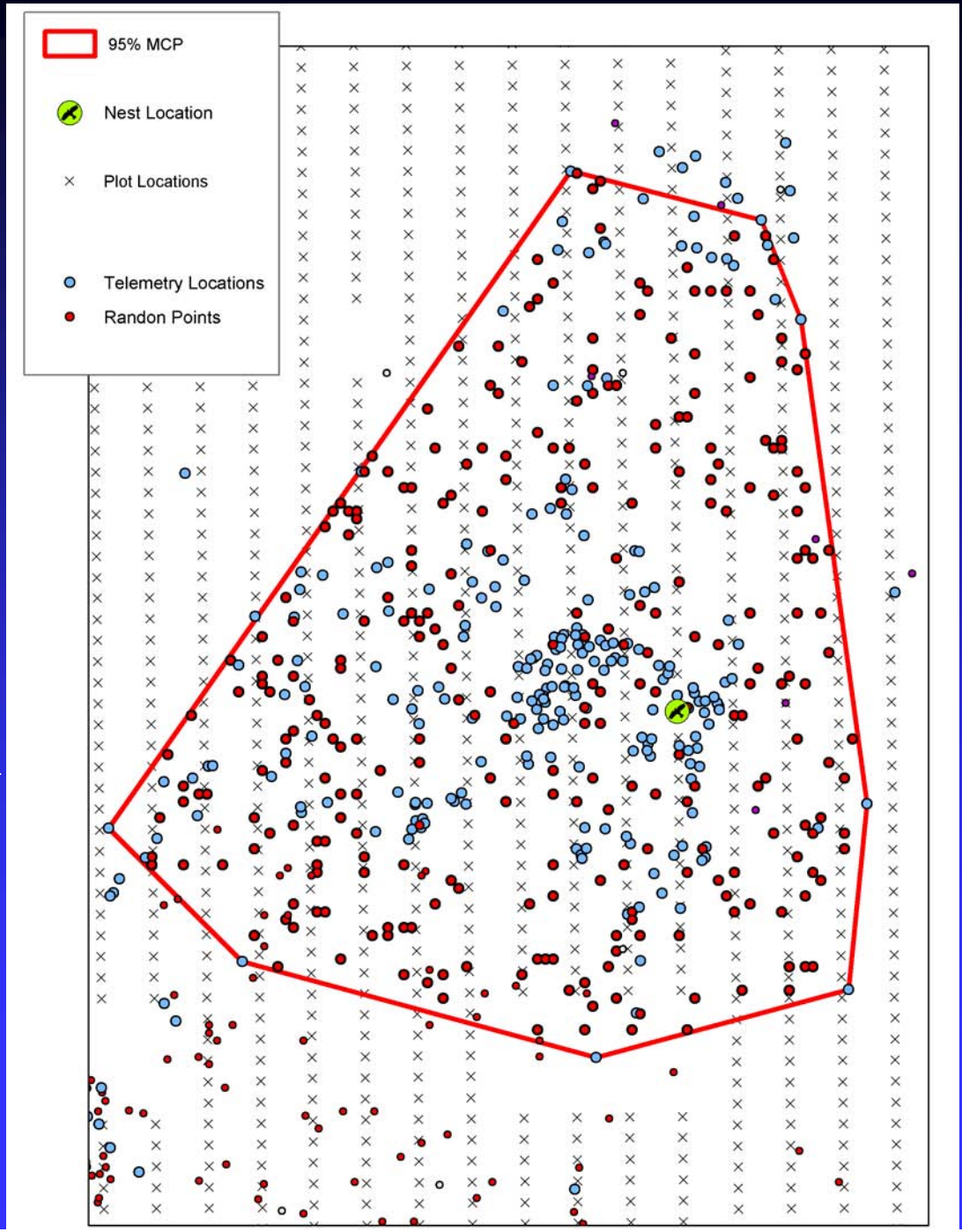


TOPOGRAPHY IS AN IMPORTANT FACTOR I SPOTTED OWL HABITA



Use vs. Availability Study

Used Inventory Data



THINS & P.C.s DON'T CHANGE SERAL STAGE CLASS.

MEASURES OF STAND DENSITY, COMPOSITION, AND SIZE-CLASS ARE REQUIRED

STAND INVENTORY DATA → LINK W/FORESTER'S TOOLS

(e.g., GROWTH MODELS, FIRE-RISK)

“THE BEST JUDGE OF OWL HABITAT IS..
A SPOTTED OWL”…

POSSIBLE Rx --500-acre analysis area (AA)

EMPHASIZE RMZ (productivity; vs ridges)

THIN FROM BELOW (but w/heterogeneity!)

DWD: 1 or 2 logs/acre [66’ x 2’] (or slash pile)

SNAGS (> 16” DBH): ~ 2/ac (+/-)

40-50% AA w/150-225 sq. ft/ac (~40-70% CC)

< 20% AA with > 225 sq. ft/ac

< 20% AA with < 60 sq ft/ac (ridges)

REMAINDER OF AA: 60-150 sq. ft/ac

COMPOSITION MATTERS!
PINE < WHITE FIR < HARDWOODS
& DOUG-FIR (Mistletoe, etc.)

MAINTAIN HARDWOODS IN UNDERSTORY
MAST-PRODUCERS (?)
TOSS SPHERICAL DENSIOMETERS!

LIMITED EXPERIENCE: INITIAL RESPONSES TO SILVICULTURE

THAT LEFT AVE. 120 SQ. FT/AC:

1. Owls didn't leave
2. Home range & frequent-use areas didn't change
3. Used treated areas before & after thinning
4. Use seemed to increase along edges

BEYOND STANDS: PREDICT OWL RESPONSE TO FUEL REDUX & RE-GROWTH OVER SHORT- & LONG RUNS & LARGE SCALES

HABITAT ASSESSMENT & PLANNING TOOL TO HELP INTEGRATE OWL AND SILVICULTURAL GOALS

DISCRETE-CHOICE RSF

APPLIES TELEM & INVENTORY DATA w/in HOME RANGE AT POPULATION LEVEL

FACTORS EXAMINED

ABIOTIC ENVIRONMENT

TOPOGRAPHY (Water), ELEVATION,

ROADS, NEST DISTANCE, SLOPE, ASPECT

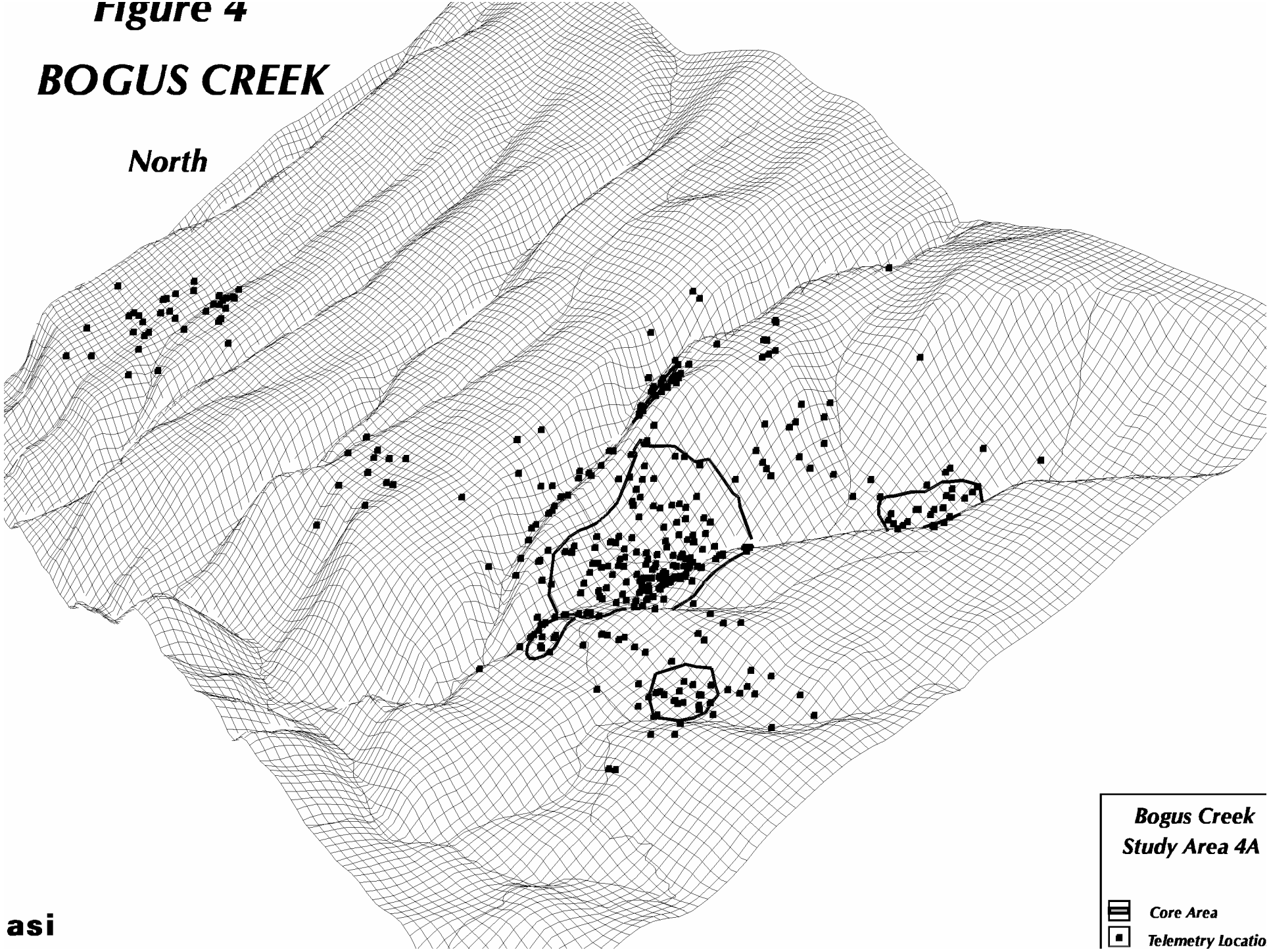
VEGETATION

TPA, BASAL AREA, CANOPY COVER,

QMD, TPA X SIZE CLASS, SPP. COMP.

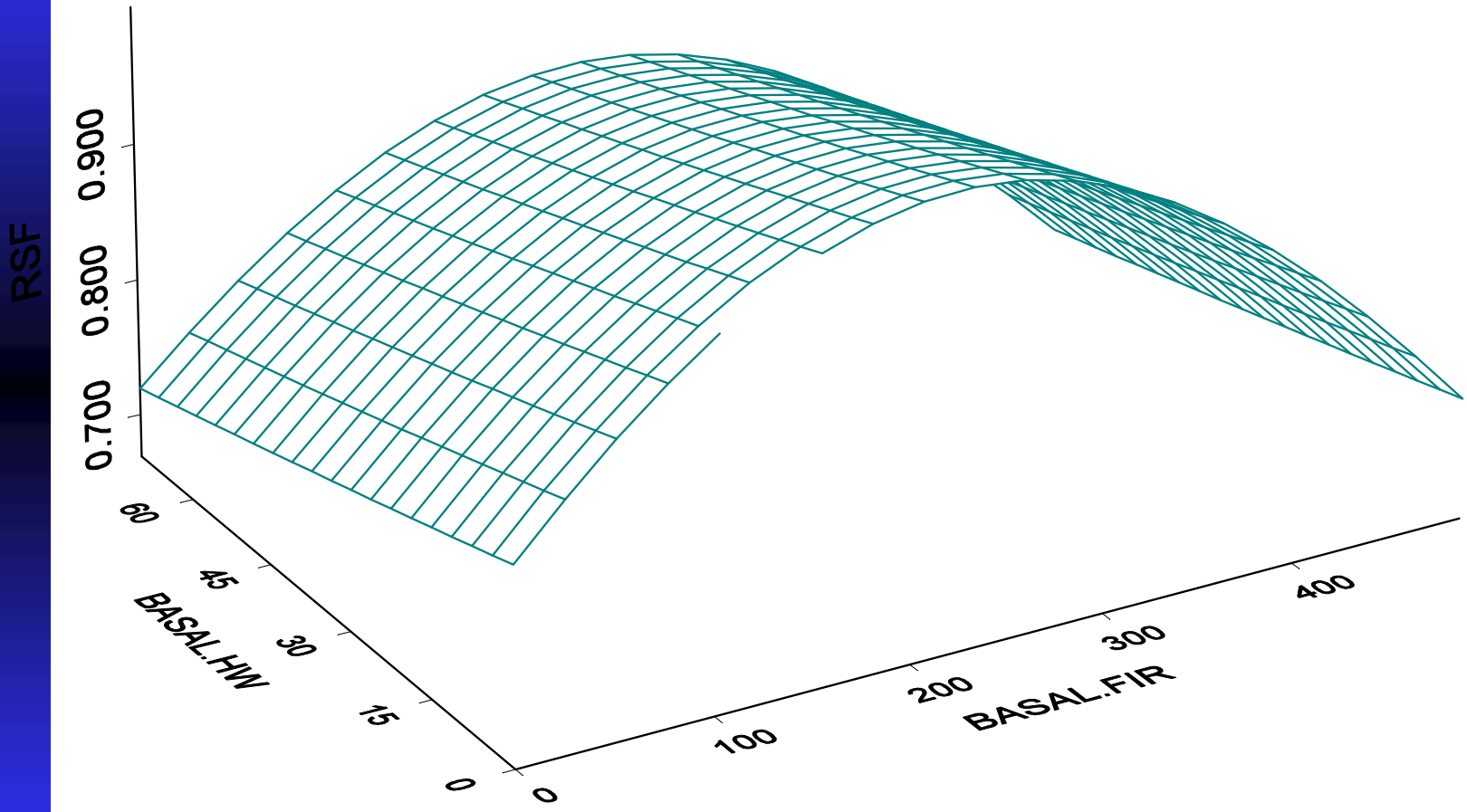
Figure 4

BOGUS CREEK

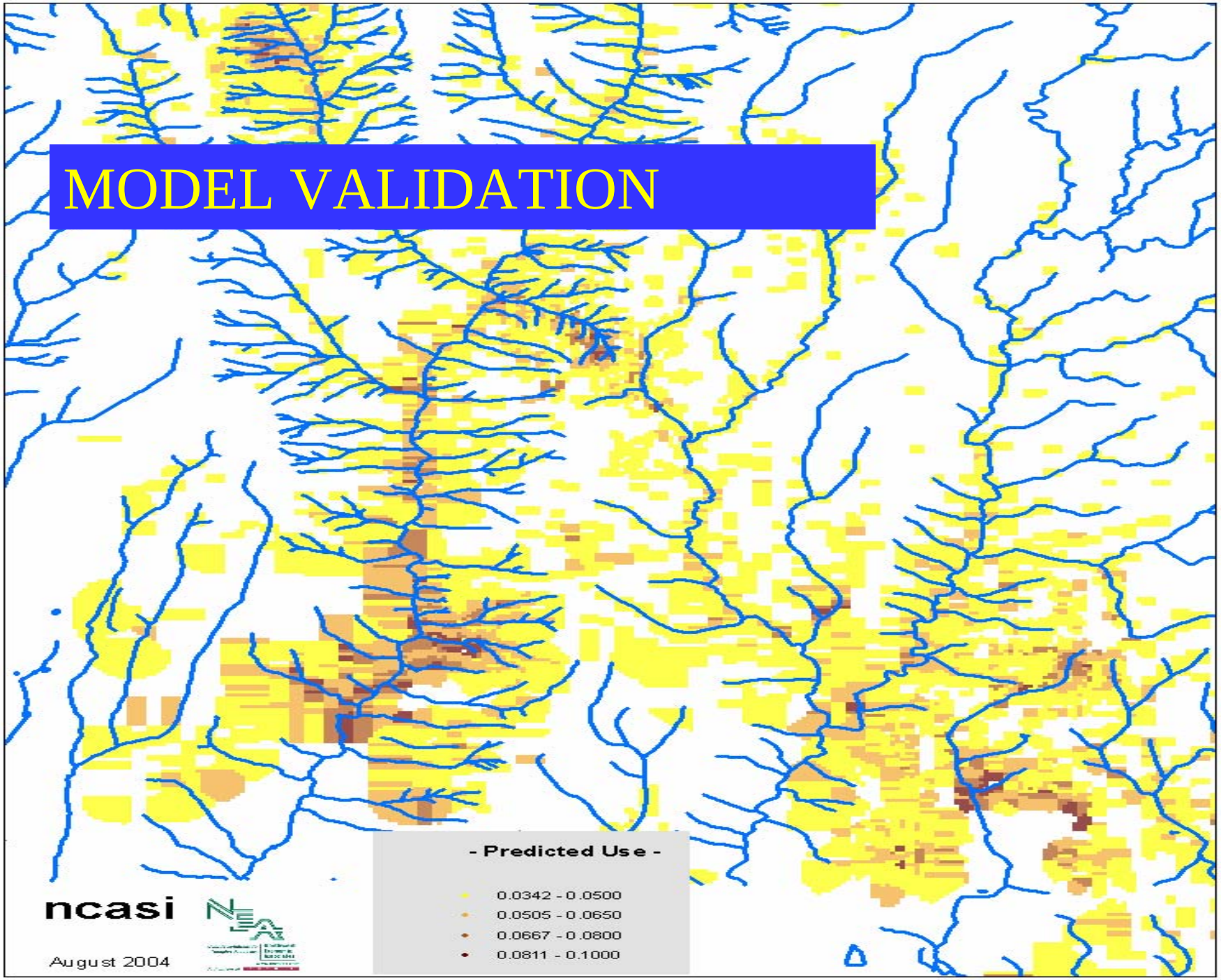


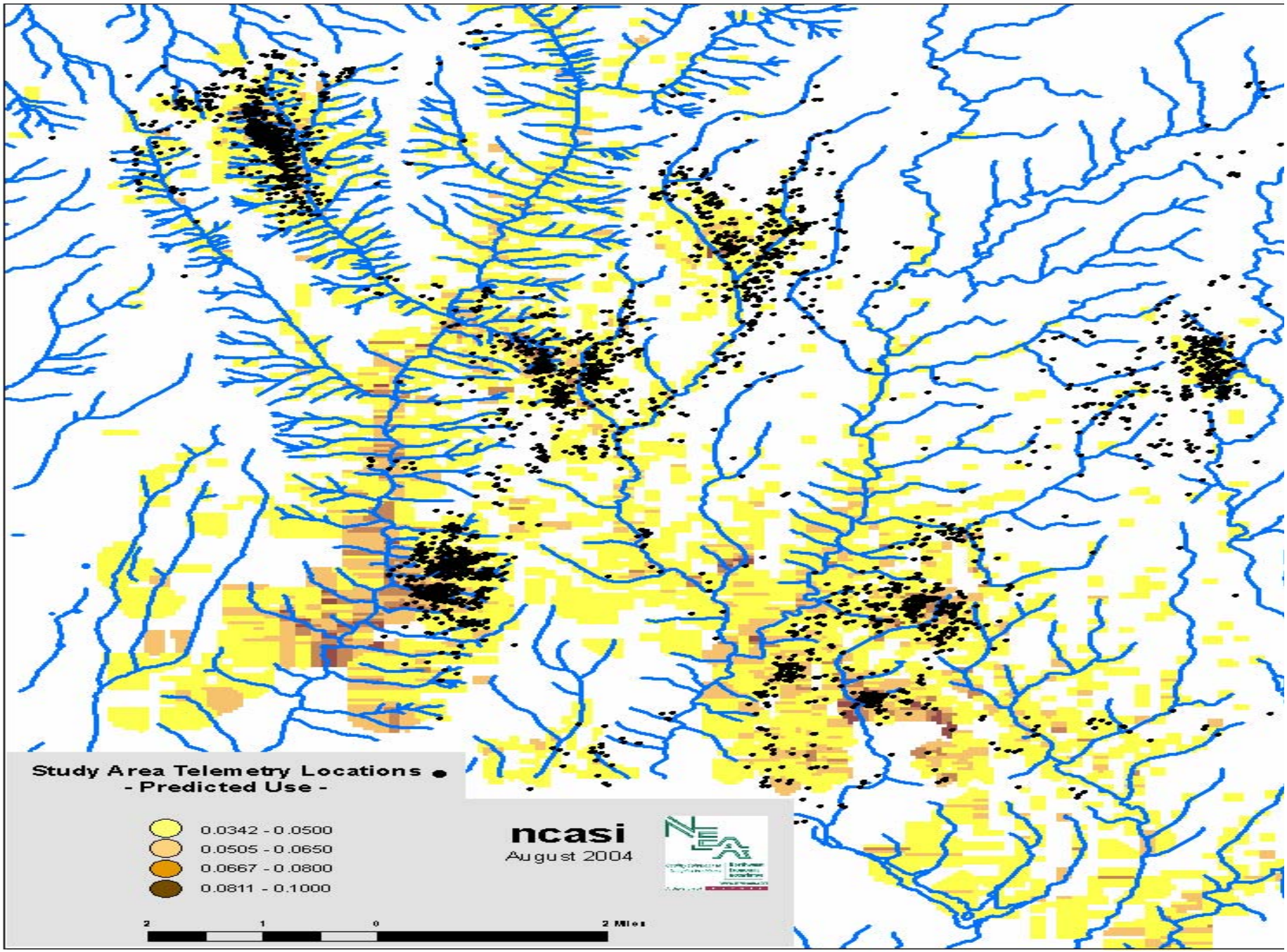
asi

Owl Response to Fir and Hardwood Basal Area



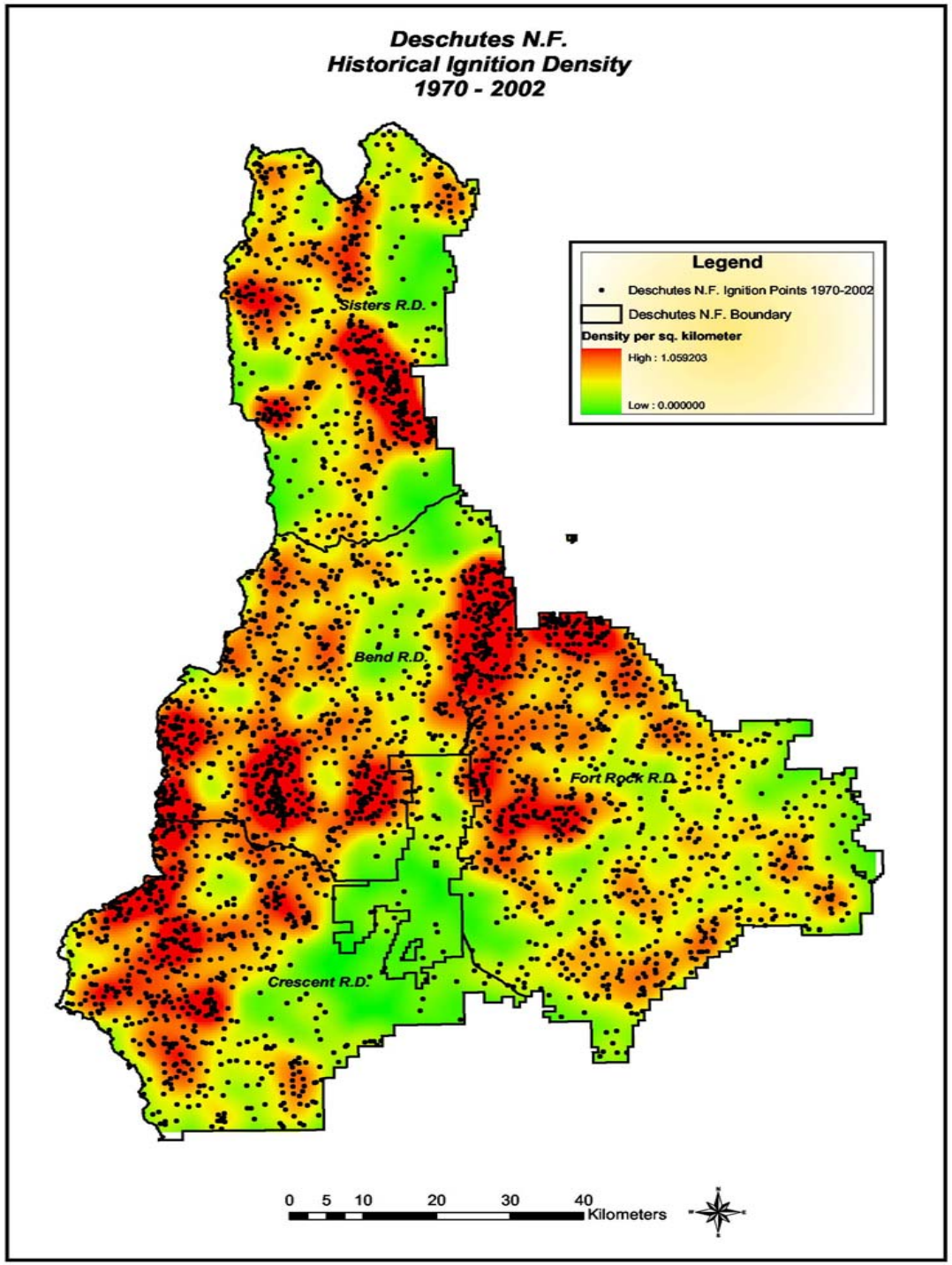
MODEL VALIDATION



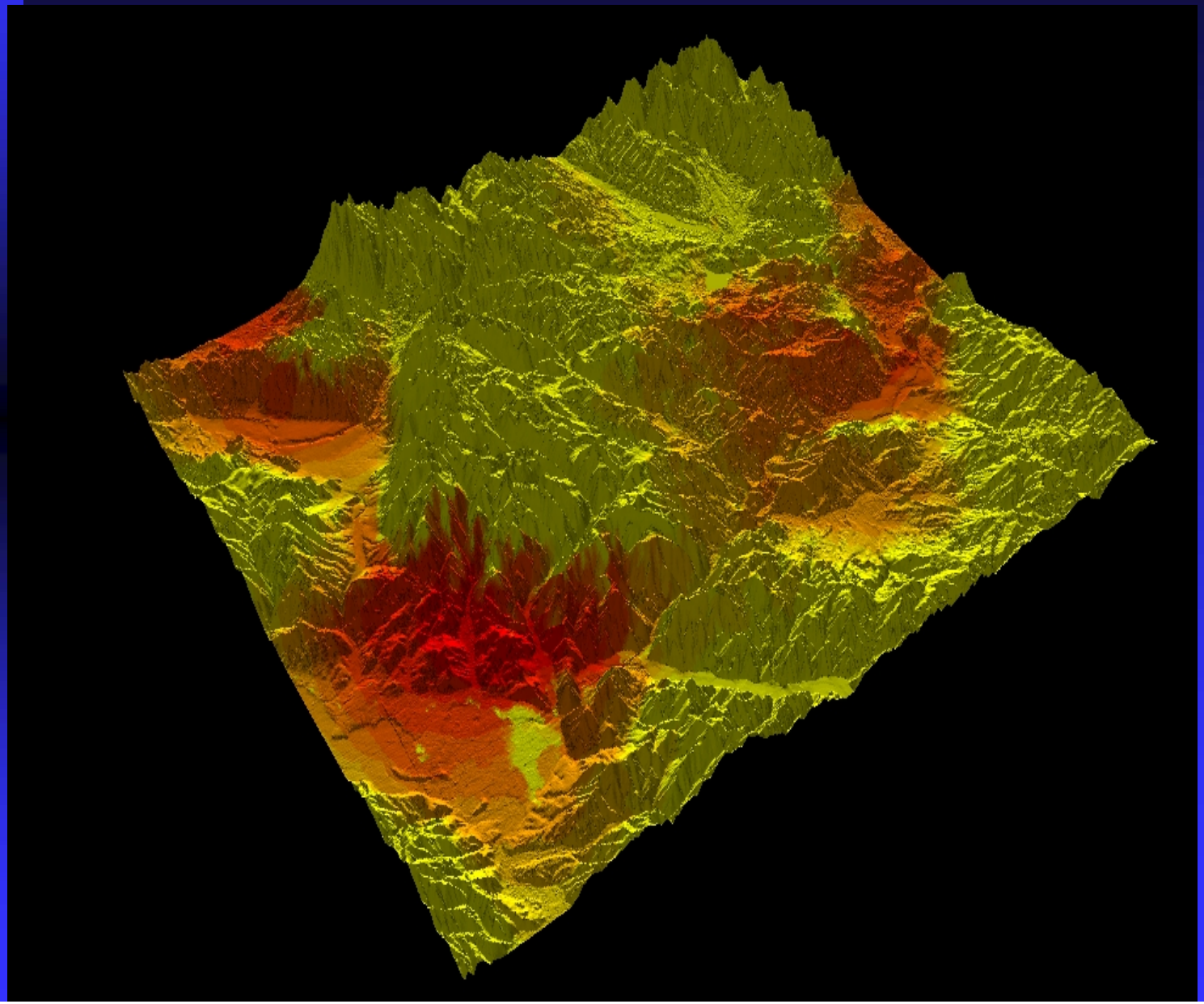

Study Area Telemetry Locations
- Predicted Use -
0.0342 - 0.0500
0.0505 - 0.0650
0.0667 - 0.0800
0.0811 - 0.1000
ncasi
August 2004
2
1
0
2 Miles

APPLICATION STEPS:

1. Map historic fire occurrence



2. Predict pattern of fire spread



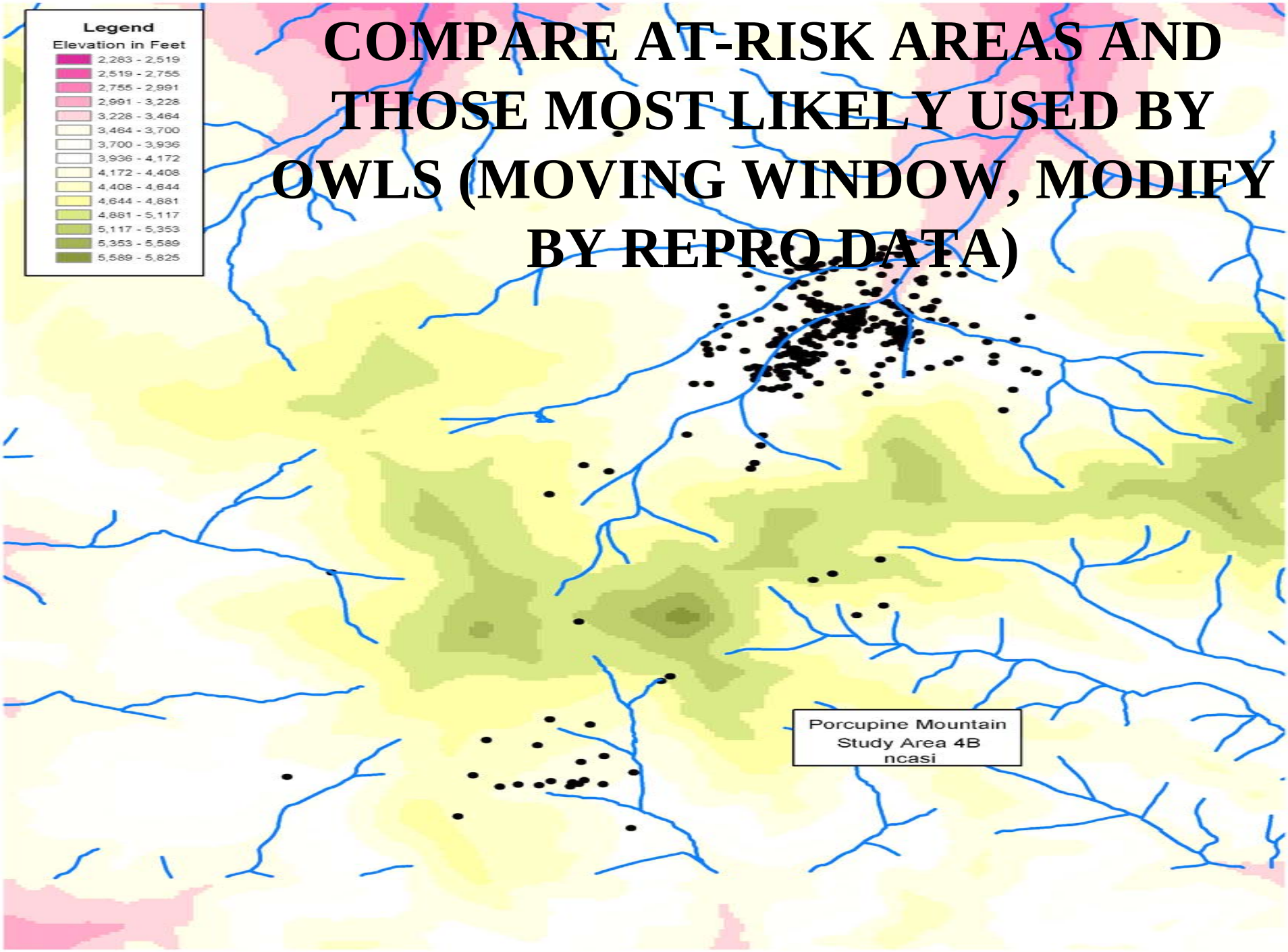
3. **APPLY RSF TO INVENTORY IN A GIS:**

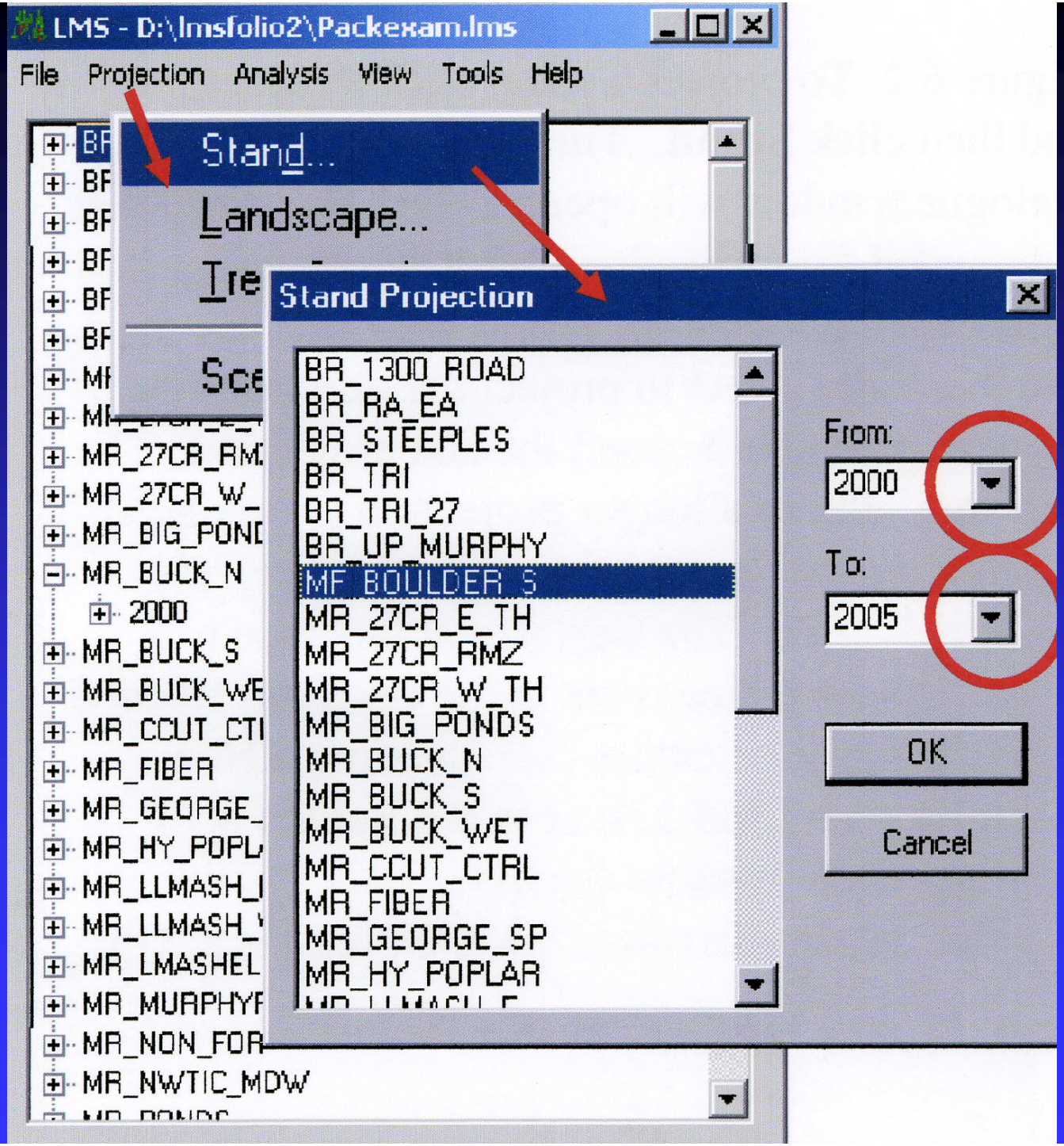
RSF = EXP(DNEST+DH20+BA(FIRS)

- BA(PINE) + HDWOOD)

→ ESTIMATE AVERAGE (& SD) REL. PROBABILITY FOR A.A.

COMPARE AT-RISK AREAS AND THOSE MOST LIKELY USED BY OWLS (MOVING WINDOW, MODIFY BY REPRO DATA)




LMS - D:\lmsfolio2\Packexam.lms
File
Projection
Analysis
View
Tools
Help
Stand...
Landscape...
Stand Projection
BR_1300_ROAD
BR_RA_EA
BR_STEEPLES
BR_TRI
BR_TRI_27
BR_UP_MURPHY
MF_BOULDER_S
MR_27CR_E_TH
MR_27CR_RMZ
MR_27CR_W_TH
MR_BIG_PONDS
MR_BUCK_N
MR_BUCK_S
MR_BUCK_WET
MR_CCUT_CTRL
MR_FIBER
MR_GEORGE_SP
MR_HY_POPLAR
From:
2000
To:
2005
OK
Cancel
MR_27CR_RM
MR_27CR_W_
MR_BIG_POND
MR_BUCK_N
2000
MR_BUCK_S
MR_BUCK_WE
MR_CCUT_CTI
MR_FIBER
MR_GEORGE_
MR_HY_POPL
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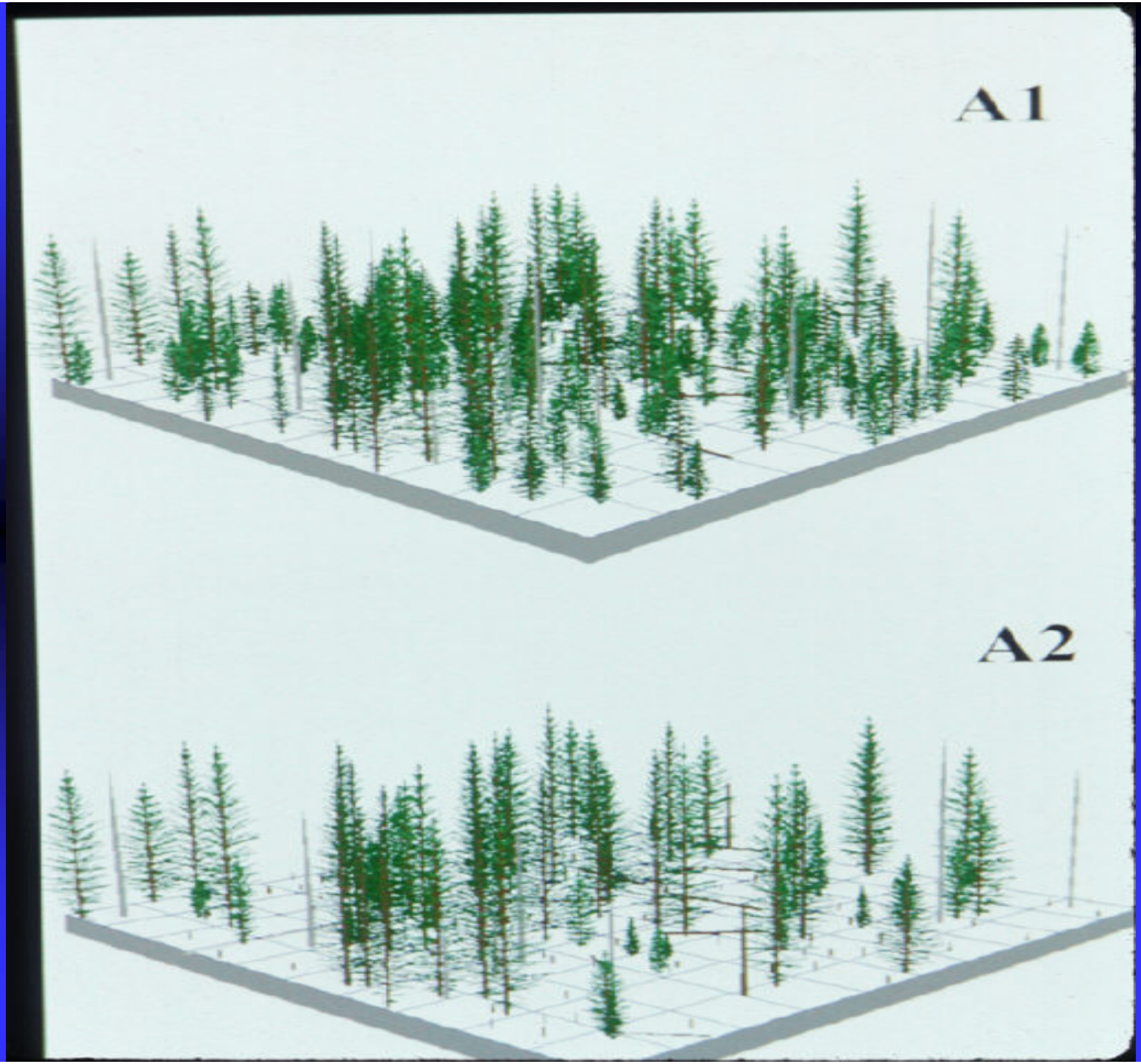
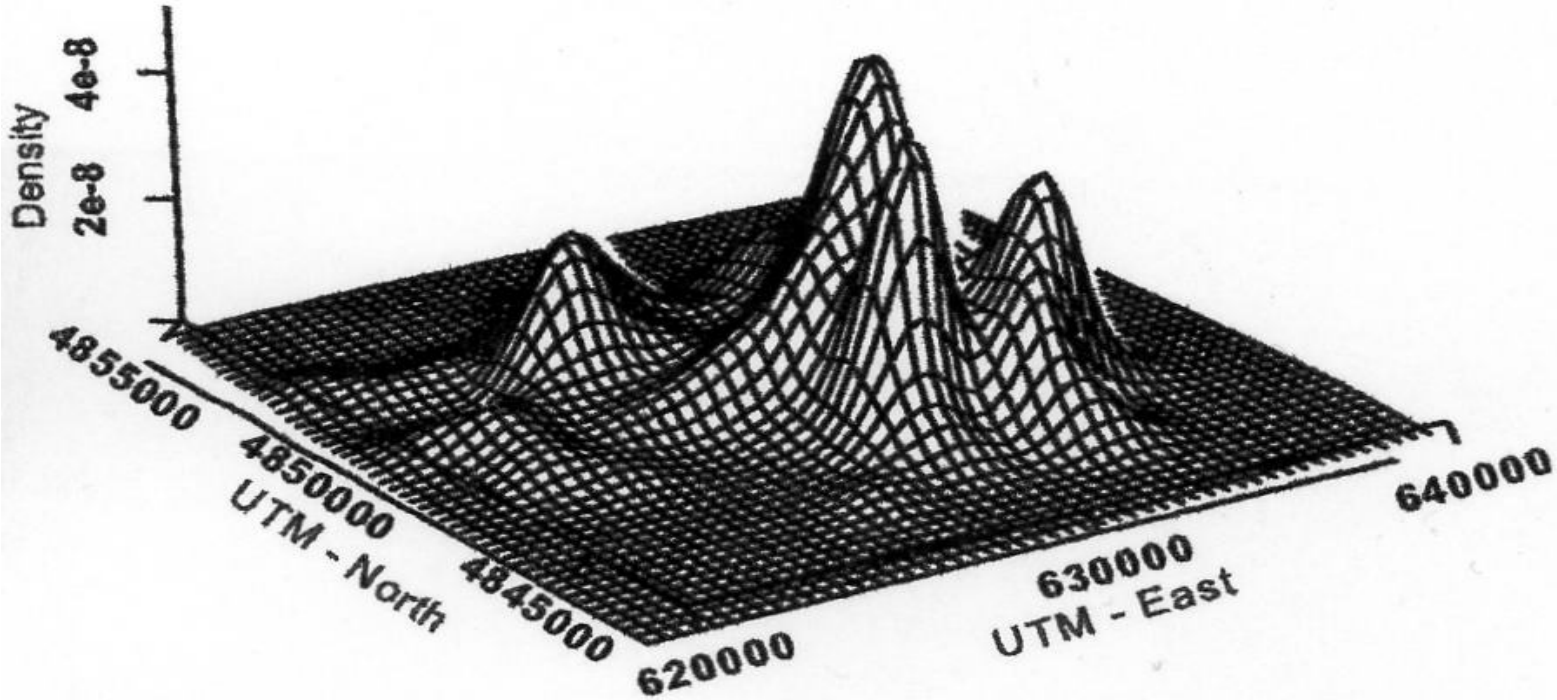
MR_LMASHEL
MR_MURPHYF
MR_NON_FOR
MR_NWTIC_MDW


A1
A2

“GROW” FOREST & RE-APPLY RSF
(10-YEAR TIME-STEP?)

AVERAGE REL. PROBABILITY UNDER SURFACE → ESTIMATE OF EFFECT AT EACH STEP



POTENTIAL USE OF MODELS

- 1. EFFECTS OF CHANGING TREE DENSITY & COMPOSITION BY SIZE CLASS
- 2. EFFECTS OF FOREST GROWTH
- 3. RELATIVE EFFECTS OF SILVIC. ALTERNATIVE S

SUMMARY

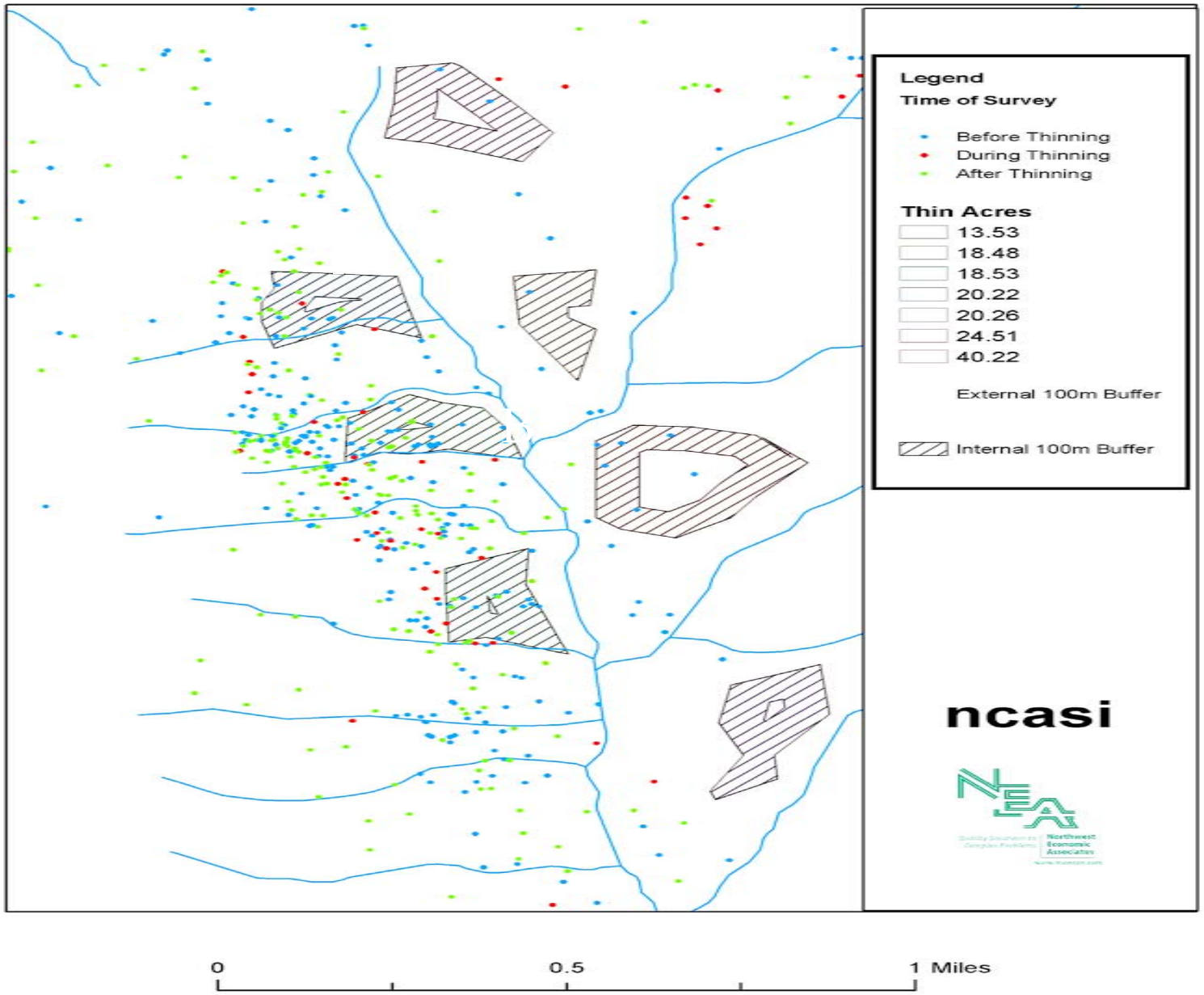
- MULTI-FACTORIAL PROBLEM (non-linearity)
- STRUCTURAL DETAILS MATTER (i.e., inventory)
- SPECIES COMPOSITION MATTERS (economics?)
- LOCATION MATTERS→ incomplete "shifting mosaic"
- HETEROGENEITY MATTERS
- RSF MODELS → IMPROVED ASSESSMENTS

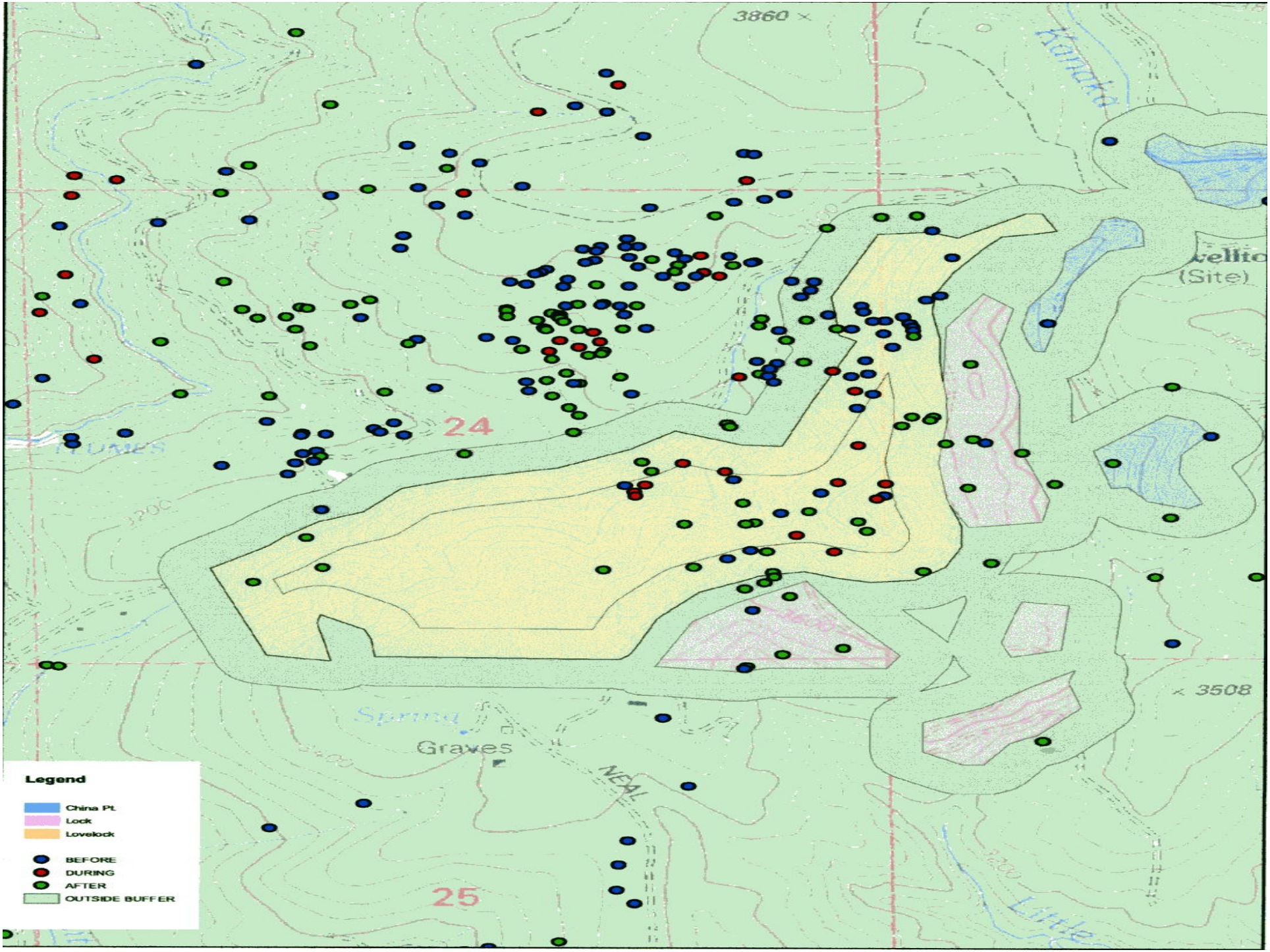
BAOW – NSO Interactions:

Possible Role for Silviculture In Dry Forests?

FUTURE: “MANAGED” FIRE STARTS + SILVICULTURE ????

STOP


Legend
Time of Survey
Before Thinning
During Thinning
After Thinning
Thin Acres
13.53
18.48
18.53
20.22
20.26
24.51
40.22
External 100m Buffer
Internal 100m Buffer
ncasi
0
0.5
1 Miles


3860
Kanaka
(Site)
24
3200
3600
3508
Spring
Graves
NEAL
25
Little
Legend
China Pt.
Lock
Lovelock
BEFORE
DURING
AFTER
OUTSIDE BUFFER