

WOLVES & HUMANS

The Science Museum of Minnesota

COGNITIVE MAPPING

Social carnivores that hunt in groups, such as the wolf or early man, shared some similar problems concerning survival: for example, the problem of maintaining pack or group cohesion and hunting and traveling within a large territory. Both needed, developed and utilized complex communication systems. Both formed integrated groups, but also needed an intellectual adaptation which would allow individuals to be able to travel separately and be able to comprehend the area so to easily rejoin the group. Both needed to develop the intellectual ability to remember and understand the space within their territories.

"Cognitive mapping," a term coined in 1948, can be defined as any mental representation (mental map) or conception of an area that allows "insightful" travel through a geographic area. "Insightful travel" means being able to choose short cuts or novel routes to a selected destination. This is different from random wandering or using marked and familiar trails. It is travel with a destination in mind, such as when a wolf is returning to a den, kill, or rendezvous site.

Cognitive mapping may have provided a structural and functional foundation for language. It may have been a major factor in the intellectual development of man. Man has learned to vocalize in detail about his area and verbally share that information with other humans. Transmitting information about a location using landmarks he has perceived, he can say, "I saw many deer, by the river, past the stand of pines near the boulder." Landmarks play a significant role in the ability to understand one's territory and utilize that territory most efficiently. Man has also learned to draw maps to define locations, indicating routes and landmarks and how they relate to each other spatially.

Wolves on the other hand use scent marks and visual marks to define familiar borders, junctions, and locations. They also sometimes use vocalizations (see sections on olfaction and vocalizations.) While these marks aid wolves and provide familiar trails, wolves also appear able to choose novel routes, short-cuts and efficiently arrive at a specific destination as well. Wolves use a "mental map" to move "insightfully" through their locality. This enables wolves, like man, to use their territory effectively, without confining them to only familiar marked routes. They are able to use prominent features of the landscape to recognize and determine locations and directions. Cognitive maps are only useful if you have a destination.

Random wandering is not an effective use of one's territory. In hunting, for example, remembering locations where kills have been made would enable a wolf to return and perhaps increase his odds for future hunting success. Understanding their terrain allows packs to know where prey is most likely to be, or be running to, to know the fastest way to get there, and to allow each pack member to use various routes to ambush and/or close in on that prey.

Besides the obvious reasons why it would be good to remember where the den was, it would be valuable for a wolf to know the territory well enough that he could

choose and use novel routes back to it. For example, if the traveling wolf heard an alarm bark issued from the den site he would want to get back to the den with utmost haste. He could then return and decoy or chase the intruder from the den. To return with speed and accuracy, use short cuts and plan a decoy maneuver the wolf must have an understanding and conceptual knowledge of the territory. Wolves have a sense of direction and a refined sensitivity to their environment. They apparently are also quite sensitive to changes in their area. This would certainly be an asset if those changes or disturbances indicated the presence of danger.

Evidence that wolves use "cognitive maps" indicates that they have well organized memories. We know that scent marks are perceived and remembered and help to delineate territory. Wolves place these scent marks at special points of interest, like kills and rendezvous sites, but also at visually significant locations and landmarks, junctions, and territory edges.

When humans draw maps, they usually draw the edge of the territory, then routes and landmarks of import, intersections and junctions. Humans, then, use many of the same organizing principles observed in wolf movements and scent marks. "Cognitive wolf maps" are like "cognitive human maps" in many ways.



MAPPING AND TERRITORY ACTIVITIES

The following maps are worksheets to be duplicated and given to students. To get the maximum out of these exercises, the sections on Olfaction, Vocalization and Territory should be finished first.

****Map number one** depicts a wolf pack's territory. The map symbols are furnished and students can draw them in according to what they have learned about wolves movements and scentmarking.

Discuss the map and work on it together using probable landmarks that would be within wolf territories and invent hypothetical situations relevant to wolves and wolf activities.

Students must first locate the den and rendezvous site. In doing this, they must consider that there are adjacent wolf packs. Dens would therefore not be located near edges. They must also consider that females and pups need water. The female should not have to travel far to get water while she is caring for pups in a den. Students can choose different sites for their den and rendezvous site, but the choices should show understanding about how wolves use their territory and what environmental needs they have.

Tracks: A trail made by the resident pack may be mapped out with white tracks. Where they pass or encounter black tracks of the non-resident "intruders" depicting a "trespassing pack" an arrow in black can be shown indicating a negative scent. Tracks can depict what action the resident pack may choose after such an encounter.

Arrows: Black arrows are used to depict negative scents or encounters, such as human tracks, dwellings or encounters, those things to avoid. White arrows will indicate sites and odors that have a positive implication such as deer, deer trails, familiar trails, rendezvous sites, kills, caches.

Junctions can be shown to have significant landmarks such as a boulder, and a black or white arrow to indicate if it was marked by the resident pack or intruders, and/or male or female symbols.

Familiar trails or trails leading to and from kills or caches can show many tracks indicating extensive use.

Wolves do use snowmobile trails and logging roads for travel.

Teachers can set up situations or variations to help students try to move through their territory as a wolf might (e.g., a logging road with a fresh scent of man or a kill site that a man discovered and was near).

Breeding season might be depicted with double scent marks made by the breeding pair as they travel within the territory. Use male and female symbols.

Symbols may be invented and added (for example, coyote movements or fox and ravens visiting a kill).

**Map 2 is for students to map their own territory. They should use familiar landmarks, junctions, home (den), play sites (rendezvous site), ice cream shop (kill or cache), railroad tracks (danger areas), etc.

Areas considered dangerous or threatening can be shown with arrows as was used in Map 1.

**A third map can be made based on a brief trip. Students can go for a short excursion with the teacher to a park or within the neighborhood. When they return to class they should each draw a map of where they have been.

Note: students can be told or not be told that they will make a map but probably should be told to be observant of the territory they travel through during the trip. The age of the children will have to be considered. The teacher might wish to have them think of themselves as a wolf pack moving through their territory.

After making the maps, the following can be discussed:

All have been on the same trip, are all the maps the same? What landmarks did everyone show?

If they traded maps, would they understand each others' maps?

How well do they know their territory? How well did they remember where they had been?

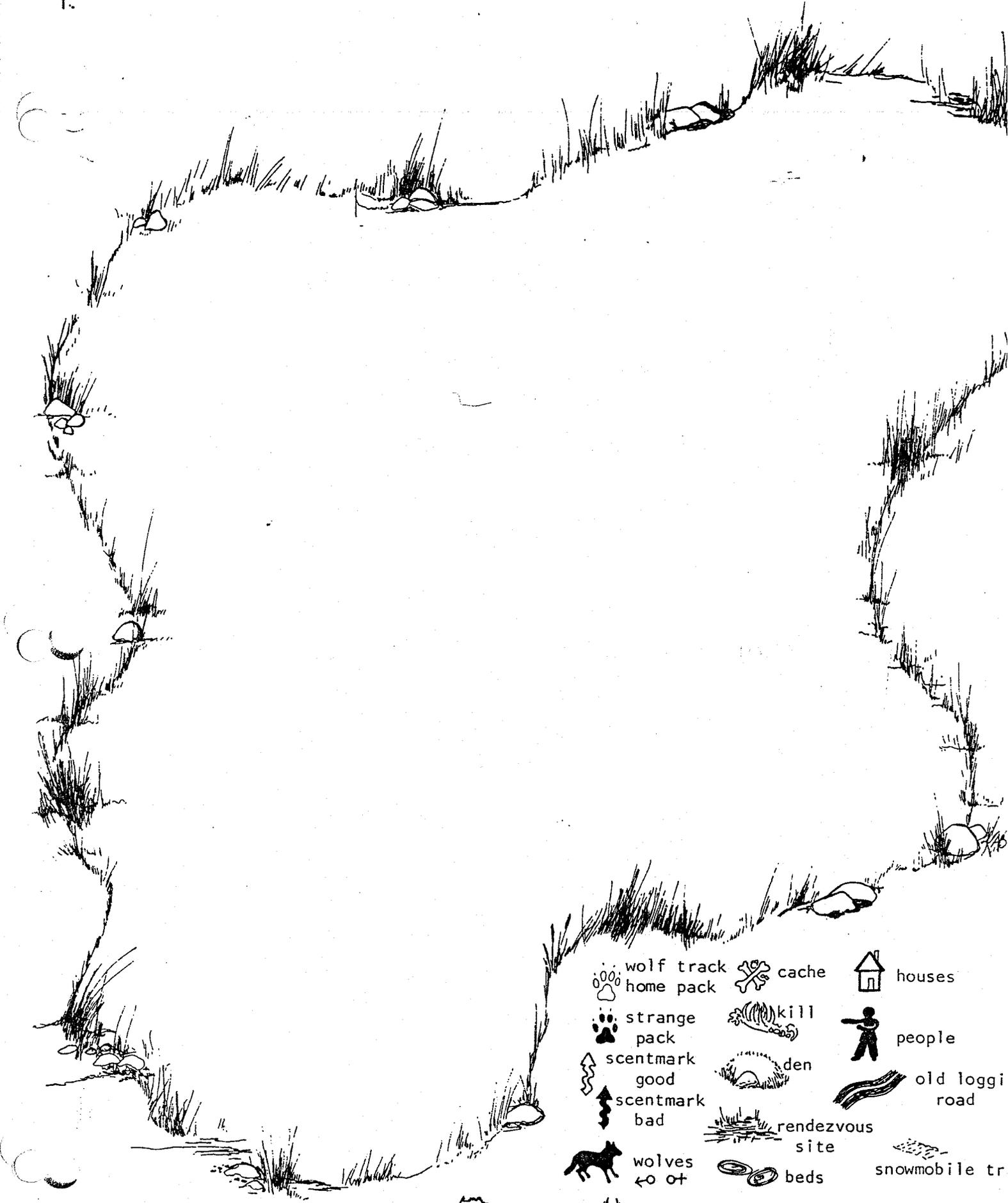
How did each perceive the area? A person interested in plants may use plants and trees spontaneously as his guidepoints or landmarks. Another person may focus on another aspect of the area such as rock formations, stores, cars, or junctions.

How did students draw their maps?

Did each outline the territory first and fill in landmarks in relationship to the edges?

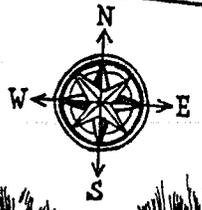
How did they depict the area outside the territory?





MAP SYMBOLS:

-  wolf track
  home pack
  cache
  houses
-  strange pack
  kill
  people
-  scentmark good
  den
  old loggi road
-  scentmark bad
  rendezvous site
  snowmobile tr
-  wolves
  beds
  cover
-  deer
  deer tracks
  water



SYMBOLS:

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