

# The Size and Structure of Eastern Paleoindian Social Groupings: What We Do and Do Not Know

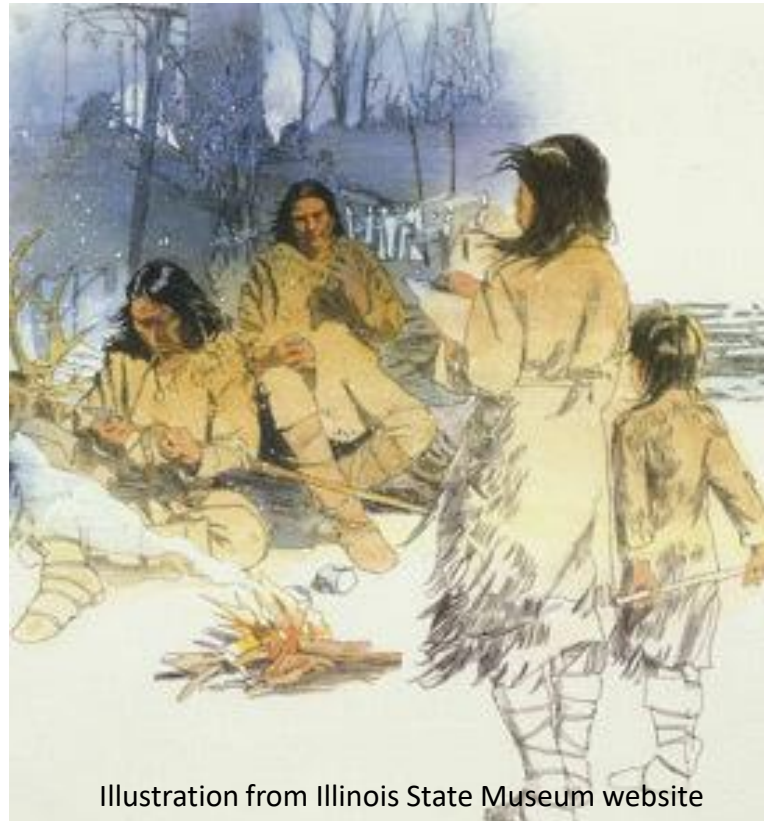


Illustration from Illinois State Museum website

Andrew White (University of South Carolina)

# Social groupings

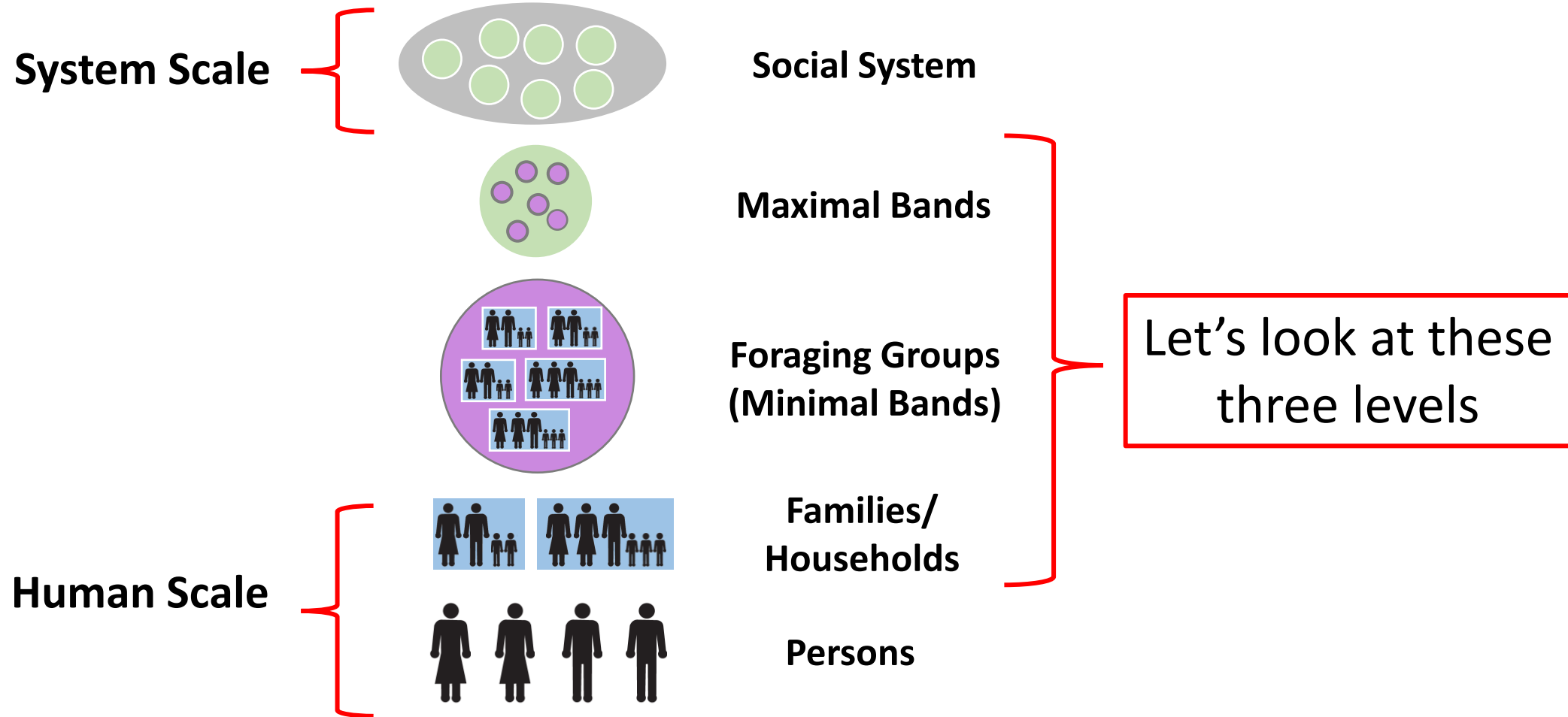
- Social units that comprise the building blocks of a society
- Variable in size and composition
  - Example: families, foraging groups, and bands
- Modular (aggregated/disaggregated into discrete, like components)
- Hierarchically organized

# Who cares?

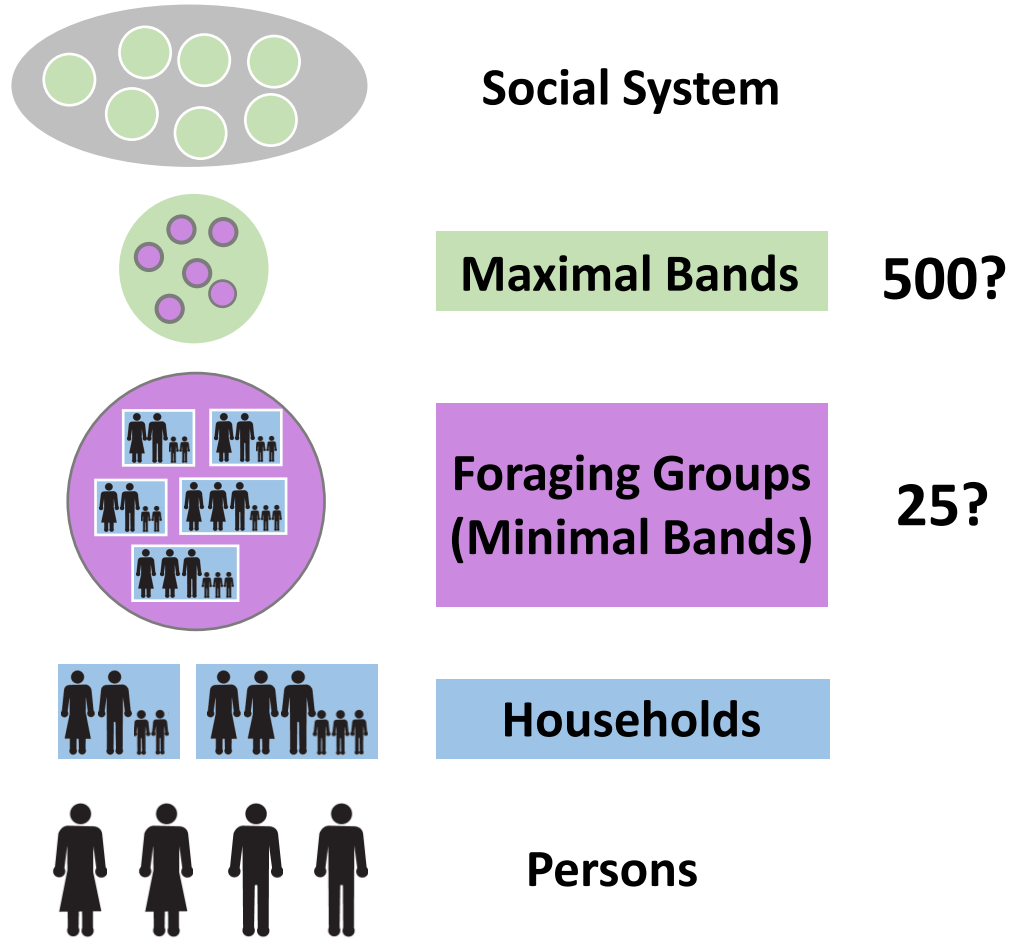


- Different building blocks
- ↓
- Different characteristics
- ↓
- Different properties

# Levels of hunter-gatherer social groupings



# The received wisdom: “magic numbers”?



- Legacy of *Man the Hunter* (Lee and DeVore 1968)
  - foraging groups (minimal bands) of about 25 people
  - regional groups (maximal bands) of about 500 people
- Gregory Johnson’s (1982) “span of control”
  - When more than 6 entities are involved, you need another level of hierarchy

# Making inferences using three lines of evidence

- **Ethnographic data:**

- General patterns of how human groups solve similar problems (subsistence, mobility, group size, etc.)
- Variability of size/structure of basic social groupings

- **Modeling Data:**

- Put building blocks together and set systems in motion, giving us insights into (1) properties of social groupings and (2) archaeological signatures

- **Archaeological Data:**

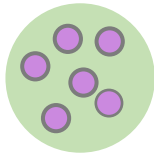
- Direct evidence of human behavior in the past

# Goal

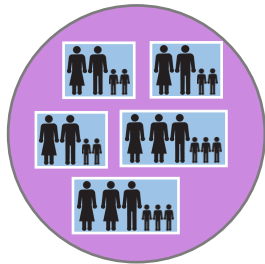
Narrow the range from what is possible to what is probable and consistent with all three lines of evidence

# Families/Households

**Families/households** are “minimally cooperating segments” (e.g., Binford 2001:309; Helm 1965:379; Jarvenpa and Brumbach 1988:607; Keen 2004)



**Maximal Bands**



**Foraging Groups  
(Minimal Bands)**



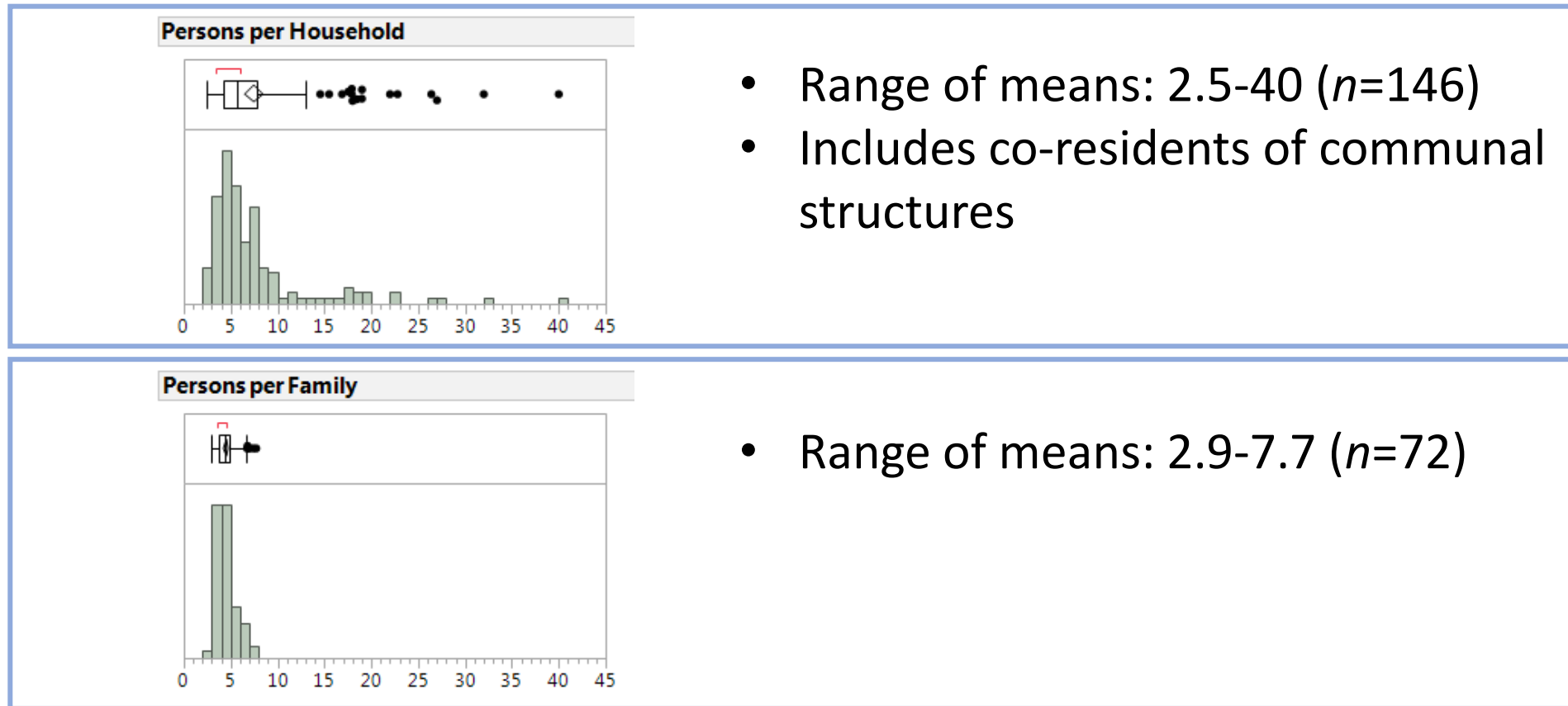
**Families/  
Households**

- “Family:” descent
- “Household:” co-residential
- Simplifying assumption: the family/household is a basic institution of domestic production/reproduction that usually centers on cooperation between males and females of reproductive age



# Families/Households: Ethnographic Data

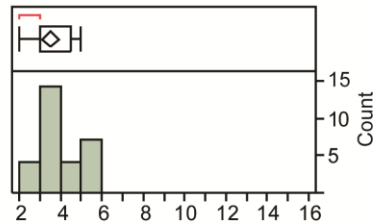
Mean size (data from Binford 2001)



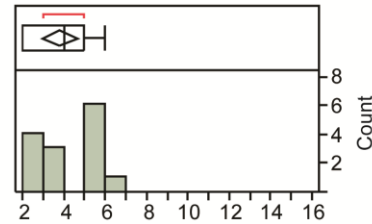
# Families/Households: Ethnographic and Modeling Data

Mean doesn't tell you anything about the distribution of family size

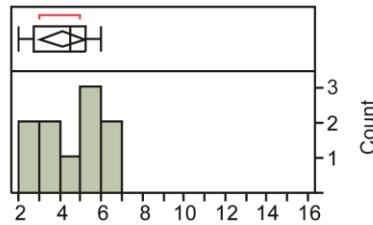
Inupiat (Burch 2006 and Ray 1885)



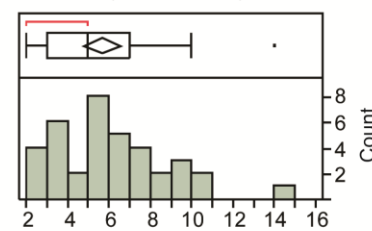
Paiute (Steward 1938)



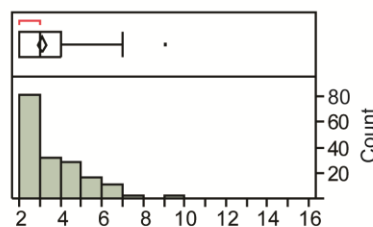
!Kung (Yellen 1977)



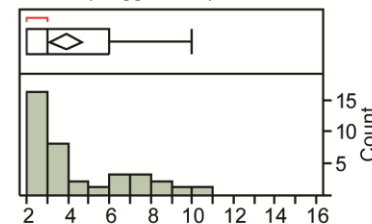
Shoshoni (Steward 1938)



!Kung (Howell 1979)



Walbiri (Meggitt 1962)



- Data on individual family size make it clear that large families are possible in hunter-gatherer societies
- Range: 2-14 persons
- Modeling suggests constraints on family size are related to subsistence through the dependency ratio (White 2013)

# Families/Households: Archaeological Data

Size of residential structures is proxy for family/household size



- **Estimation of the number of occupants (Cook 1972):**
  - 2.3 m<sup>2</sup> for each of first 6 occupants,
  - 9.3 m<sup>2</sup> for each additional occupant
- But for that, of course, you need house structures

## Families/Households: Archaeological Data

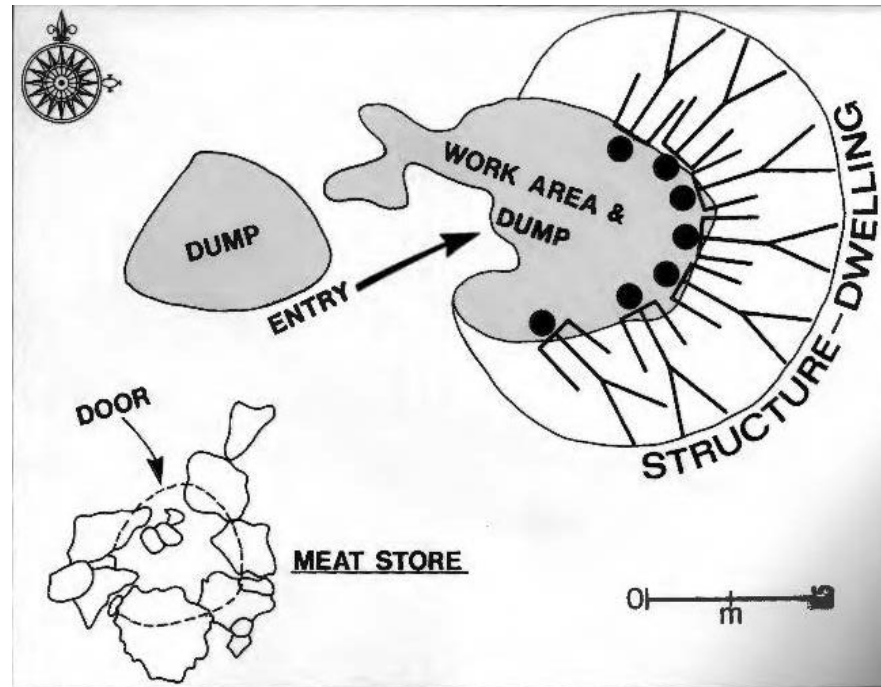
Clusters of artifacts? Many. Discrete houses? Few.

- Two possibilities that I know of:
  - Gramly (1988) describes one possible dwelling area at the Adkins site, perhaps the result of a tent structure enclosing approximately 13 m<sup>2</sup>.
  - An oval/rectangular scatter of postmolds at the Thunderbird site was interpreted as the remains of one or more Paleoindian structures enclosing a maximum area of approximately 21m<sup>2</sup> (Gardner 1974).

# Families/Households

## Adkins (Maine)

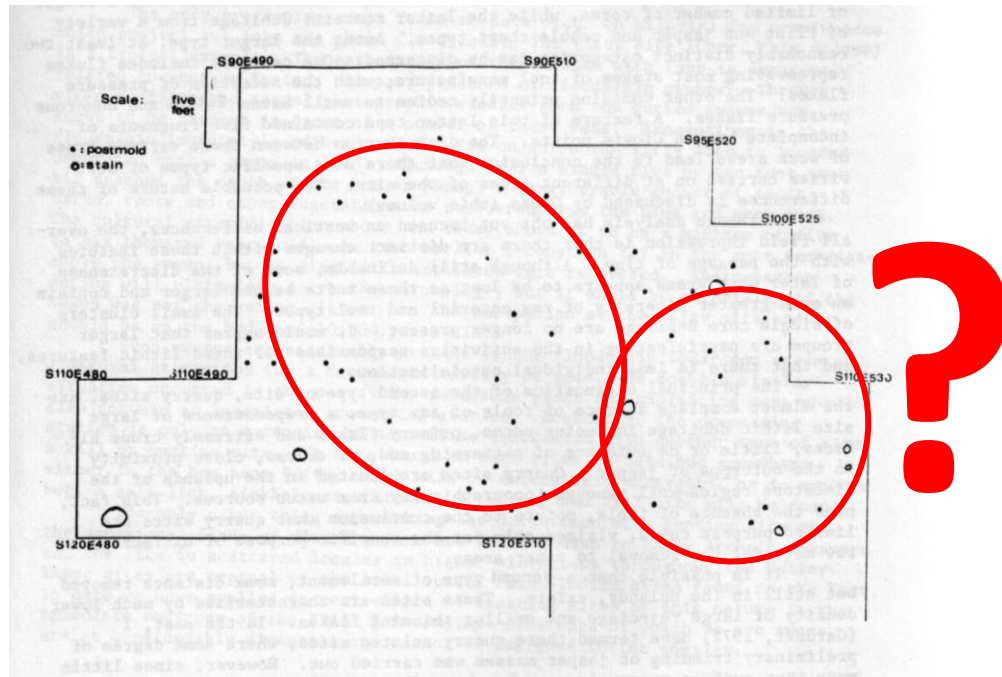
- ~13 square meters = 5-6 people (reasonable for a small family)



Gramly 1988

# Families/Households: Archaeological Data

## Thunderbird (Virginia)

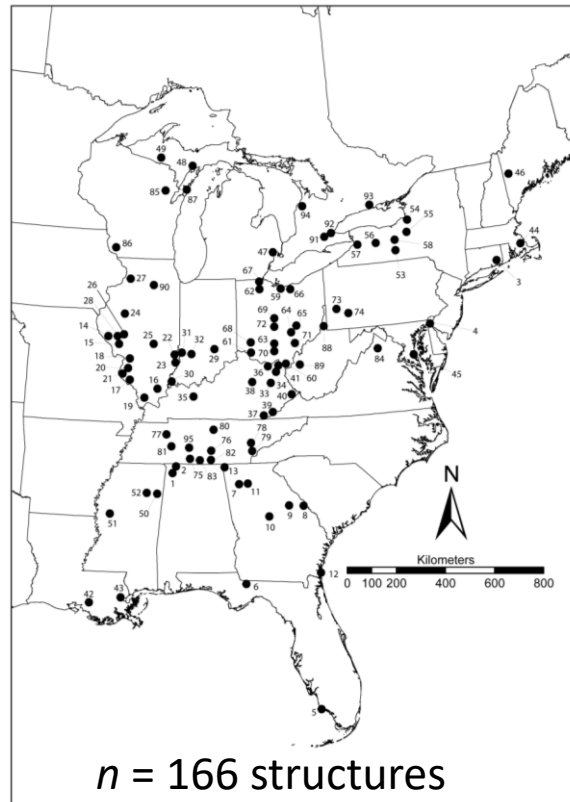


From Gardner (1974:21)

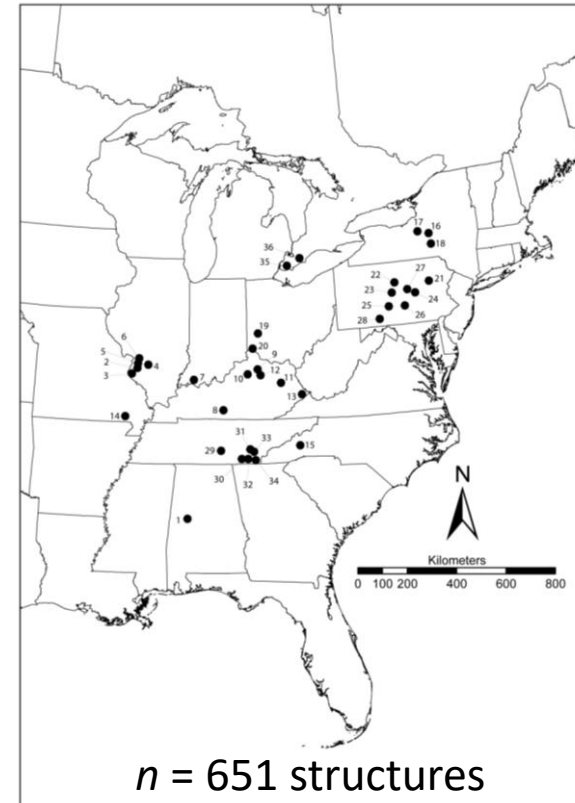
# Families/Households: Archaeological Data

Context: >800 prehistoric structures from eastern North America

**Paleoindian – Middle Woodland**

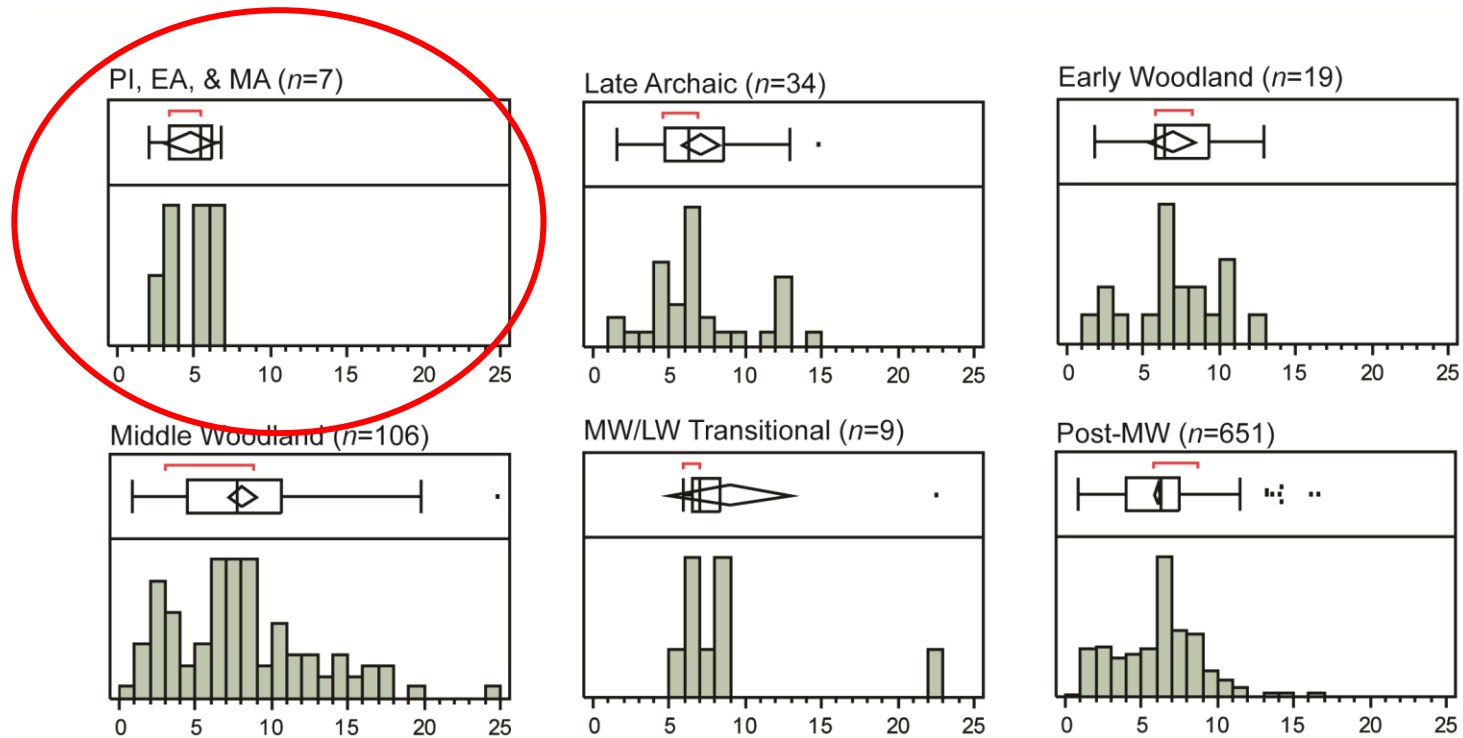


**Post-Middle Woodland**



# Families/Households

No evidence of large domestic structures during the Late Pleistocene/Early Holocene



X axis = estimated number of occupants



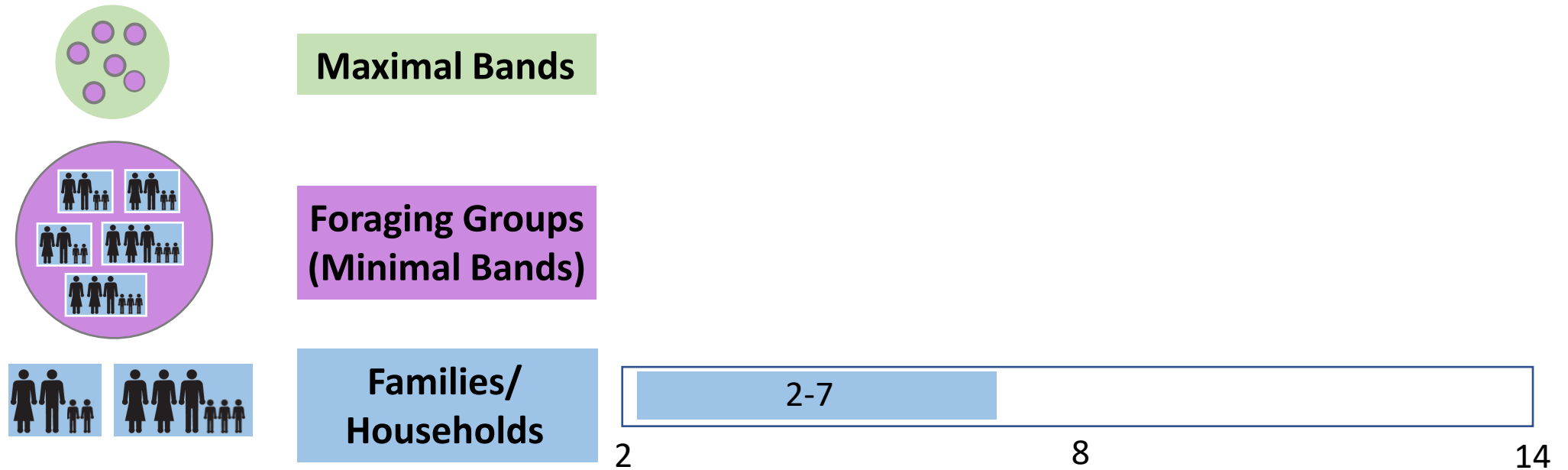
## Families/Households: Archaeological Data

Consistent with the small size of Late Pleistocene and Early Holocene residential structures from western North America and Beringia

- 37 structures from Ushki-I (Kamchatka) range in size from 8 to 100 m<sup>2</sup>, suggesting a mean family size of around 6.5 (see Goebel and Slobodin 1999);
- Structure at the Upward Sun River site (Alaska) suggests a size of less than 10 m<sup>2</sup> (see Potter et al. 2011);
- Purported post structures from the Hell Gap and Agate Basin sites are less than 10 m<sup>2</sup> (see Frison 1982; Irwin-Williams et al. 1973; Knudson 2009).

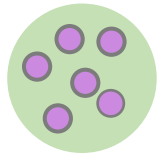
# Families/Households: Summary

Positive evidence is most consistent with small family/household sizes



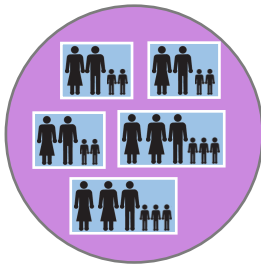
# Foraging Groups

Foraging groups are “on the ground” groups that deal with day-to-day issues of subsistence, mobility, etc.



**Maximal Bands**

- Usually composed of multiple, cooperating families/households



**Foraging Groups  
(Minimal Bands)**

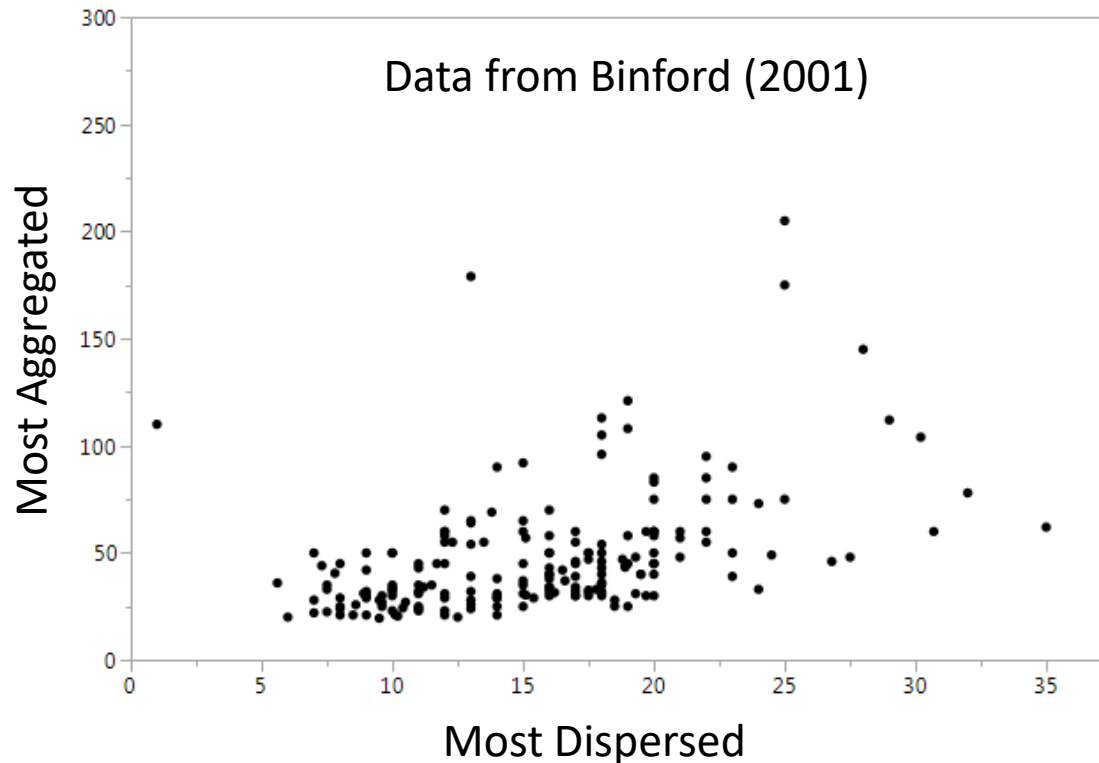
- Big enough to be self-sufficient over the short term, small enough to not rapidly exhaust resources



**Families/  
Households**

# Foraging Groups: Ethnographic Data

Foraging groups are fluid and can vary drastically in size



- Most dispersed: ~5-35 persons
- Most aggregated: ~20-650
- But at what point do these become “regional aggregations”?

## Foraging Groups: Ethnographic Data

- Kelly (1995) compiles ethnographic data on 16 ethnographic cases of residentially mobile hunter-gatherers with foraging group sizes ranging from 15-75
- An ethnographic range of 5-75 seems like a reasonable framework for the outside sizes of residentially mobile foraging groups

# Foraging Groups: Ethnographic Data

## The “Magic Number” of 25: Why?

- Kelly (1995:211)

25 people = 5-7 families (mean family size of 3.6-5)

- Organizational/logistical: greater than 6 families and you start to have span of control issues (Johnson 1982)

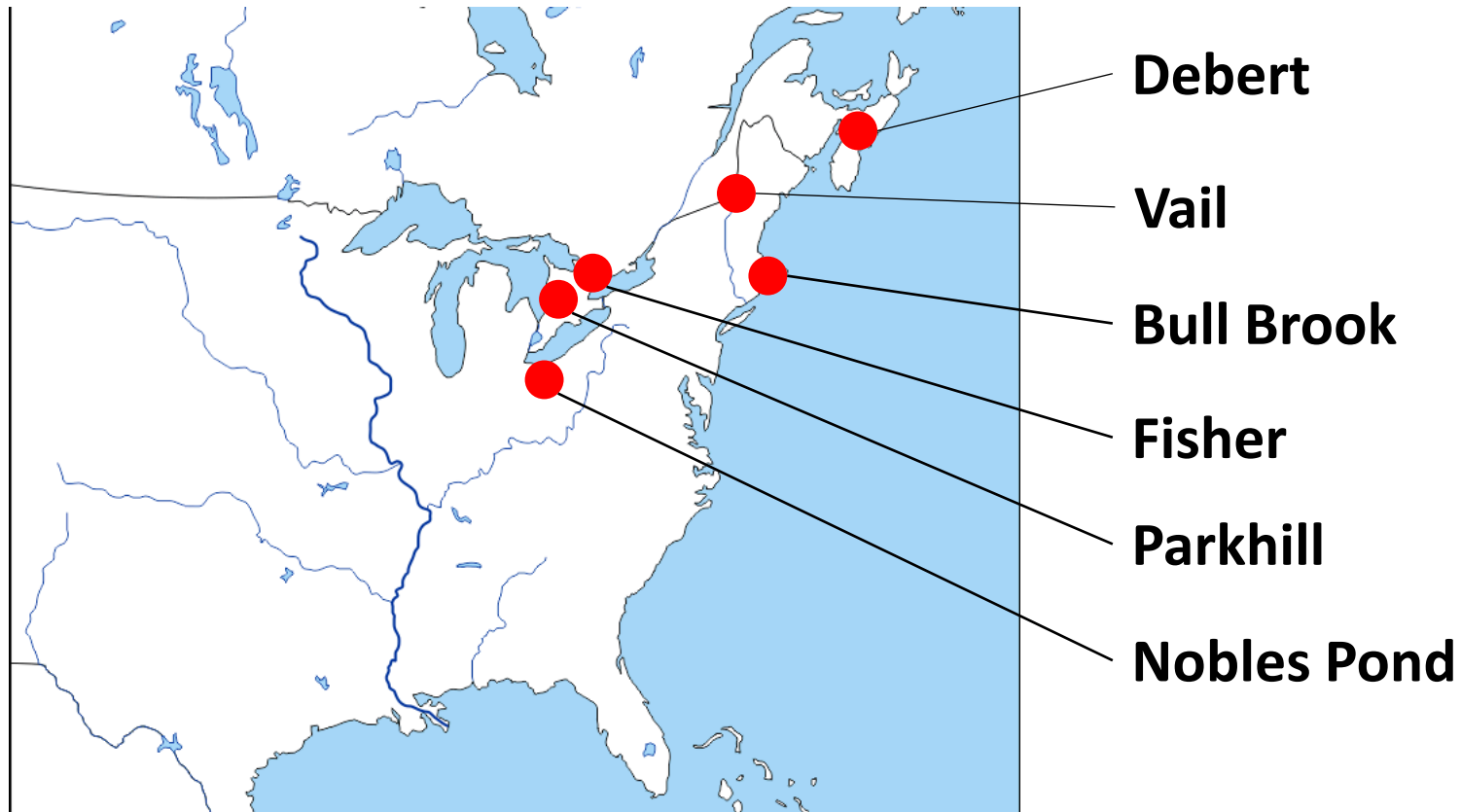
# Foraging Groups: Modeling

Has there been any?



# Foraging Groups: Archaeological Data

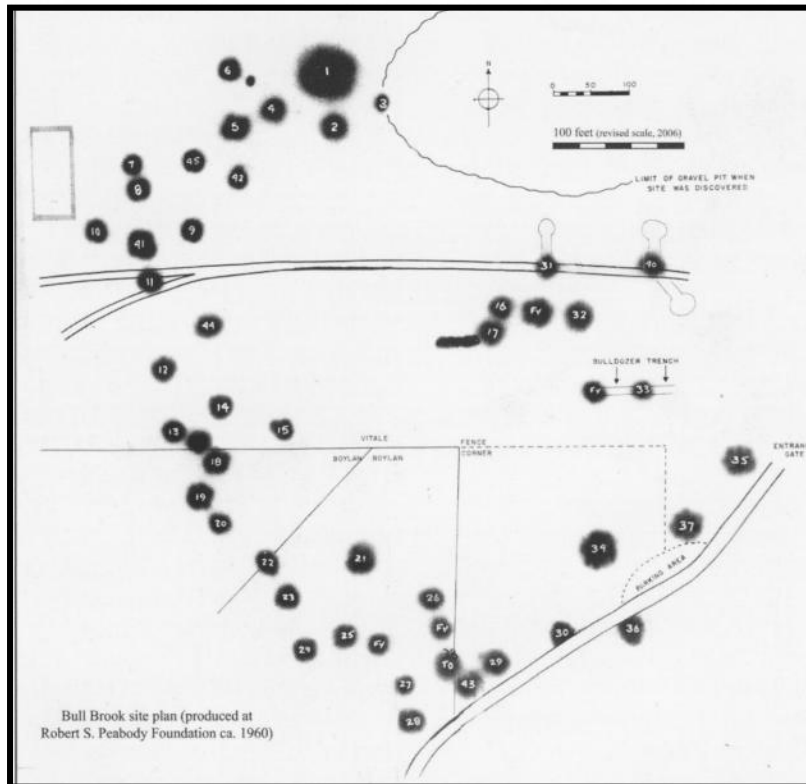
Sites with what appear to be simultaneously occupied habitation loci





# Foraging Groups: Archaeological Data

## Bull Brook (Massachusetts)

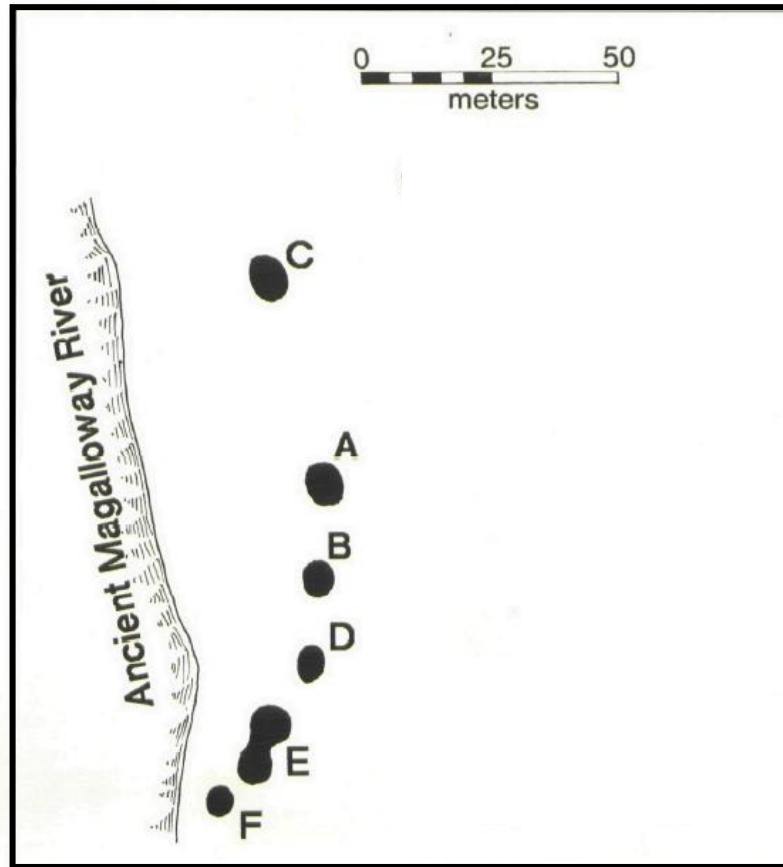


Robinson et al. 2009:432

- Habitation loci for 28 family-sized groups (Robinson et al. 2009:442)
- If we presume 4.5 people/tent, group size = 126 people

# Foraging Groups: Archaeological Data

## Vail (Maine)

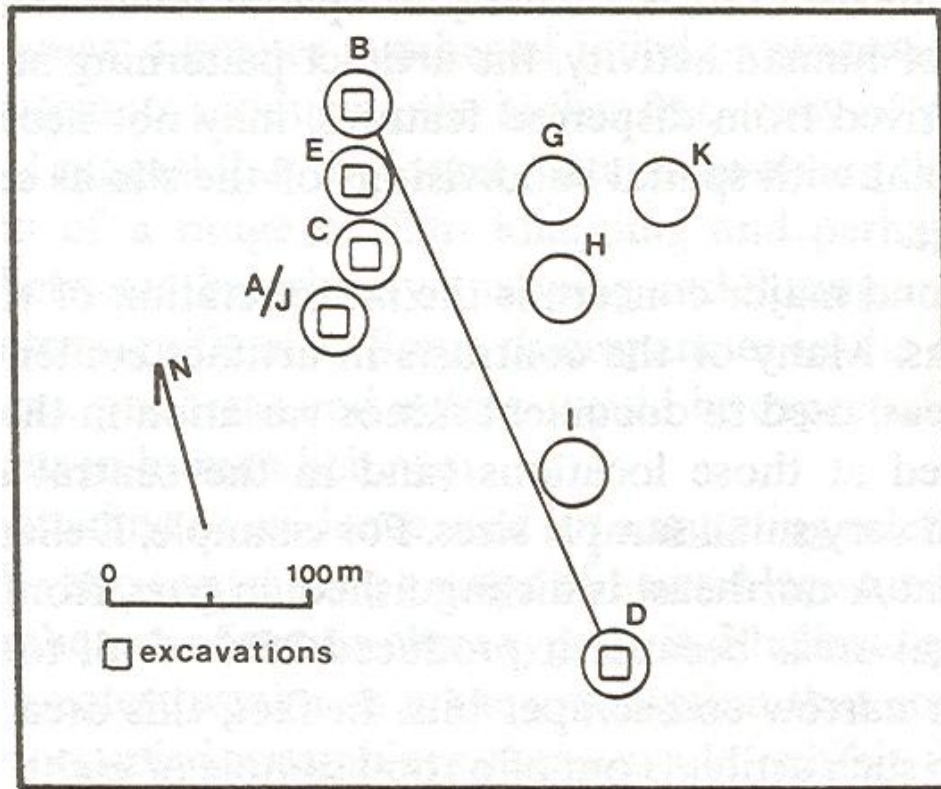


Gramly 2010:15

- Six tents, simultaneously occupied (Gramly 2010:4-5)
- If we presume 4.5 people/tent, group size = 27 people

# Foraging Groups: Archaeological Data

## Parkhill (Ontario)

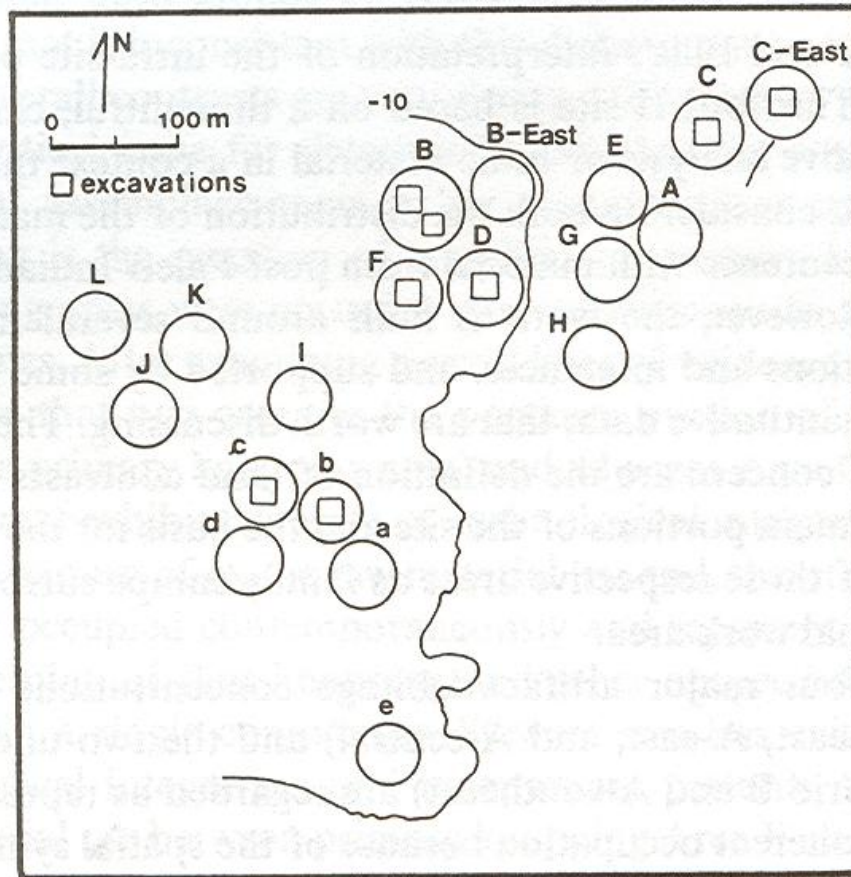


Storck 1997:262

- Nine concentrations of lithic debris
- Likely created by repeated, group-level occupations (Ellis and Deller 2000:251)

# Foraging Groups: Archaeological Data

## Fisher (Ontario)

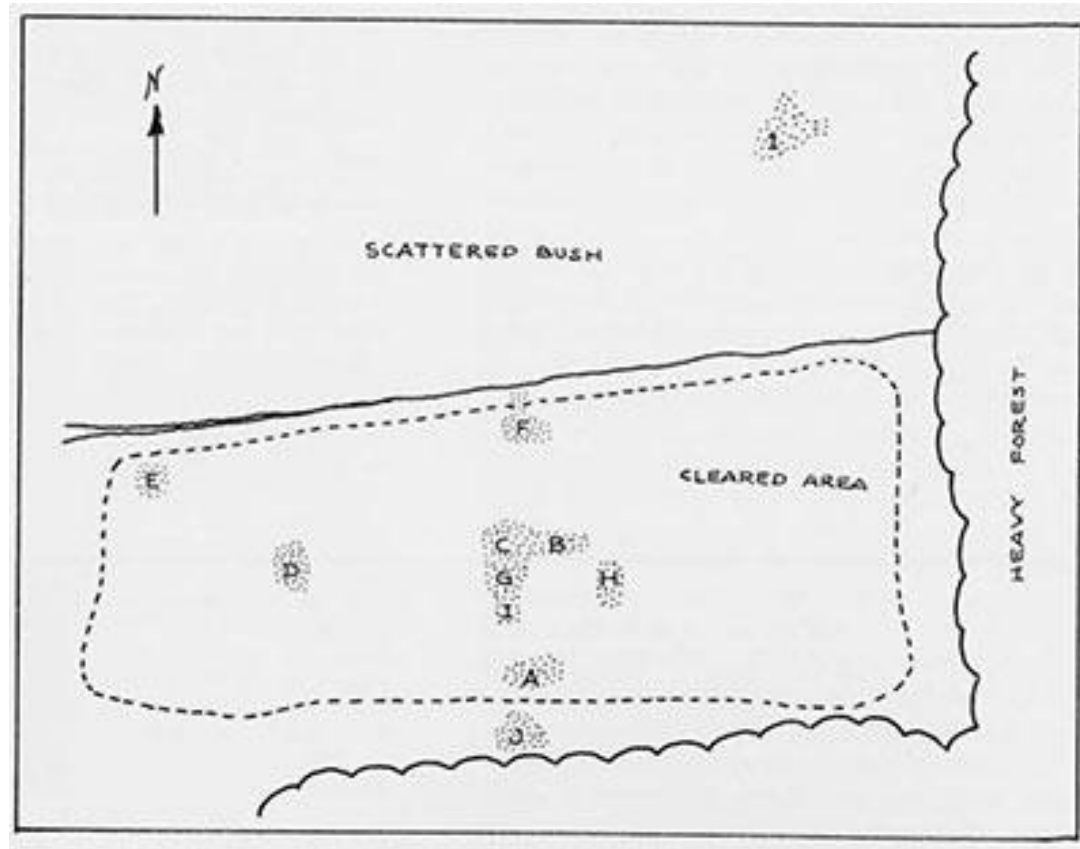


Storck 1997:262

- Nineteen artifact concentrations up to 40-50 m in diameter
- Interpreted as probably the result of multiple occupations (Storck 1997)

# Foraging Groups: Archaeological Data

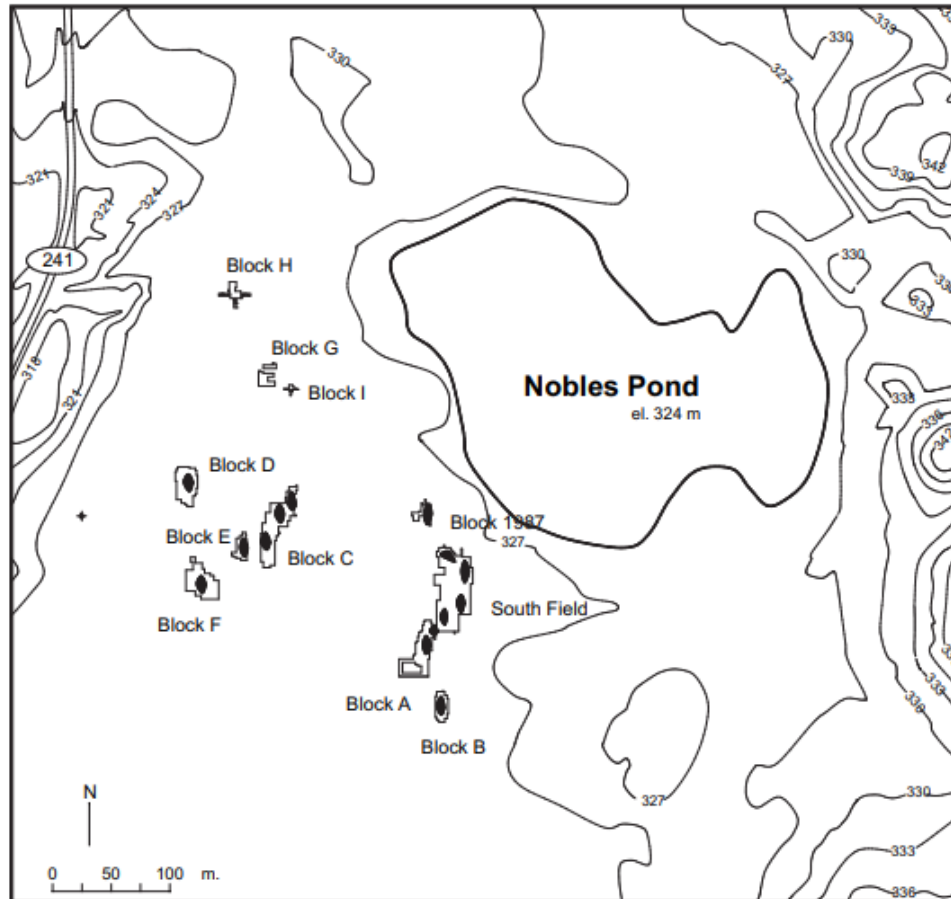
## Debert (Nova Scotia)



- Created through multiple occupations (Ellis and Deller 2000)?

# Foraging Groups: Archaeological Data

## Nobles Pond (Ohio)



Seeman et al. 2008:2744

- Six 10 x 15 m concentrations
- Probably contemporaneous (Seeman et al. 2008:2743)
- If we presume 4.5 people/concentration, group size = 27 people

# Foraging Groups: Archaeological Data

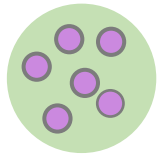
Good candidates for simultaneous occupations

- Nobles Pond (6 “families” perhaps comprising 24-36 people)
- Vail (6 “families” perhaps comprising 24-36 people)
- ~~• Bull Brook (28 “families” perhaps comprising 112- 168 people)~~

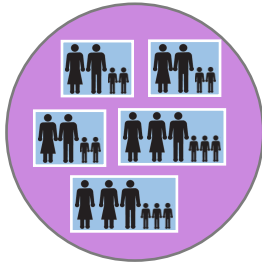
Aggregation

# Foraging Groups: Summary

Positive data are most consistent with foraging groups of 24-36 people (perhaps composed of 4-6 families)



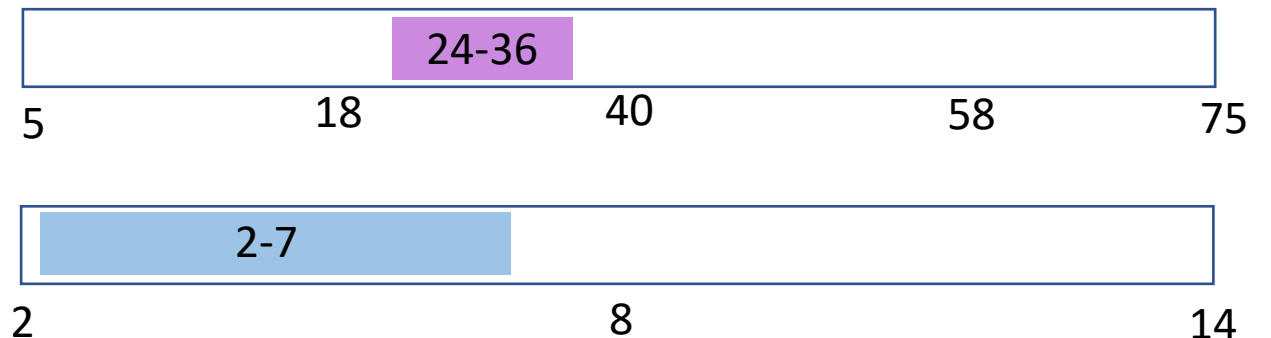
Maximal Bands



Foraging Groups  
(Minimal Bands)



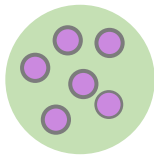
Families/  
Households



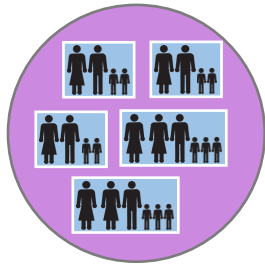


# Maximal Bands

**Maximal Bands** are self-identifying social units comprised of multiple minimal bands (see Steward 1969; Wobst 1974)



**Maximal Bands**



**Foraging Groups  
(Minimal Bands)**



**Families/  
Households**

- Shared dialect, cultural rules (?)
- High social inter-connectivity
- Periodic aggregations facilitate marriage, exchange, information transfer, and a variety of communal activities (see Conkey 1980; Damas 1968; Kelly 1995; Walthall 1998)

# Maximal Bands

## The maximal band and the “magic number” 500

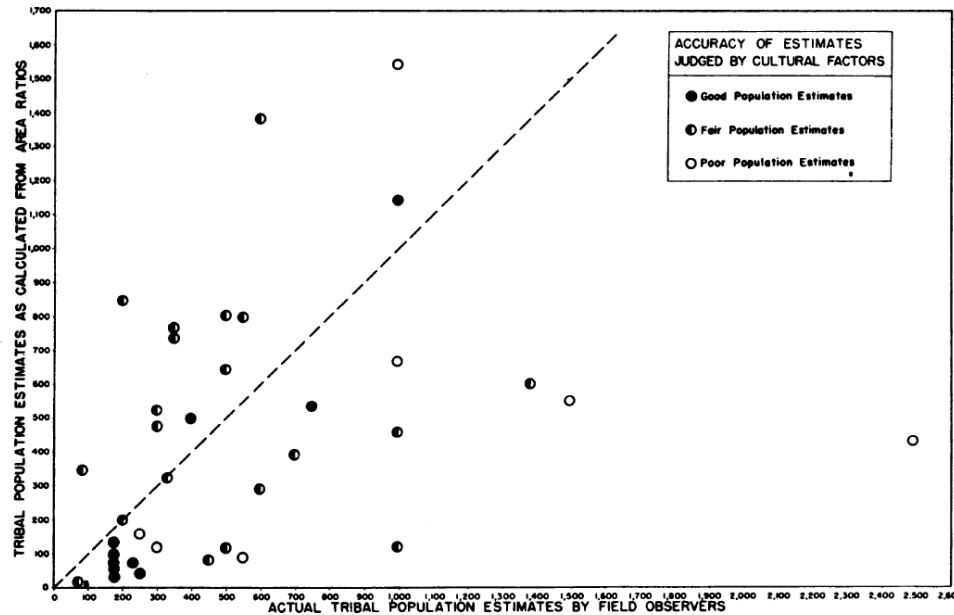


FIGURE 8. Correlation between tribal population estimates from early observers and those calculated by area ratio methodology.

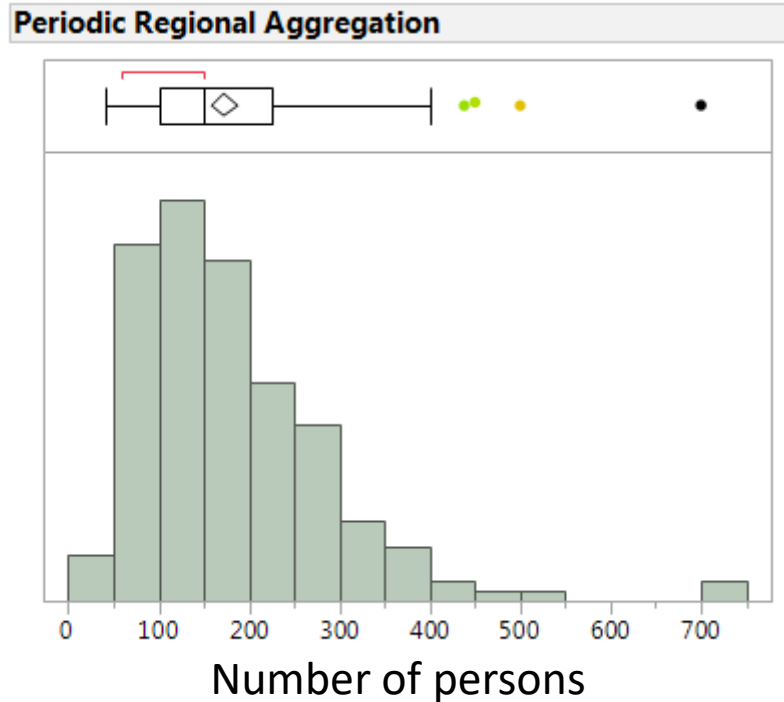
Birdsell 1953

Birdsell (1968:246) himself points out that there’s nothing “magic” about the number 500:

*“It was explained very carefully at that time [in 1953] that for Australia, 500 was a central tendency . . . The number 500 was derived from taking early observers’ estimates . . .”*

# Maximal Bands: Ethnographic Data

The size of the “maximal band” varies widely



Data from Binford (2001)

- Range: 40-700 ( $n = 197$  cases)
- Mean: 173 persons

# Maximal Bands: Modeling Data

## Martin Wobst's (1974) "Minimal Equilibrium Size"

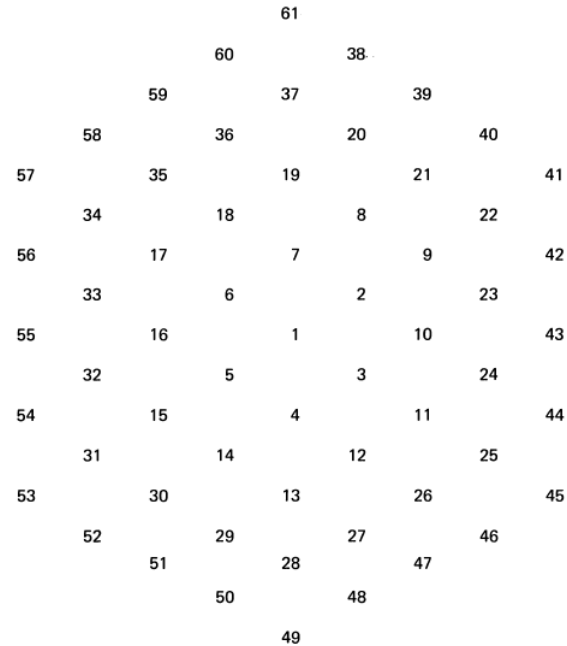
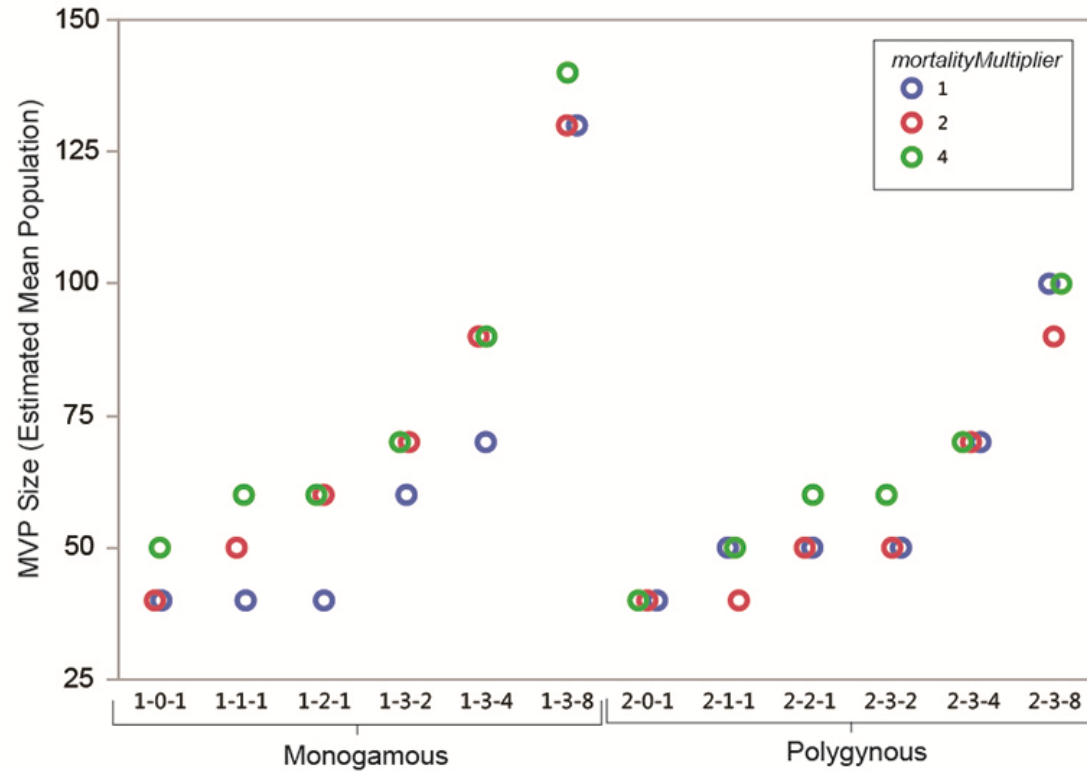


Fig. 1. Arrangement of minimum bands in the simulation runs. The bands are numbered in terms of their closeness to Band 1 within the hexagonal matrix.

- Maximal bands assumed to be as small as possible to ensure demographic viability over the long term
- 79-332 people (175-475 when situated in hexagonal space)

# Maximal Bands: Modeling Data

How few is too few?



- Populations of 150 are demographically viable under a wide range of conditions (White 2017)

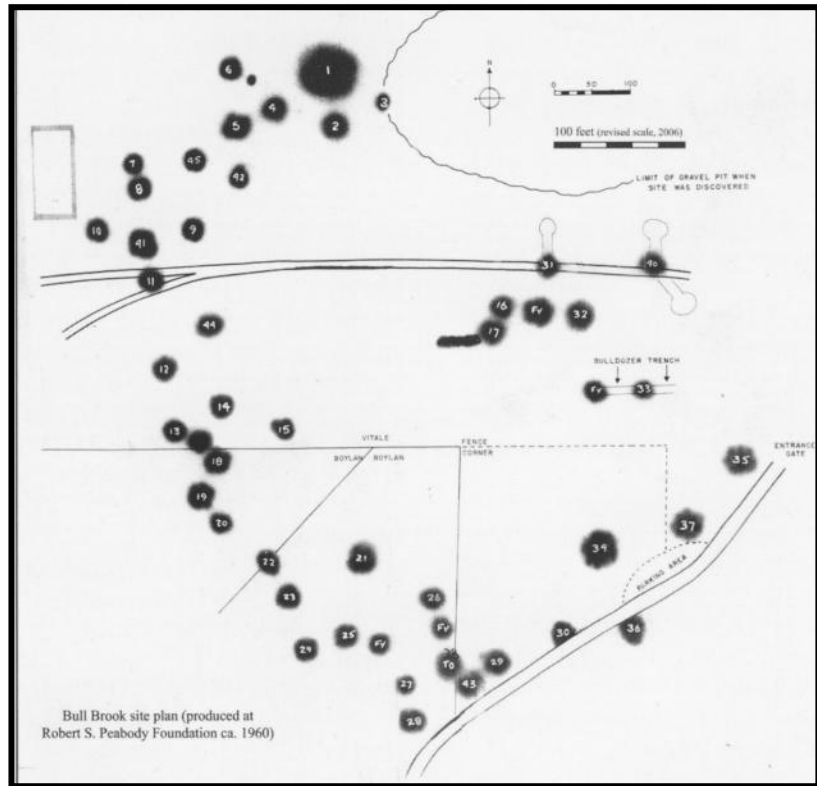
# Maximal Bands: Archaeological Data

Direct evidence of maximal band size?

- Sites with evidence of large, simultaneous occupations (Spoiler alert: Bull Brook again)
- Landscape use: patterns of raw material transport?
- Cultural geography: patterns of stylistic variability?

# Maximal Bands: Archaeological Data

## Bull Brook (Massachusetts)



Robinson et al. 2009:432

- Habitation loci for 28 family-sized groups (Robinson et al. 2009:442)
- If we presume 4.5 people/tent, group size = 126 people

# Maximal Bands: Archaeological Data

Is that all we've got?

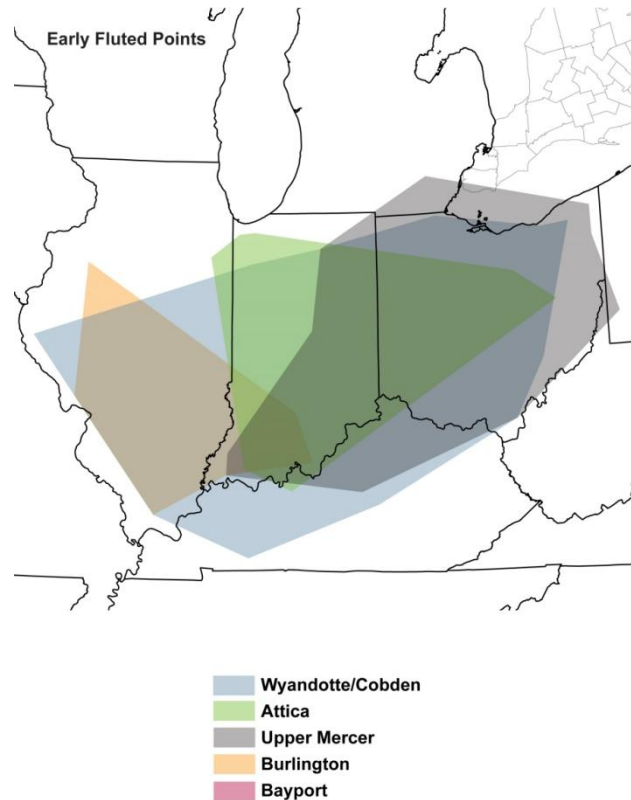


- Size of Bull Brook = 1.8 hectares
- Smaller than other sites with habitation clusters that have evidence for sequential occupation
  - Nobles Pond (9 ha)
  - Parkhill (6 ha)
- No direct evidence (that I know of) for Paleoindian sites occupied simultaneously by more than 150 people



# Maximal Bands: Archaeological Data

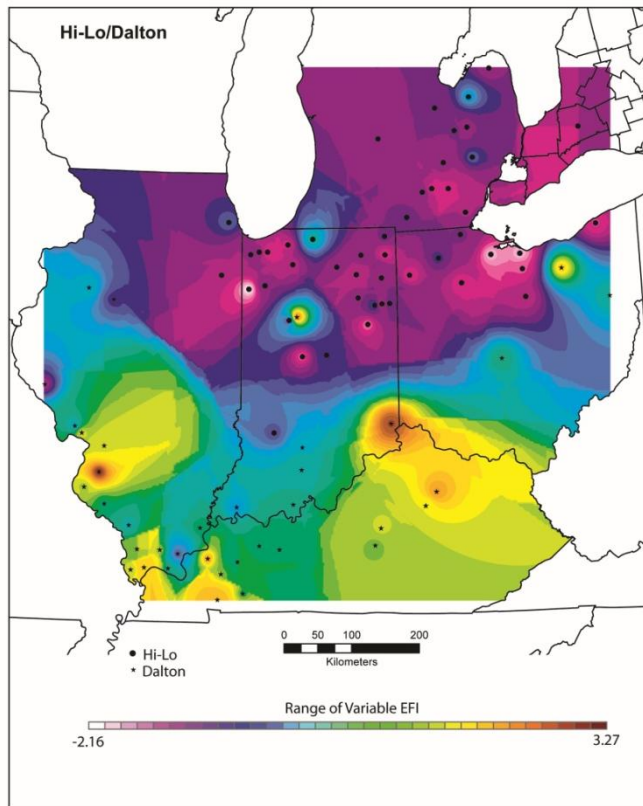
## Transport of lithic raw materials?



- Transport patterns tell us something about *dimensions* of residential mobility (scale, frequency, etc.)
- Interpreting them in terms of maximal band size/configuration is problematic:
  - Requires assumption that band “territories” can be defined by lithic distributions
  - Requires assumptions about population density

# Maximal Bands: Archaeological Data

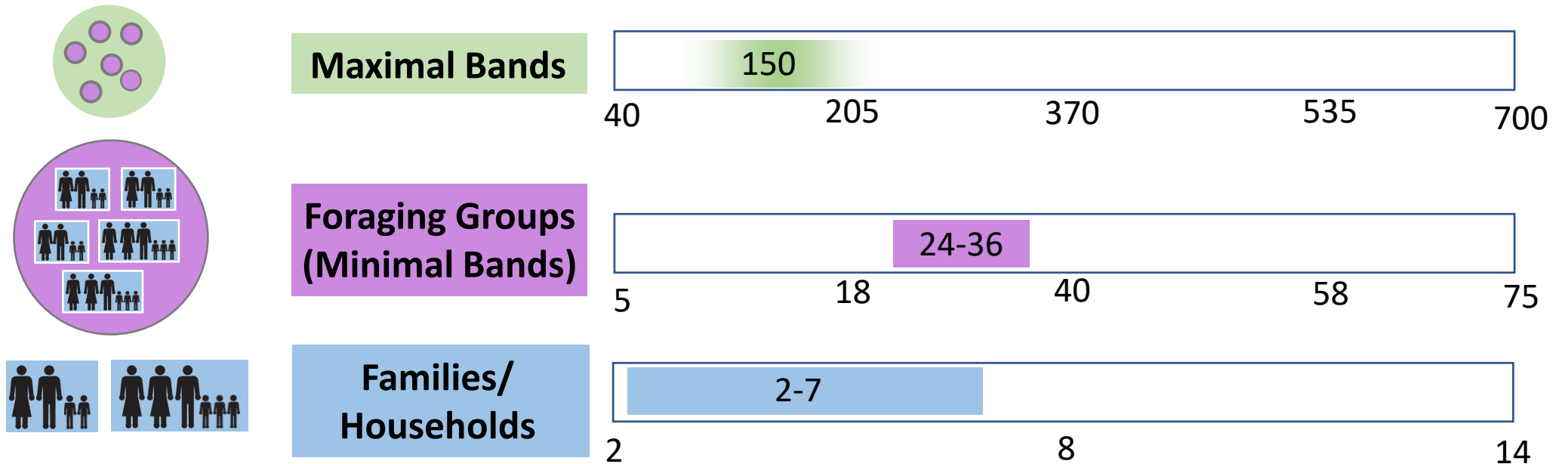
## Patterns of stylistic variability?



- These tell us *something* about the social fabric
- Interpreting them in terms of band territories and patterns of interaction is problematic:
  - We lack a good understanding of how patterns of human interaction “map up” to large scale patterns of stylistic variability
  - Again, translating a geographic area into an estimate of band size requires assumptions about population density

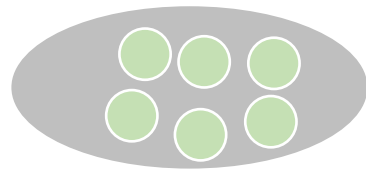
# Maximal Bands: Summary

Positive data converge on a reasonable (minimum) maximal band size of perhaps 150 people

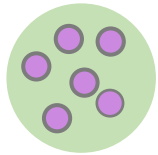


# Conclusions

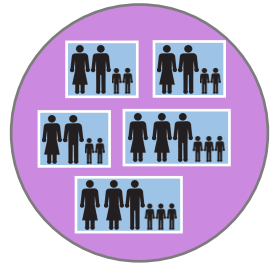
What is possible, and what do we actually have positive evidence for?



Social System



Maximal Bands



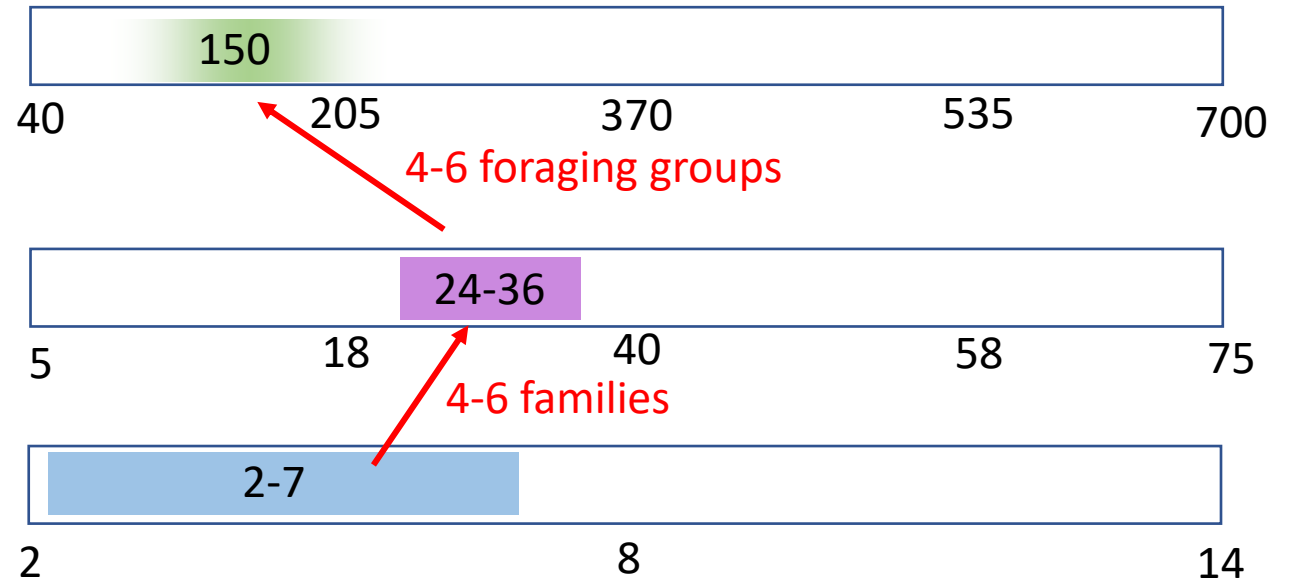
Foraging Groups  
(Minimal Bands)



Families/  
Households



Persons



# I'm not saying 150 is “magic number,” but . . .

- 150 seems to be fine for demographic viability (White 2017)
- 150 actually comports pretty well with Wobst's (1974) results
- 150 is near the lower limit in the ethnographic data compiled by Binford (2001)
- 150 is, coincidentally, six units of 25
- 150 is also Dunbar's number
- 150 is consistent with what we see at Bull Brook
- There's no empirical/theoretical evidence for anything larger among eastern Paleoindian groups

# When is 150 not enough?

- If 150 is sufficient for demographic viability, why do we see so many hunter-gatherer societies larger than 150 persons?
- Whallon (2006) argued that personal mobility was sometimes used to establish and maintain social ties over a wide area as a strategy for buffering localized resource scarcity (see also Kelly 1995:153).
- Social networks created and maintained through aggregation, personal mobility (group fluidity, marriage), and gift exchange serve as a “safety net” to mitigate the risks associated with hunter-gatherer lifeways.

# Finally: north vs. south?

- Do we not have these “occupational cluster” sites in the Southeast?
- Preservation/recovery bias?
- Or adaptational difference in northern and southern Paleoindian social/economic systems (see Meltzer 1988)?

# Thank you

- Scott Jones and others in the symposium



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