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LATTICE

ARCHITECTURE



M. arch II Thesis

submitted by Elizabeth M. Quick

primary advisor: Mark Linder

secondary advisor: Michael Pelkin

Lattice Architecture

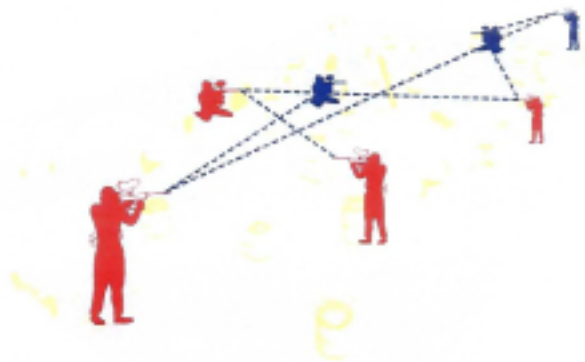
- 01:** Thesis Statement
- 02:** Extrinsic Trajectories
- 03:** Intrinsic Trajectories
seasonal population influx,
military and leisure history,
bird migration and habitation
- 04:** Projected Trajectories
- 05:** Programming Dcu-Park
- 06:** Welcome to Dcu-Park
- 07:** Ocular Command Center
- 08:** Bibliography

Lattice Architecture

Lattice Architecture is an immersive and connective architecture that instigates and facilitates interaction between historical networks of surveillance and ecological networks of bird habitation and migration.

Ocu • park is situated at the very end of Long Island's South Fork on Montauk's former Camp Hero. Embedded within this former military base is a diverse maritime habitat dotted with de-facto bunkers, radar tower, and other military installations. In 2002 the former military base became a state park which welcomes hiking, fishing, and picnicking. Evident today is the integrated relationship between the 'run-down' military installations and the thriving maritime habitat.

Ocu • park establishes connectivity with: the educational program of Montauk's Lighthouse and Camp Hero's military complex, ecological program of bird watching, and existing and proposed recreational activities. Weaving recreational, ecological, and historical flows together instigates an immersive park where eco-tourists monitor bird migration, Hampton vacationers track RADAR history, and techno savvy teenagers geocache through the wetlands.



- **tracker:** soldier in field
- **target:** opponents in field
- **interface:** gun - bunkers



photo from www.flickr.com uploaded July 15 2007 by Full Clip photo namaSEL7771.jpg



Recreational / Military Training Facilities

size: 5 indoor fields 7 outfields

user: law enforcement military civilian



Shadow Tactical Operations Center

324 Yolanda
Santa Rosa, CA
707-578-9600
<http://www.shadowtactical.com>

games: CQB, airsoft, gaming



Tactical Airsoft Center

address: TBA
phone number: TBA
<http://www.tacticalairsoft.com>

108
508

games: Sentry Stalking, Man Tracking, Combat Techniques, CQB, Sniping, Domestic Threat Response, and Tactical Recovery of Aircraft and Personnel

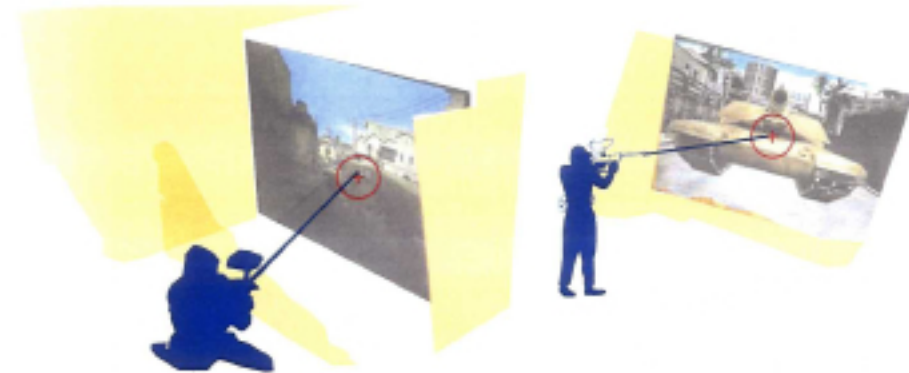


Airsoft CQB field

10902 Carolina Dr.
Manassas, VA 20110
Field : (703) 325-6800
<http://www.airsoftcqb.com>

10
10

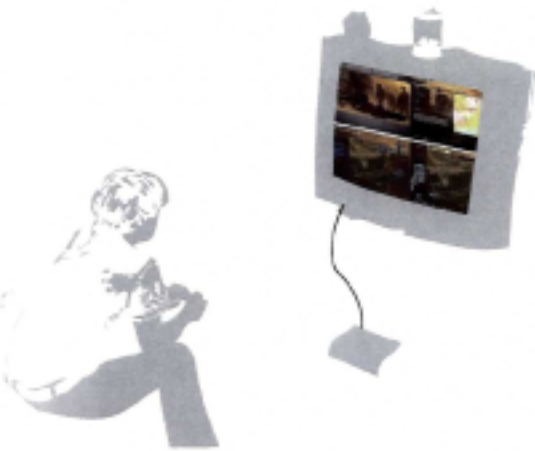
games: Special Events designed for military simul and entertainment. Airsoft enthusiast team public use



- **tracker:** military soldier in training
- **target:** virtual images on a screen
- **interface:** gun - screen - physical props



screen captures from the JFETS Urban Terrain Module installed at Fort Sill, Oklahoma where it has trained over 5,000 soldiers since 2004



www.pandemicstudios.com



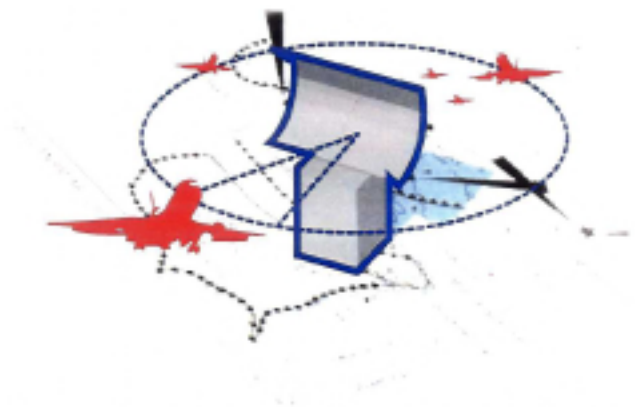
AIRSOFT TECHNOLOGY

"Airsoft guns are frequently used to train soldiers and officers in the army and in law enforcement, because airsoft guns are very similar to real guns used by these personnel, and in many cases, the size ratio and even weight ratio is 1:1."

SIMULATION GAMING

middle:
JFETS [Joint Fires and Effects Training System] recreates life-like environments that place soldiers in real world settings. Stressors include heat, wind, explosions, human distress noise, and snipers.

bottom:
Full Spectrum Warrior a tactical gaming tool originally developed by Pandemic Studios LLC. has been slightly reformed and marketed to mass consumer market.



Historical photograph of Sperry ANFPS-35 height finder radar from Montauk Historical Society

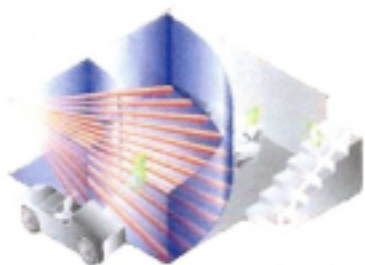


SAGE Human Machine interface circa 1960 from Reinhold Martin's 'The Organizational Complex'



Buckminster Fuller geodesic radome installed at the Defense Early Warning [DEW] line by Western Electric Co. from Reinhold Martin's 'The Organizational Complex'

- tracker: transmitter and receiver
- target: x-y-z position airborne object
- interface: radar screen in command center

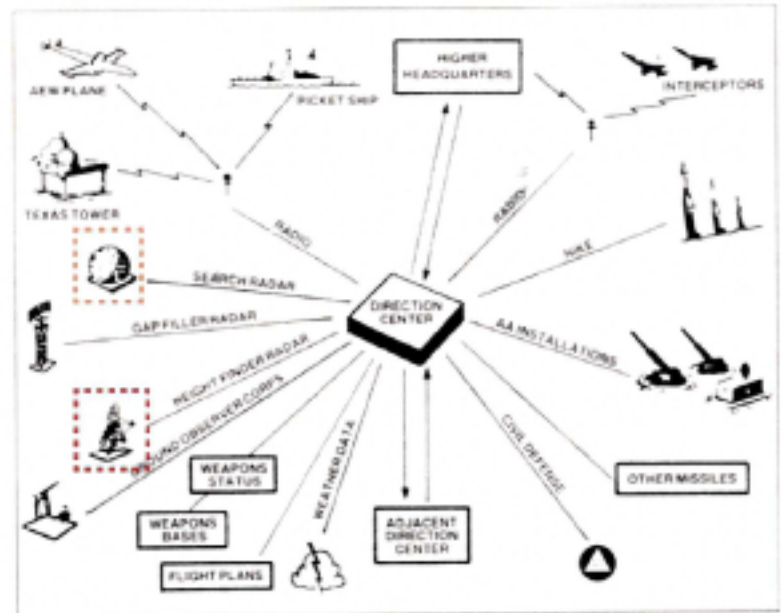


CHALLENGE:

Protect main living area in a residence with a 60 lb dog, two 10 lb cats and stairs in the room.

MISSION ACCOMPLISHED

Precision Line, uses radar technology developed by GE to protect the home from intruders

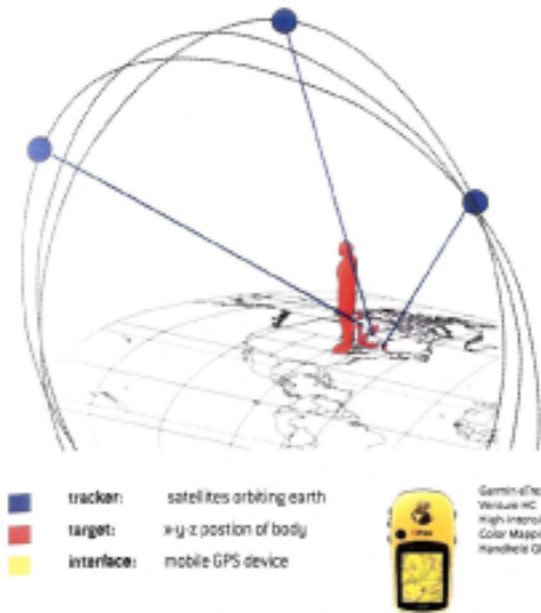


R.A.D.A.R. TECHNOLOGY

Radio detection and ranging transformed the war machine into a space opera; a war that was fought remotely underground in situation rooms. Invisible communication networks replaced physical network of observation towers. The screen detached military personnel from actual events that took place and became the primary means of interface between war opponents. This spatial paradigm of screen as interface between subject and object MIL_CIV immersive surface investigates the opportunities in the interface as a means of networking remote activities

GPS TECHNOLOGY

GPS can simultaneously map an object in space while the object is in motion. Therefore the technology allows the potential for individuals occupy a real time map, where the gap between representation, (the map), and inhabited environment disappears. GPS technology was pioneered by United States Navy in the 1960s to track military weapons and improve missile guidance. In 1983 GPS technology was officially demilitarized and available for civilian use. Popular applications today are recreational such aiding in hiking and driving.



third prototype satellite in the Navstar/GPS constellation from <http://www.aero.org>



rendering of a Navstar/ GPS satellite from <http://www.aero.org>



Engineers from Aerospace and Grumman in 1972, testing a transmitter for the 6218 Defense Navigation Satellite system at White Sands Missile Range, New Mexico, from <http://www.aero.org>





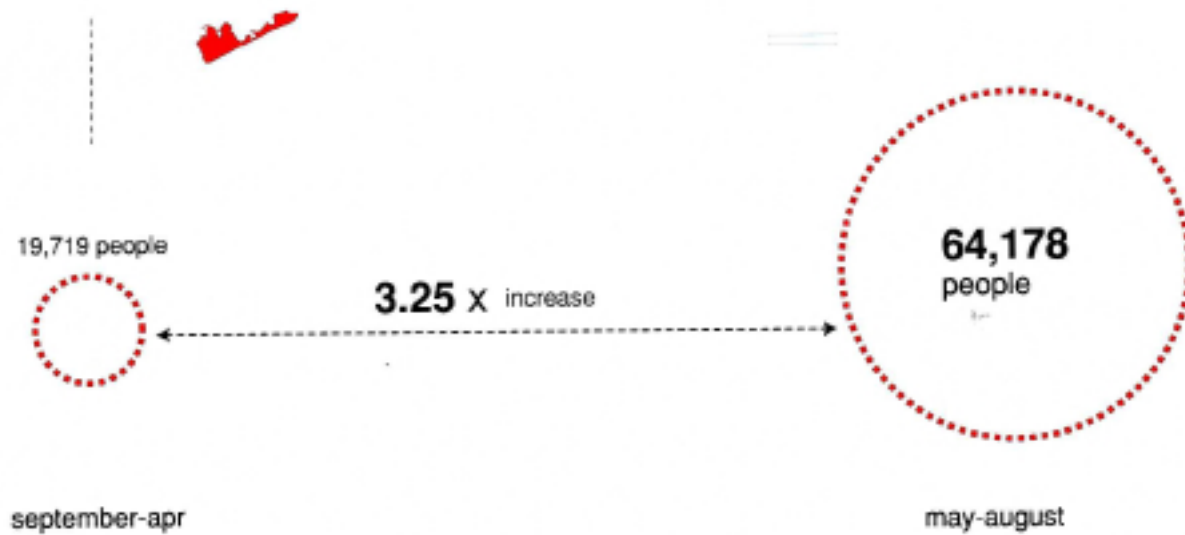
Geo-caching
type of treasure hunt where participants search for hidden caches using hand held GPS devices.

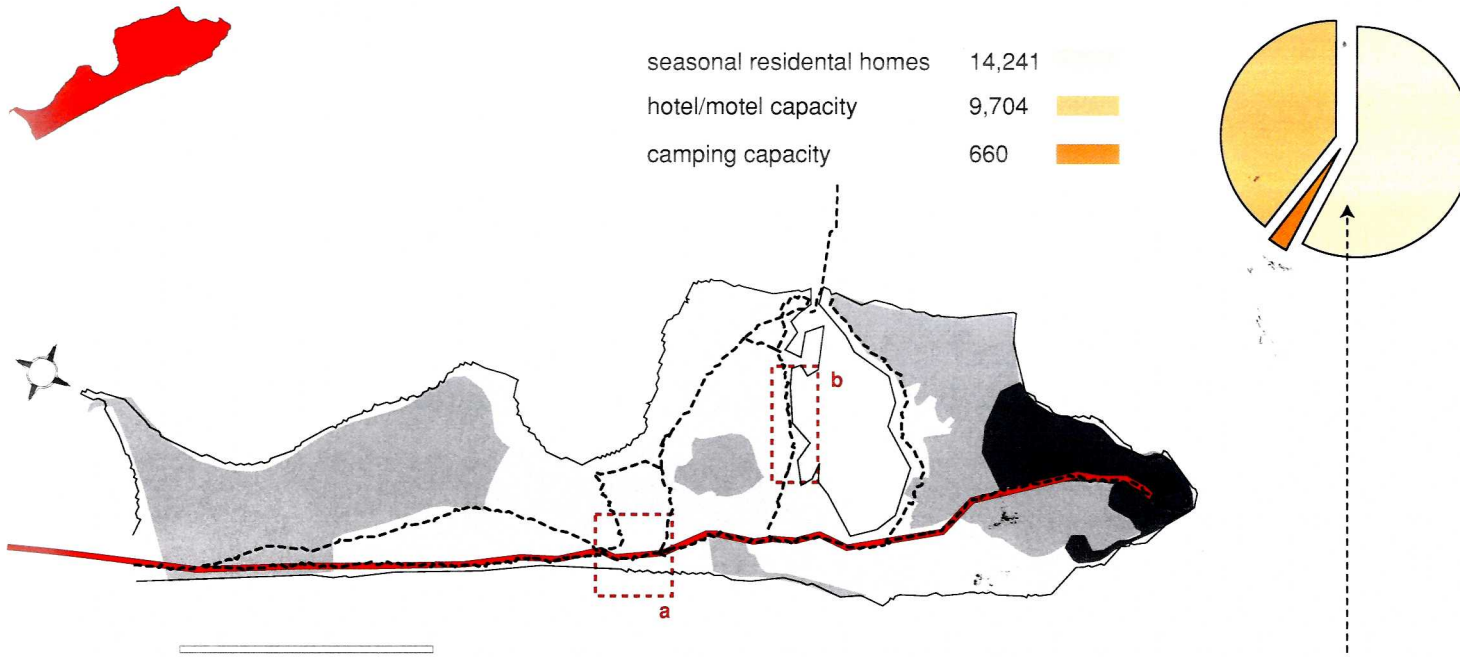


"2003 1/4 of all rental vehicles at US agencies used some form of GPS tracking; not only for driver location but also for the rental agency to know where the car has traveled and its speed."

-Dennis, Kingsley, Global Gridlock: How the US Military Industrial Complex Seeks to Contain and Control the Earth and Its Ecosystems, April 2, 2008 Centre for Global Research www.globalresearch.org

sag harbor	948	2,145	
wainscott	628	2,353	
east hampton village	1,334	5,583	
northwest harbor	3,059	9,851	
amagansett	1,067	6,004	
napeague	223	3,315	
montauk	3,851	26,995	





POPULATION INFLUX

Montauk is one of 7 villages a part of East Hampton and the exorbitant influx of tourists from May to August puts a significant stress on the infrastructure, [utilities, transportation, services], on the island. Therefore, the MIL-CIV immersive surface will be flexible enough to adapt to these drastic changes in density from summer to winter.

3,851 people



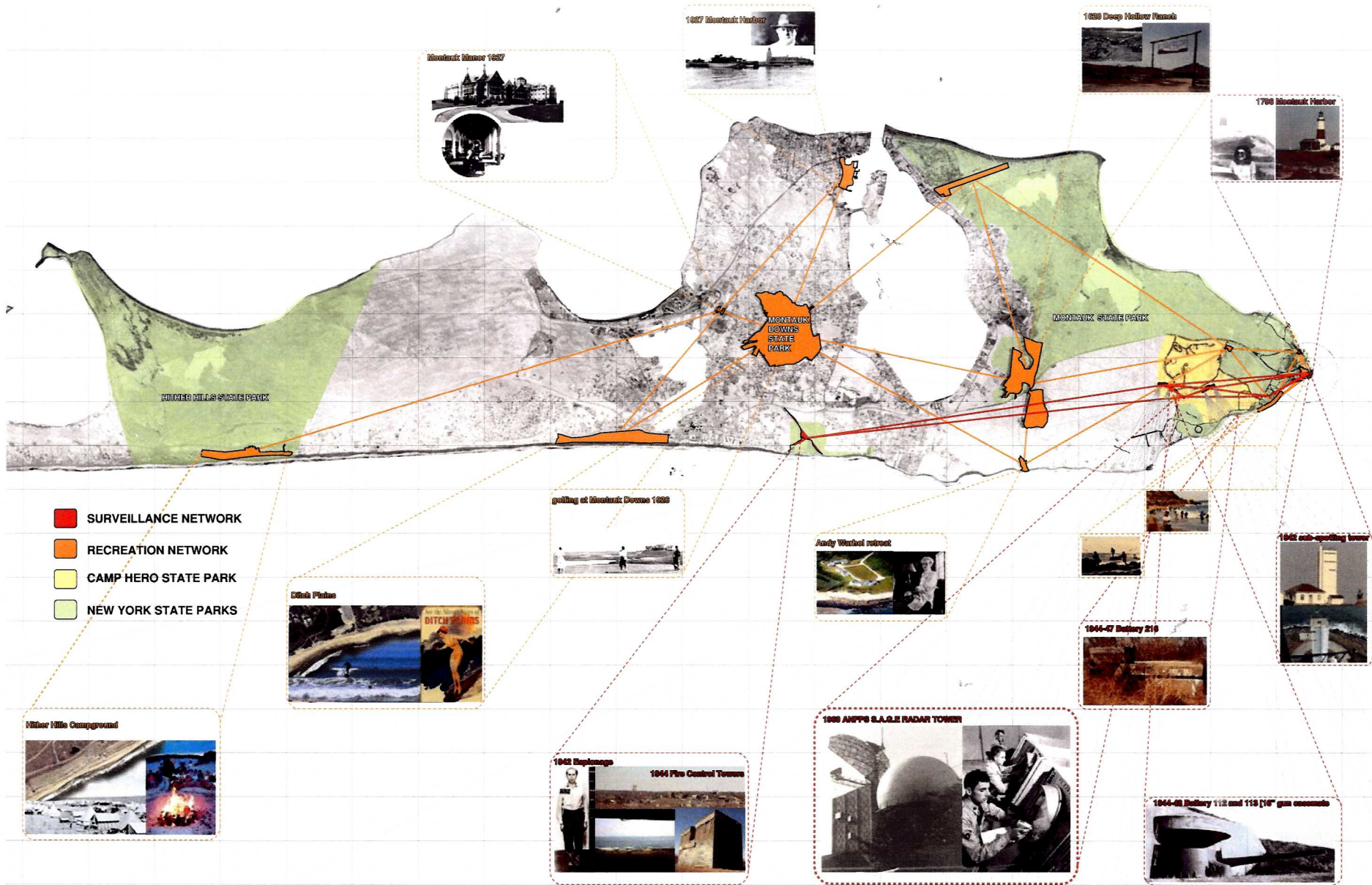
7 x increase

26,995
people

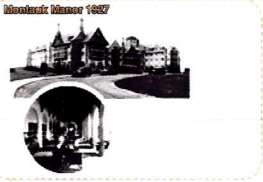
september-april

may-august

Majority of Montauk vacationers rent private homes, but there is still a huge demand for young adults and families to camp at Hither Hills or book hotel rooms. Camping on the beach is very popular and campers must make reservations up to one year in advance. This 7-fold increase in population over the summer transforms Montauk into a very dense summer destination.



- SURVEILLANCE NETWORK
- RECREATION NETWORK
- CAMP HERO STATE PARK
- NEW YORK STATE PARKS



HIGHER HILLS STATE PARK

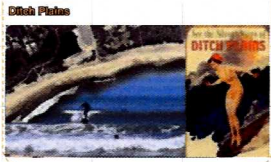
MONTAUK
DOWNS
STATE
PARK

MONTAUK STATE PARK

going at Montauk Downs 1898



Andy Warhol retreat



Mitner Villa Campground



1948 AMPPS S.A.S.E. RADAR TOWER



1944-47 Battery 216

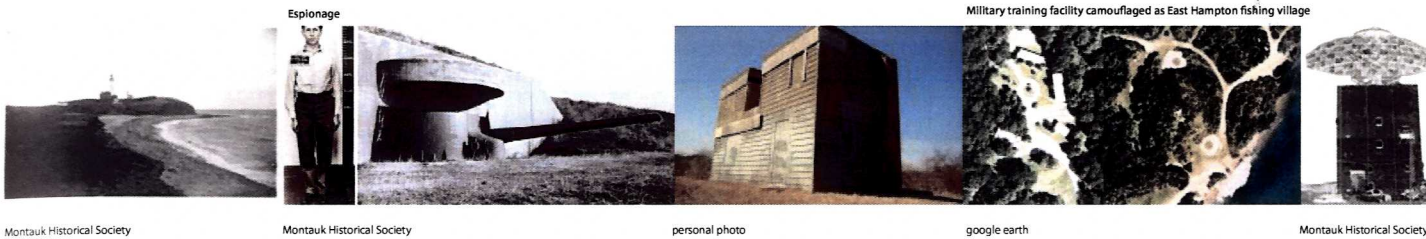


1942 anti-aircraft tower



1944-48 Battery 112 and 118 16\"/>





Montauk Historical Society

Espionage

Montauk Historical Society

Military training facility camouflaged as East Hampton fishing village

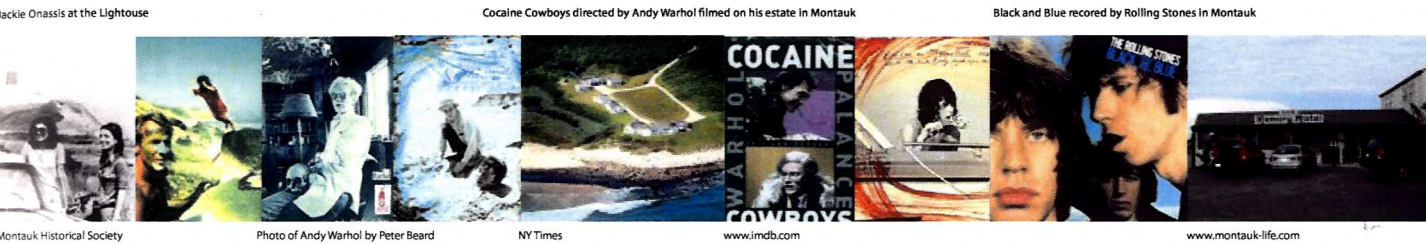
personal photo

google earth

Montauk Historical Society

MONTAUK'S MILITARY & LIESURE HISTORY

Montauk's history of surveillance ranges from the 1729 lighthouse to the 180' Sage Radar tower erected in 1960 for the Cold War.



Jackie Onassis at the Lighthouse

Cocaine Cowboys directed by Andy Warhol filmed on his estate in Montauk

Black and Blue recored by Rolling Stones in Montauk

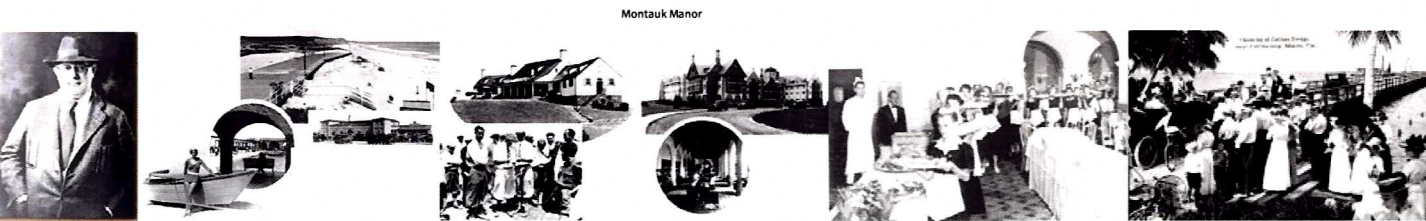
Montauk Historical Society

Photo of Andy Warhol by Peter Beard

NY Times

www.imdb.com

www.montauk-life.com



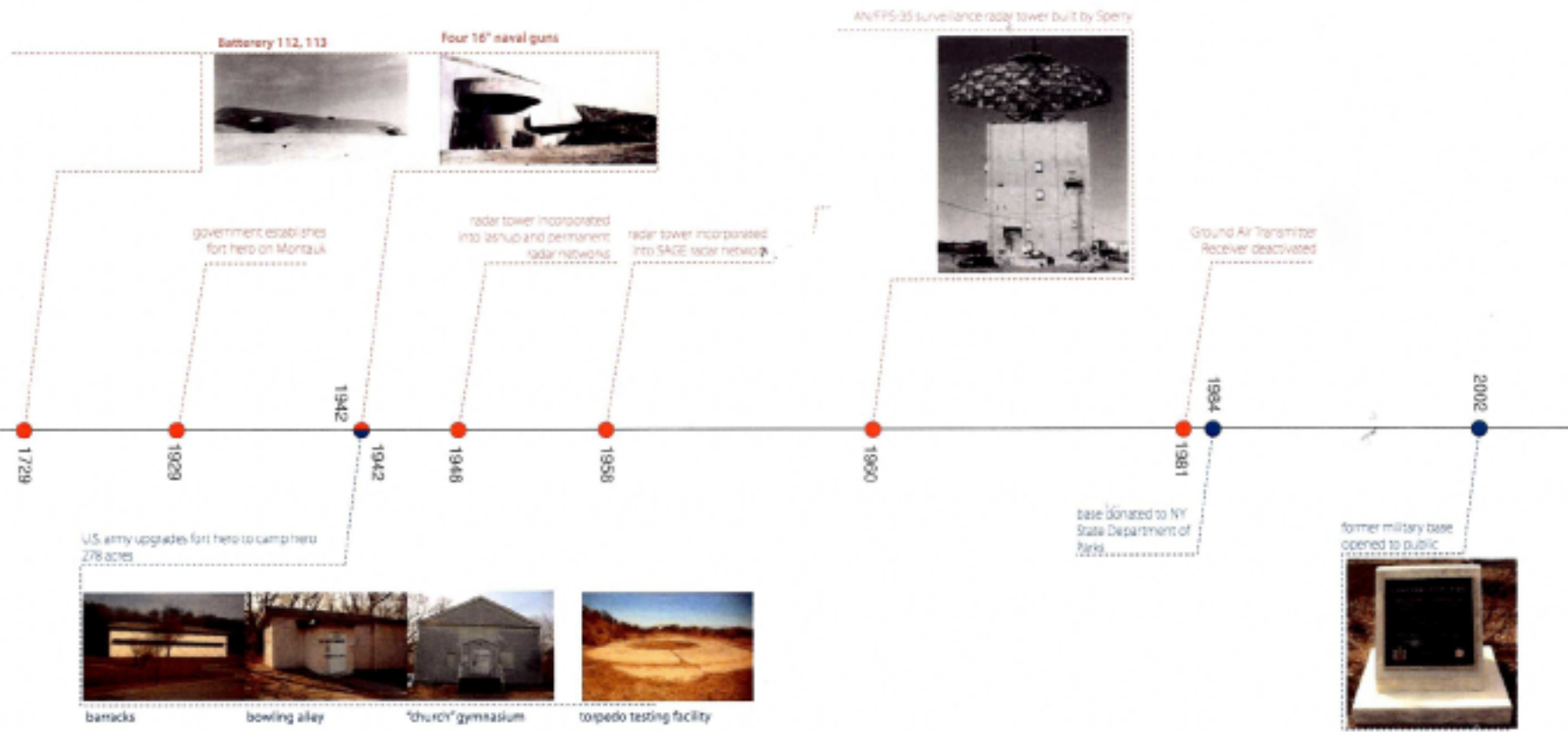
Montauk Manor

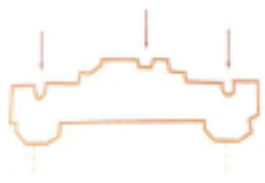
All photos from Montauk Historical Society

Paralell to the development of surveillance installations were recreational experments and trends which began with Karl Fisher's development of Montauk as a resort during the roaring 20s. During World War II much of the infrastructure and hotels were appropriated by the Navy. Today it is popular getaway for east coast urbanites.

Montauk is known for good surf spots and surf/deep sea fishing which draw a large number of locals to "the end" especially in the summer.

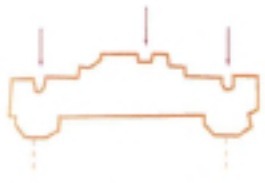
↑ surveillance-observation-spectate





battery 112

77,500 sqft.



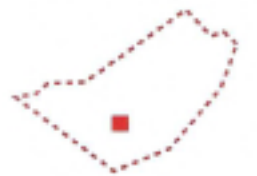
battery 113

77,500 sqft.



east hampton
affordable housing

29 acres



cold war SAGE radar
antennae



WWII camouflage tow

2.8 acres



MONTAUK'S MILITARY & LIESURE HISTORY

Montauk's lighthouse built in 1796 under George Washington is the first instance of tracking on the site. Training and tracking plays out up until the end of the Cold War when the radar antennae was disabled. Camp Hero was closed from 1980 until 2002 when the base was officially declared a New York State Park.

Left:

Timeline of military artifacts on former Camp Hero Military Base.

Right:

Photos and scale of historic artifacts.

MARINE INTERTIDAL



1. Marine intertidal mudflats: a community of quiet waters, with substrates composed of silt or sand that is rich in organic matter and poorly drained at low tide. The substrate may be covered with algae.

2. Marine intertidal gravel/sand beach: a community washed by rough, high-energy waves, with sand or gravel substrates that are well-drained at low tide. These areas are subject to high fluctuations in salinity and moisture.

3. Marine rocky intertidal: a community inhabiting rocky shores that are washed by rough, high-energy ocean waves. Characteristic organisms are attached algae, mussels, starfish, urchins, and barnacles that can withstand the impact of the waves and periodic desiccation. The community is typically rich in species. Usually more than 60% of the substrate is covered by attached organisms.

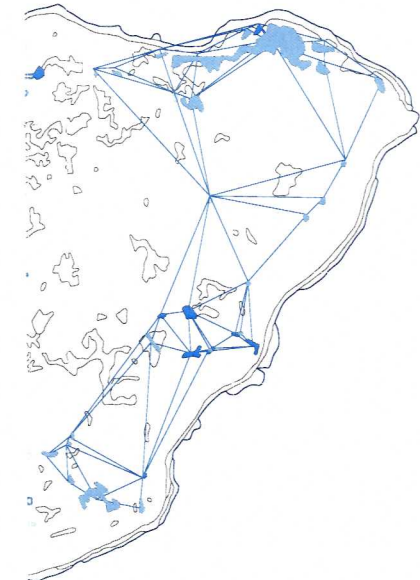


PALUSTRINE EMERGENT



1. Deep emergent marsh: a marsh community that occurs on mineral soils or fine-grained organic soils (muck or well-decomposed peat); the substrate is flooded by waters that are not subject to violent wave action.

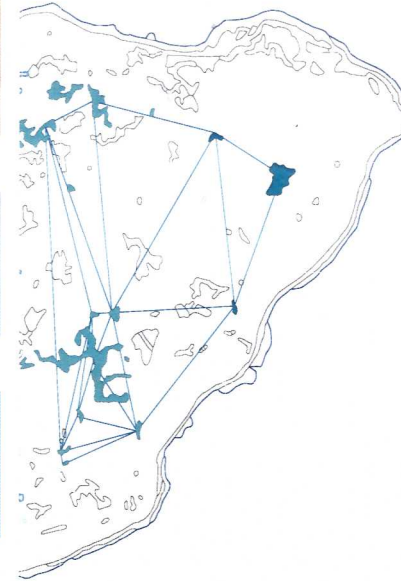
2. Shallow emergent marsh: a marsh meadow community that occurs on mineral soil or deep muck soils (rather than true peat), that are permanently saturated and seasonally flooded. This marsh is better drained than a deep emergent marsh.



PALUSTRINE SCRUB-SHRUB

3. Shrub swamp: an inland wetland dominated by tall shrubs that occurs along the shore of a lake or river, in a wet depression or valley not associated with lakes, or as a transition zone between a marsh, fen, or bog and a swamp or upland community. The substrate is usually mineral soil or muck. This is a very broadly defined type that includes several distinct communities and many intermediates.

11. Pine barrens shrub swamp: a shrub-dominated wetland that occurs in shallow depressions in the coastal plain, often as a linear transition zone between a coastal plain pond shore and either pitch pine-scrub oak barrens or pitch pine-oak forest.



[IN]TRINSIC
TRAJECTORIES

03

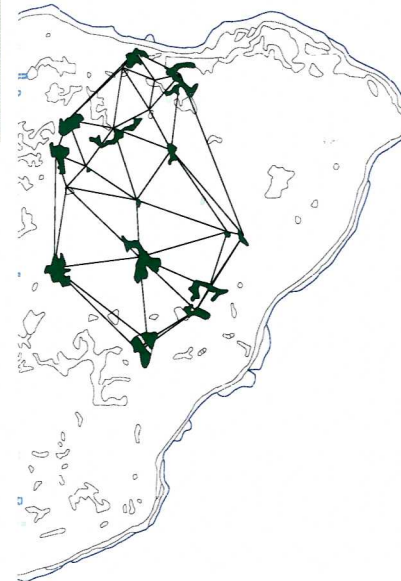
MONTAUK'S BIRD HABITATION & MIGRATION

Montauk has a diverse maritime habitat, and due to the fact that over 60% of Montauk is apart of the New York State Park system it is quite active. The wetland habitats host a regional bird population as well as migrant bird population.

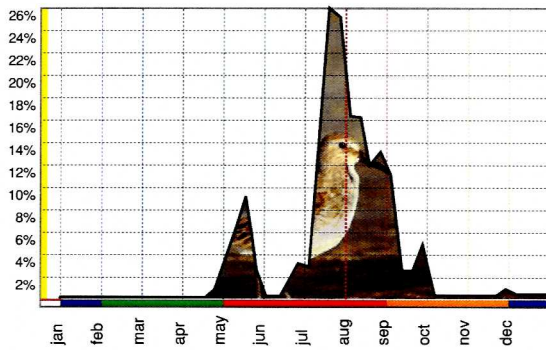
Montauk is an important stop for many birds breeding in Canada during the summer and migrating to South America for the winter.

PALUSTRINE FORESTED

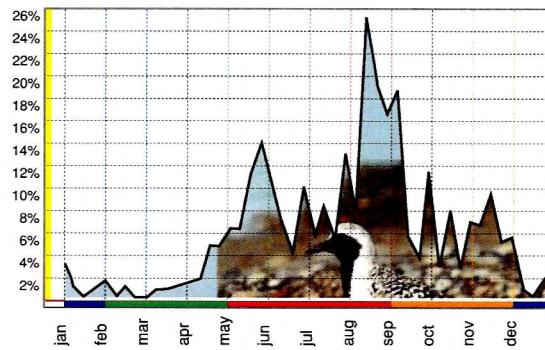
Atlantic White Cedar Swamps: The soils in these forested wetlands are semi-permanently or seasonally flooded in lowland areas, or saturated. If the tree layer is mixed with other species, greater diversity is found in the shrub and herb layer.



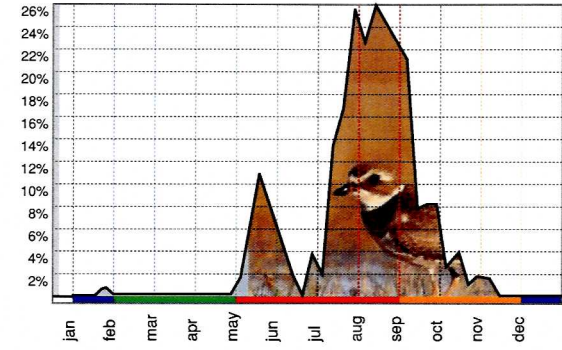
SEMI-PALMATED PLOVER



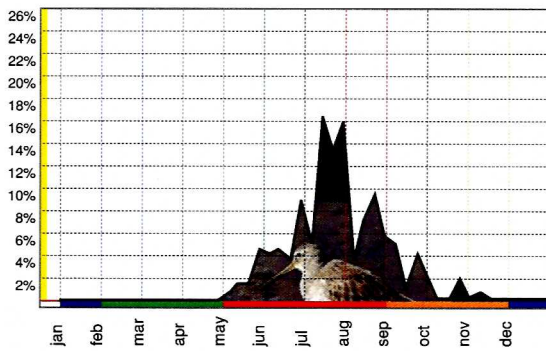
BLACK BELLED PLOVER



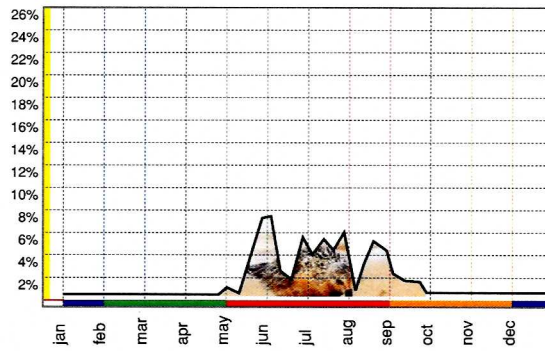
RUDDY TURNSTONE



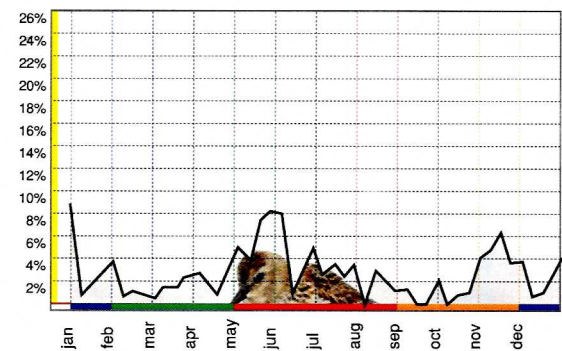
DOWITCHER

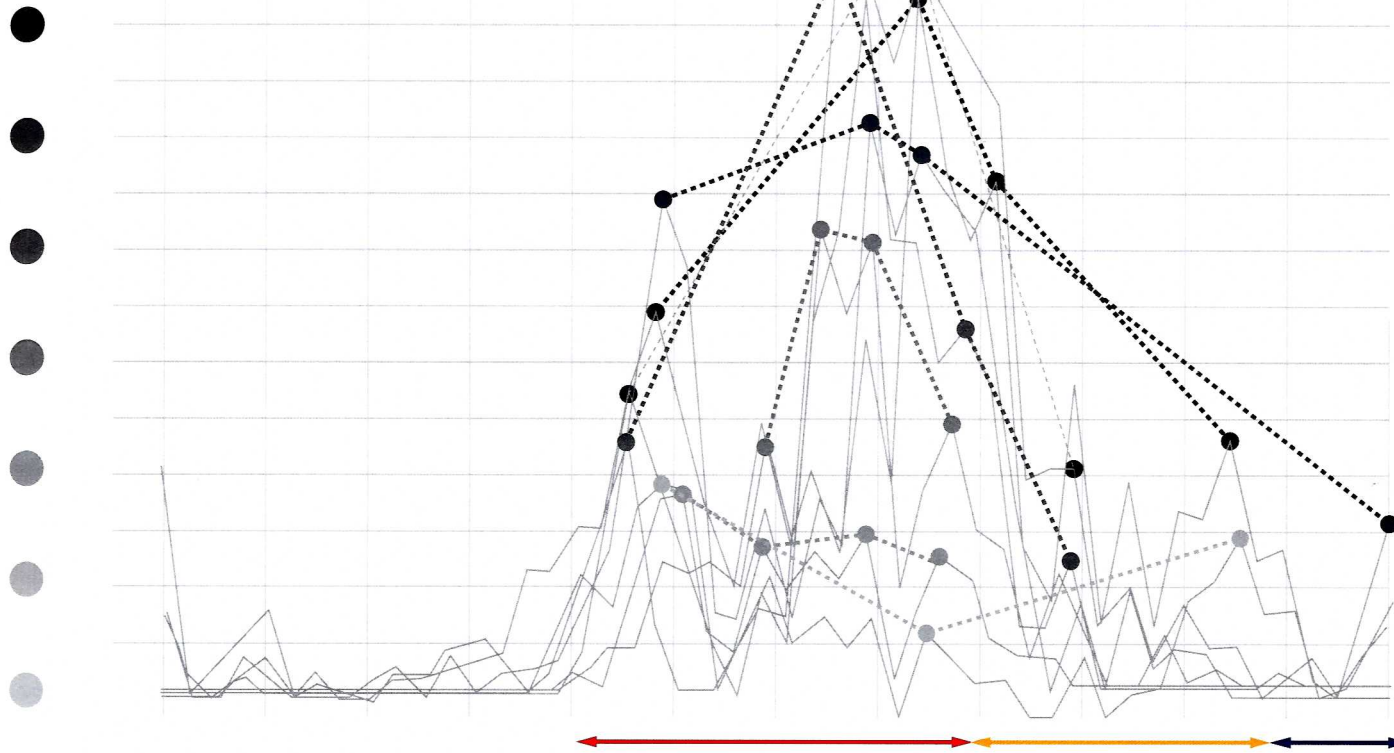


RED KNOT



DUNLIN





MONTAUK'S BIRD HABITATION & MIGRATION

The Cape May Bird Observatory in New Jersey in conjunction with Cornell's Ornithology Lab map bird migration along the East Coast from the northern region of Canada down to Central and South America.

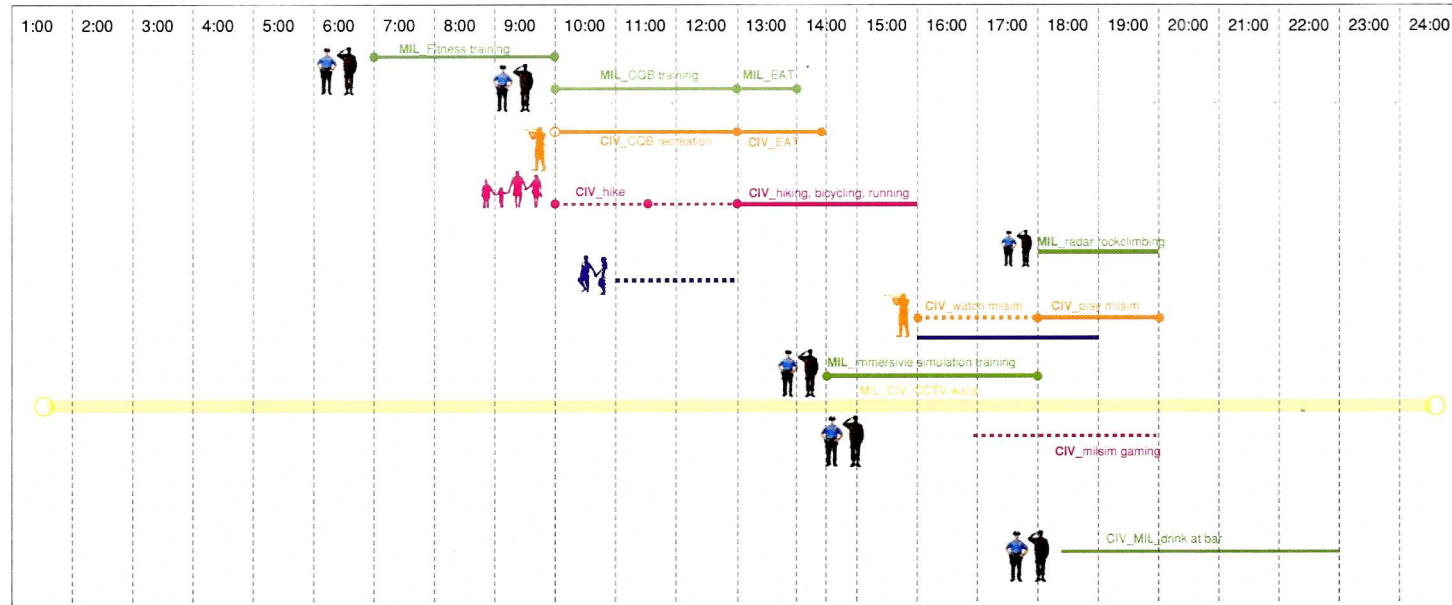
Left:
Seasonal distribution of birds seen migrating along the East Coast.

Right:
Composite diagram shows the optimal bird watch season.

3,851 people

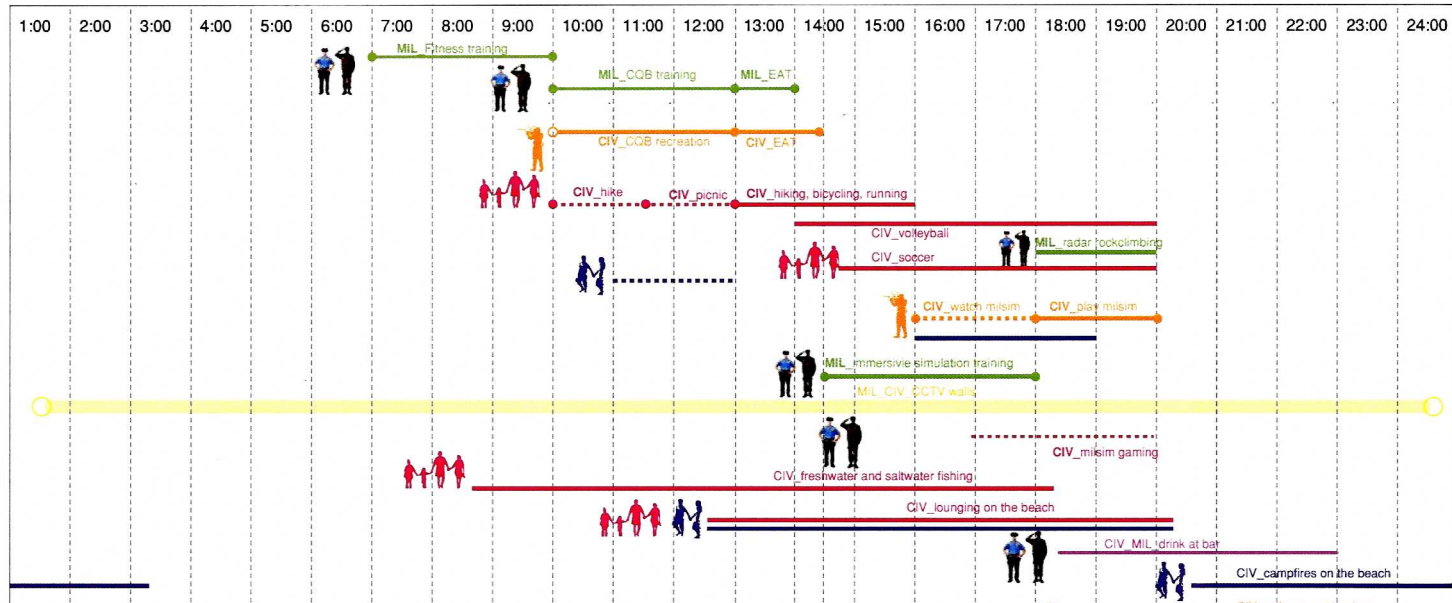


september-april



26,995 people

may-august



10 hours
mil_civ immersive training



mil-sim game enthusiast

- 10:00 staging for Airsoft
- 10:30 Airsoft game
- 12:30 Eat
- 13:30 Target practice
- 14:30 Immersive Simulation Gaming
- 16:00 Watch mil-sim training
- 17:00 Radar roof 'happy hour'
- 20:00 Radar film festival

13 hours
mil_civ immersive training
U.S. army soldier itinerary



- 7:00 fitness training
- 9:00 staging for CQB training
- 9:30 CQB training
- 12:00 Eat
- 13:00 immersive simulation training
- 15:00 Tactical Seminar
- 16:00 Target Practice
- 17:00 Radar rockclimbing
- 20:00 drink and monitoring vacationers
- 20:00 Radar film festival

6 hours
mil_civ immersive recreation



young couple

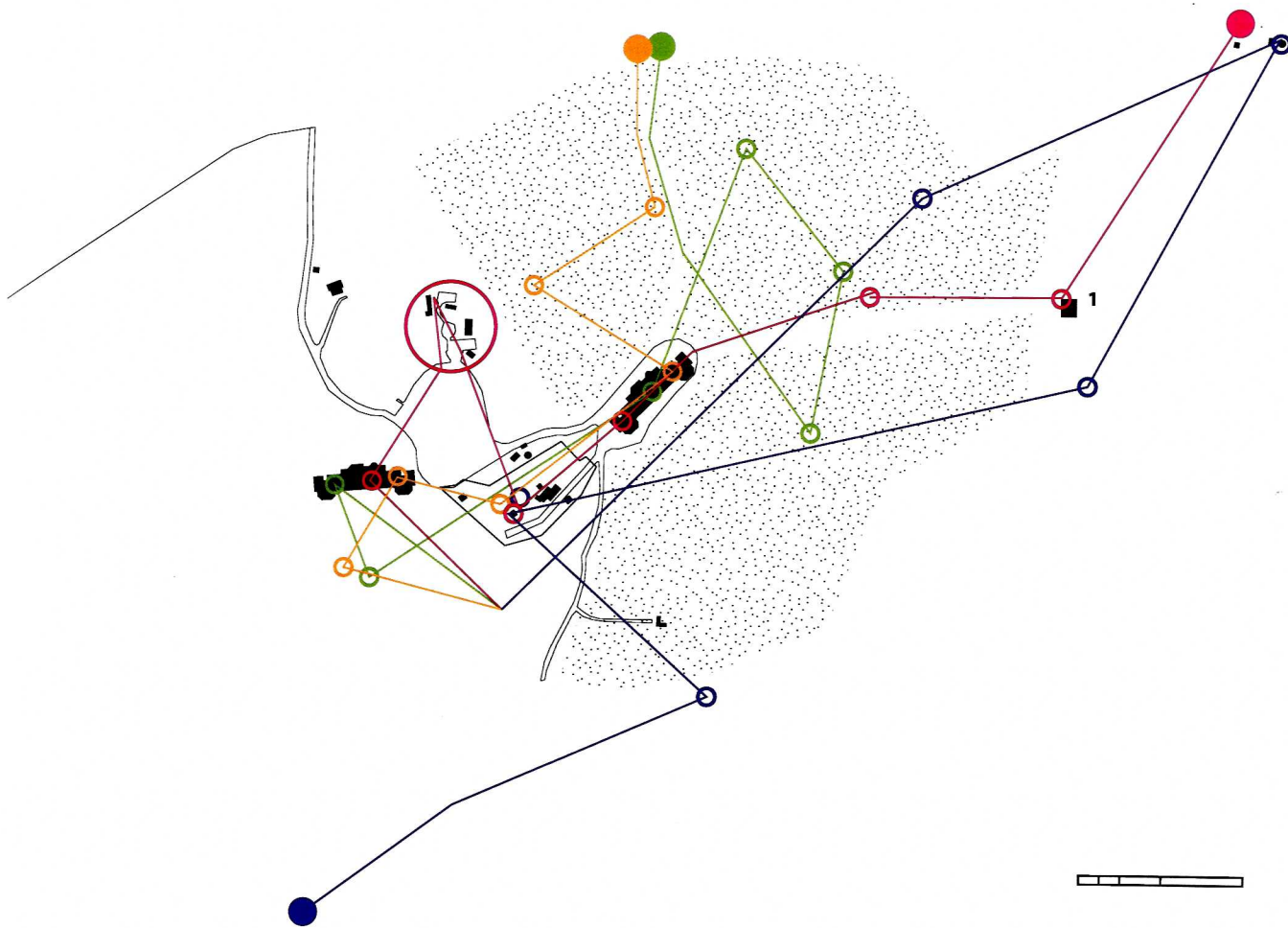
- 11:00 hike to picnic spot
- 12:00 picnic on Battery 112
- 13:00 climb radar tower and watch target practice
- 14:00 play volleyball
- 15:00 hike nature trail
- 17:00 Radar roof 'happy hour'

5 hours
mil_civ immersive recreation



single family vacationers

- 9:00 begin at lighthouse
- 10:00 nature walk
- 11:00 watch military CQB training
- 12:00 eat on battery 113 above mil-sim gaming
- 12:30 begin hiking tour of military industrial complex
- 15:00 play soccer
- 16:00 play family version of MIL_Simulation



MIL-CIV IMMERSION

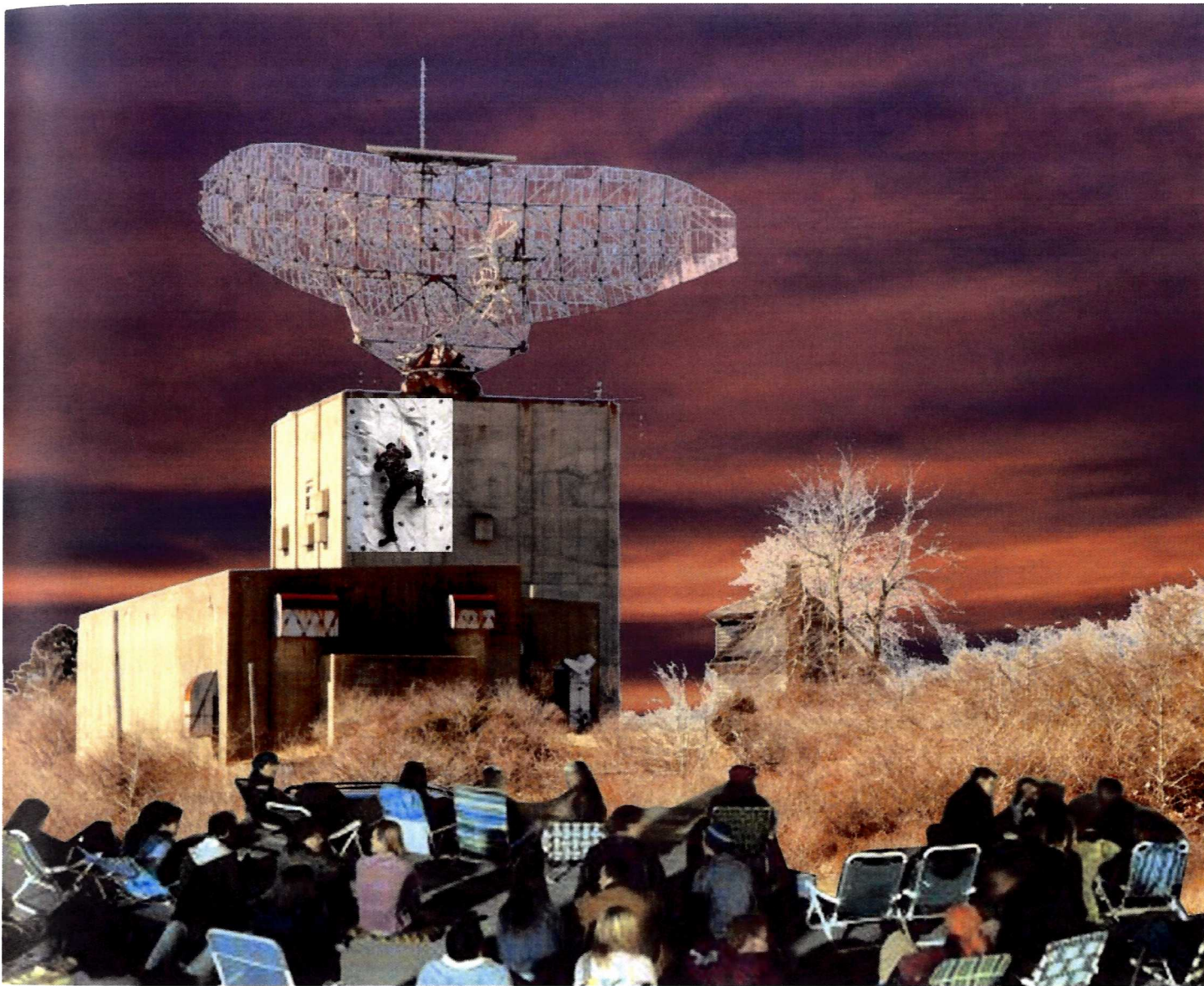
Preliminary design proposal towards the end of Thesis Prep integrating a new military training fields with a recreational program.

Itineraries integrate the relationship between training and recreation to create an immersive experience that isn't just about going to the beach, but about participating in a recreational military experience.

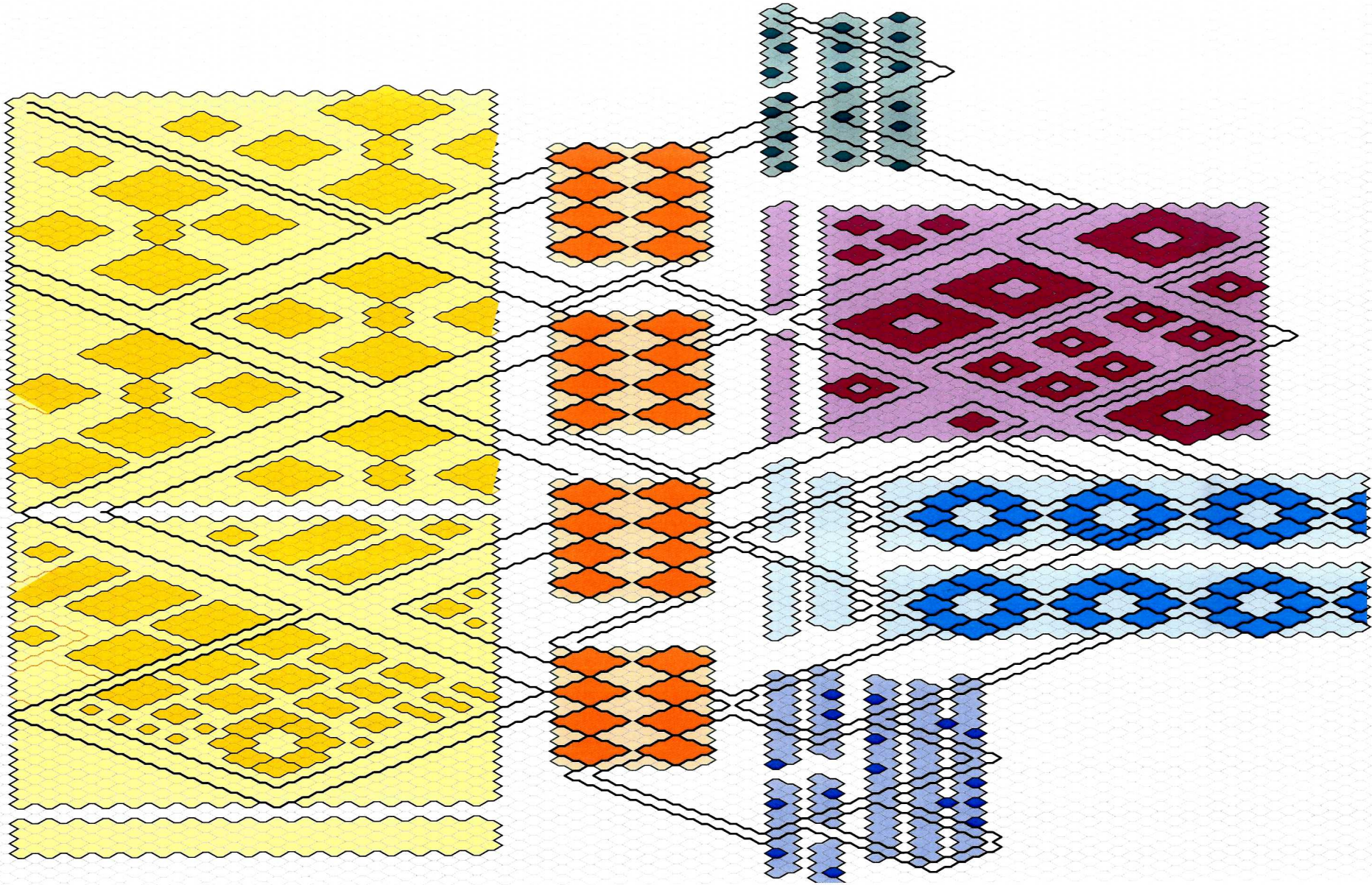
Participants in the MIL_CIV immersive surface range from regional law enforcement and military personnel as well as single family and weekend getaway vacationers.

The sequencing of activities creates juxtapositions and intersections between families and soldiers, CQB training and fishing.

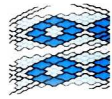


**MIL-CIV** **IMMERSION**

The 4 itineraries signify the different participants in the MIL_CIV surface. Potential sequences are mapped onto the sight. Intersections suggest gathering zones between different participants. Adjacencies suggest passive integration between different activities such as watching and listening. The ideograms diagrammatically image intersection and adjacency.



Military History



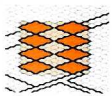
lobby	200 sqft.
storage	200 sqft.
mech/elect	400 sqft.
WWII exhibition	2,600 sqft.
Cold War exhibition	2,600 sqft.
total:	6,000 sqft.

Event Space



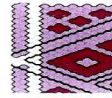
open slope	14,200 sqft.
bench slope	9,800 sqft.
staging area	1,300 sqft.
total:	26,000 sqft.

Service Bar



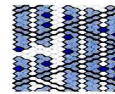
cafe-drinks	1,250 sqft.
restrooms	1,250 sqft.
maintenance	1,250 sqft.
power	1,250 sqft.
total:	5,000 sqft.

Aviary



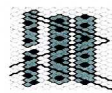
aviary	7,000 sqft.
bird repair	300 sqft.
bird storage	300 sqft.
total:	7,600 sqft.

Bird Observatory



lobby	250 sqft.
meeting room	250 sqft.
administration	125 sqft.
radar imaging	125 sqft.
observation decks	1,250 sqft.
total:	2,000 sqft.

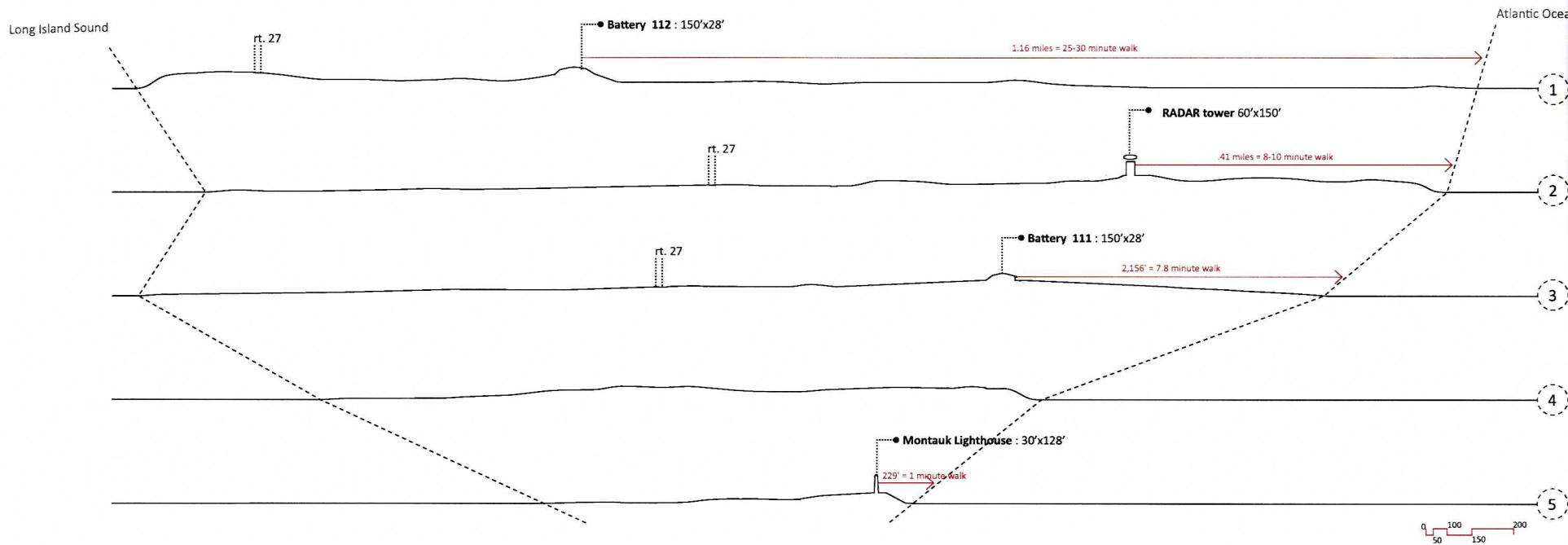
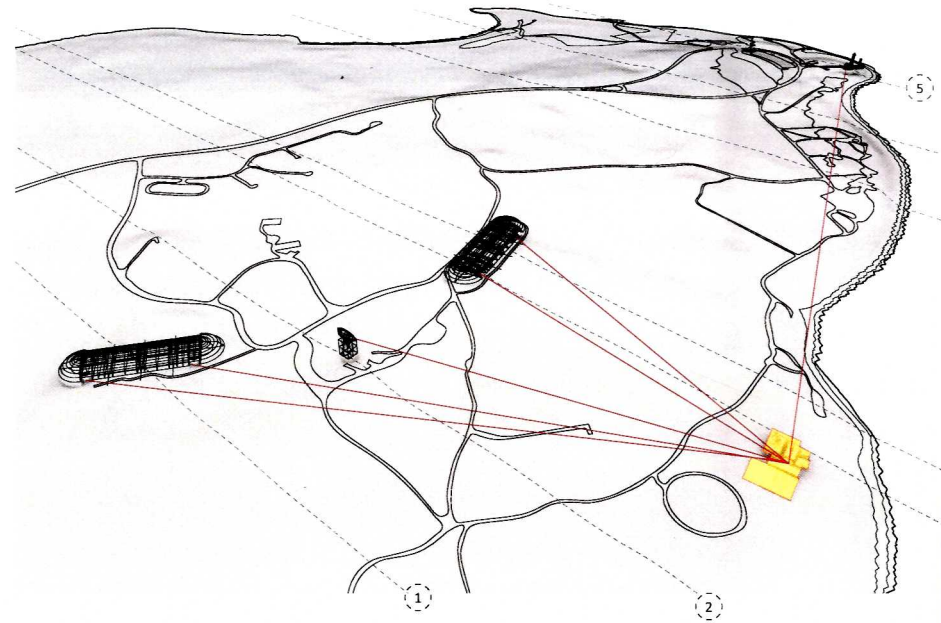
Surf / Kayak / Hike / Fish Outpost

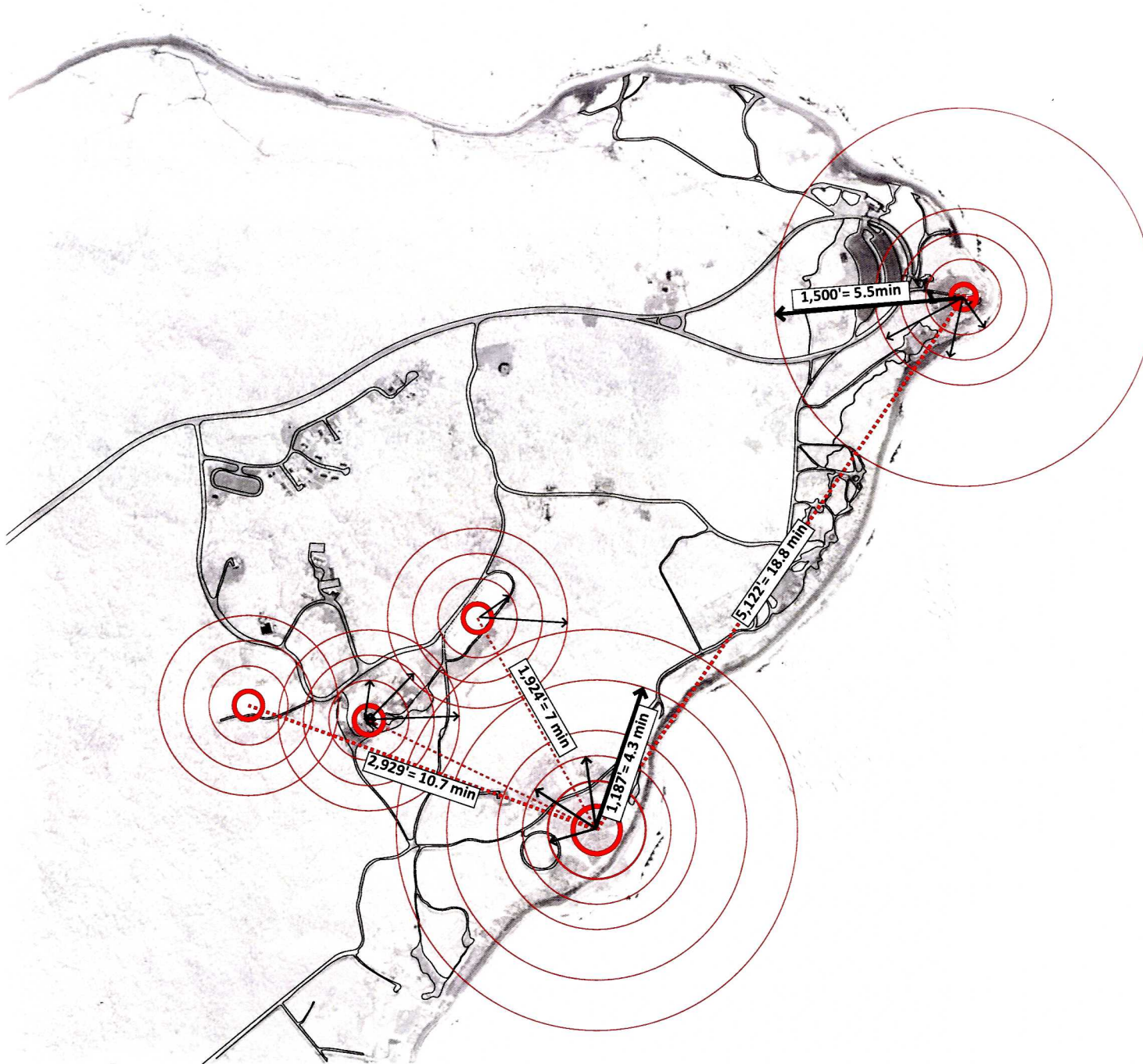


surf / kayak racks	400 sqft.
bike rental	400 sqft.
fishing gear	200 sqft.
hiking gear	200 sqft.
total:	1,200 sqft.

PROGRAMMING OCU-PARK

The cellular pattern sets up a field in which variation in program suggests variation in organizational logic. The abstract diagram below suggests each program has a autonomous logic yet connections are made between them





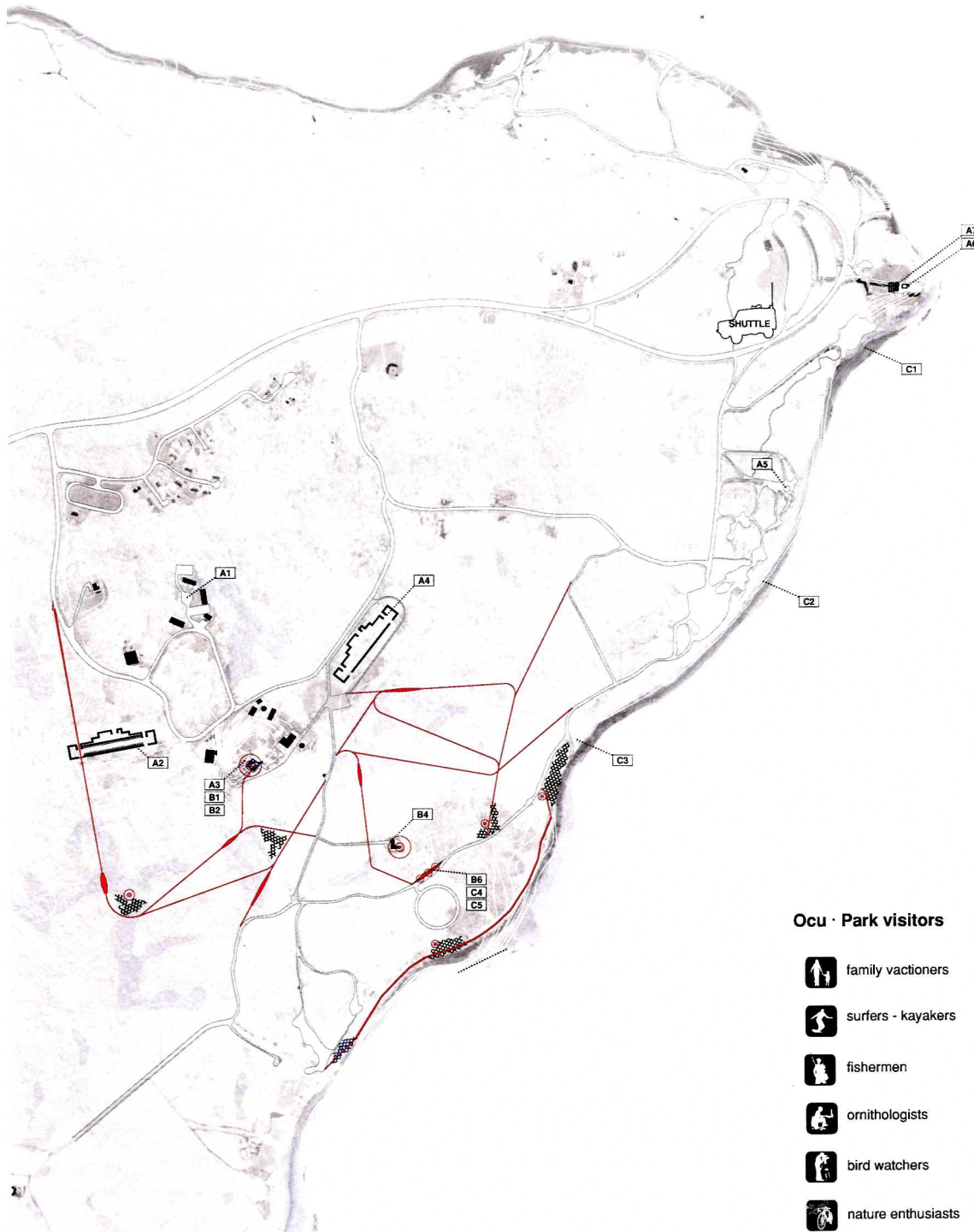
The average human walks 273' per minute

MAPPING &

DISTANCE PROXIMITIES

Left:
serial site sections cut through the southern tip of Long Island diagram the relationship between the water, military artifacts, and Sunrise highway.

Right:
Distances between artifacts become important parameters in determining assembling and connecting existing and proposed program.






Surveillance History Lattice

- A1. Camouflage village
- A2. Battery 112
- A3. ANFPS Radar Tower
- A4. Battery 113
- A5. Battery 216
- A6. Sub-spotting Tower
- A7. Montauk Point Lighthouse



Bird Watching Lattice

- B1. Radar aviary
- B2. Radar rooftop birdwatching
-  B3. Wetland trail system
- B4. NEXRAD image analysis
-  B5. nesting structure-erosion control
-  B6. Record and listen to bird sounds

Ocu · Park visitors

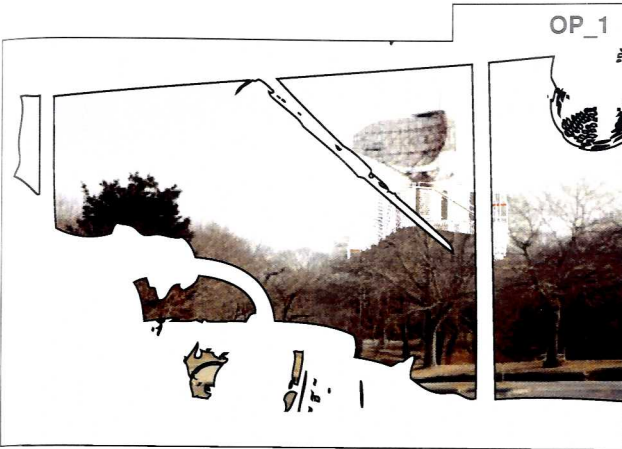
-  family vacationers
-  surfers - kayakers
-  fishermen
-  ornithologists
-  bird watchers
-  nature enthusiasts



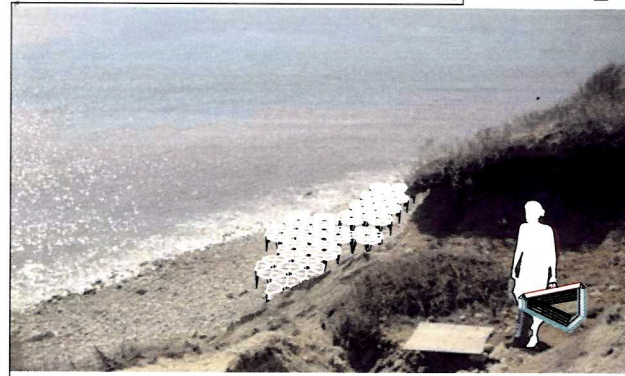
Water Recreation Lattice

- C1. Turtle Cove
- C2. The Browns
- C3. Sewer pipe
- C4. Kayak Surfer bar
- C5. Mobile Lattice

OP_1

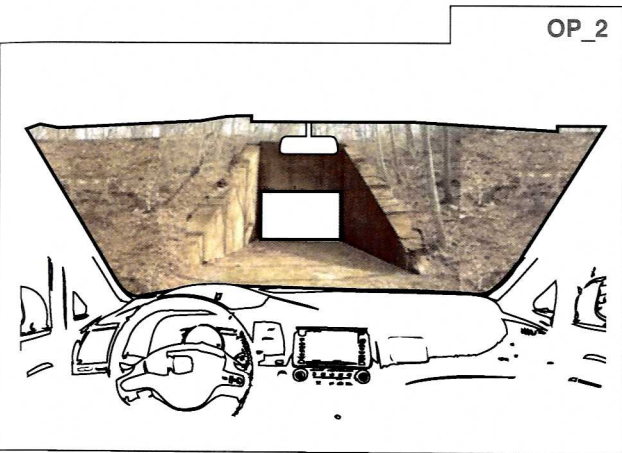


OP_4

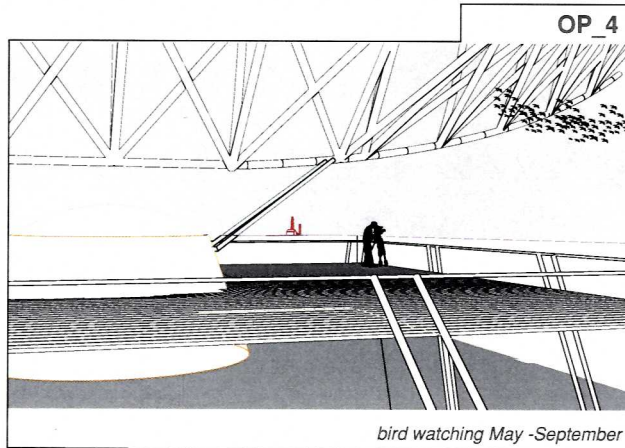


hike down to water with mobile lattice and camp or fish

OP_2

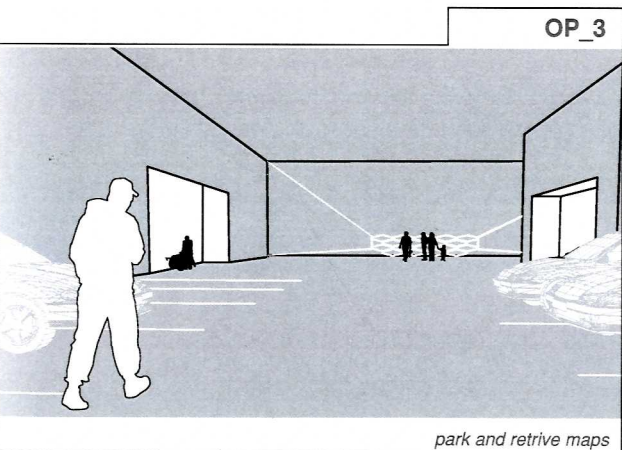


OP_4



bird watching May -September

OP_3



park and retrieve maps

WELCOME TO OCU-PARK

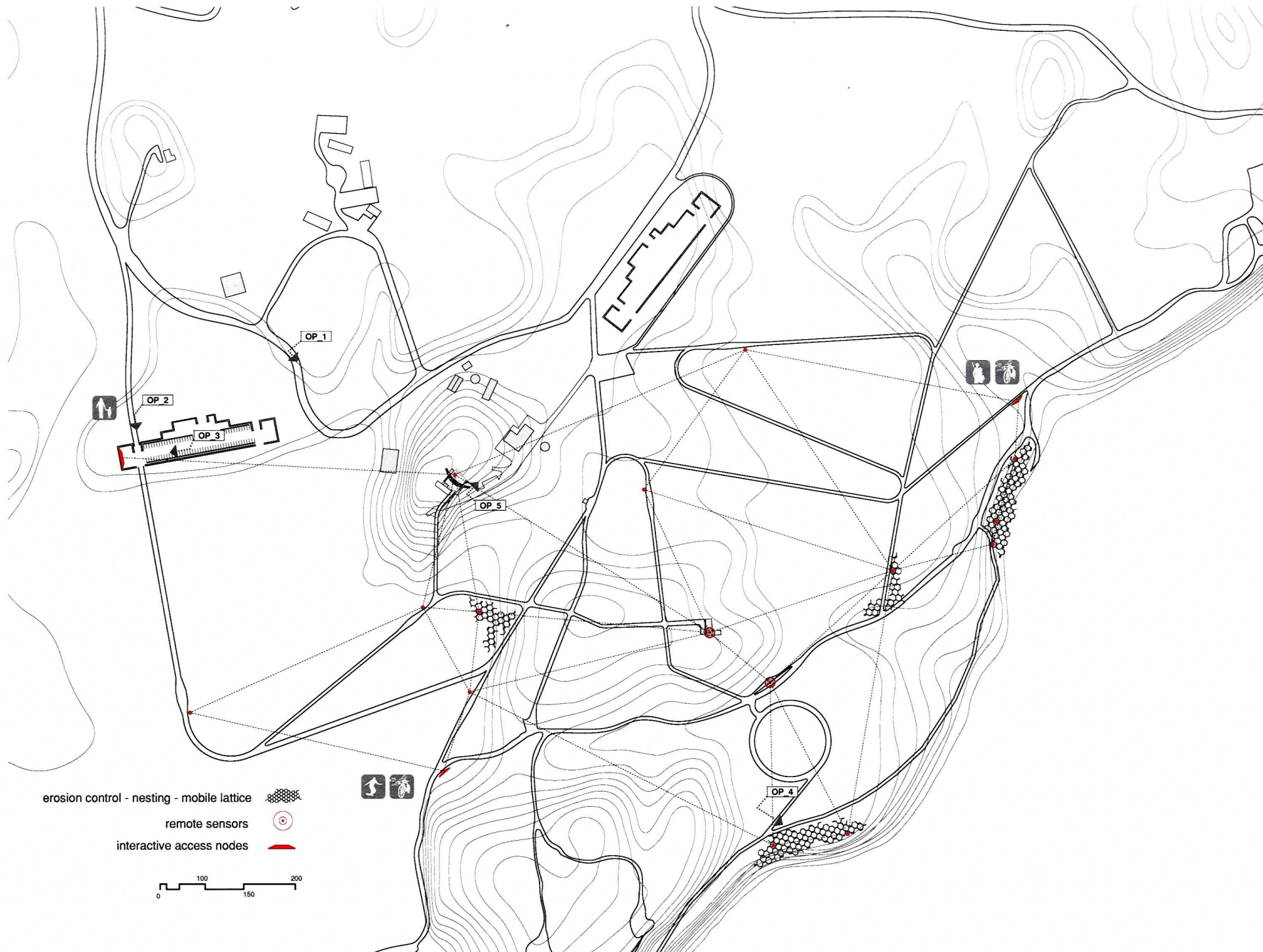
Left:




-An expanded site map of Ocu-Park and its relationship to sunrise highway, and the lighthouse at the very end of Long Island's South Fork.

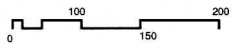
-Existing and proposed recreational and ecological activities are organized by different visitor types.

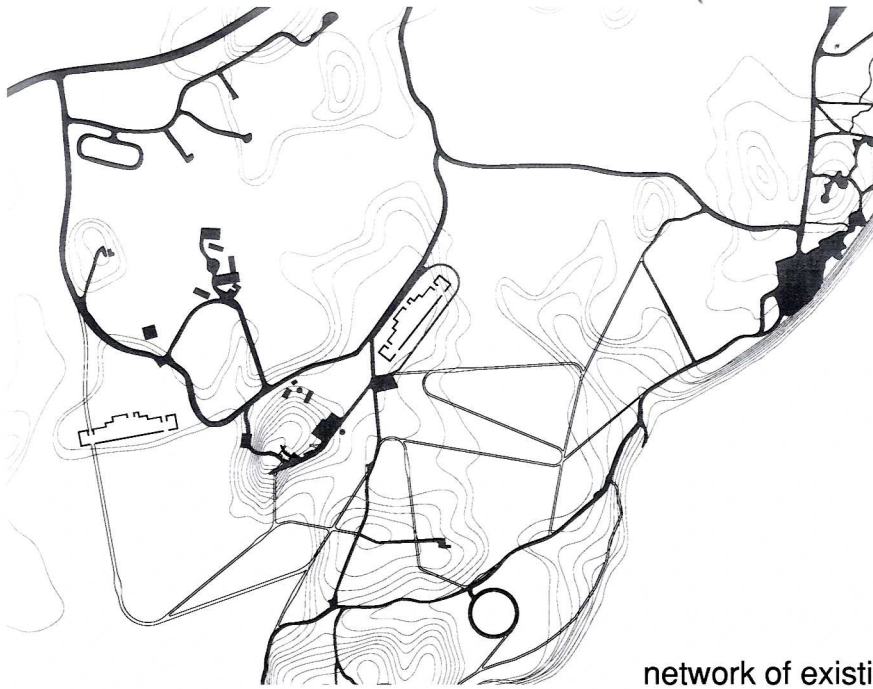
Right:

-Perspectival vignettes keyed into the expanded site map illustrate different access points to Ocu-Park, and the lattice operating at multiple scales ranging from the scale of a mobile camper to bird migration.

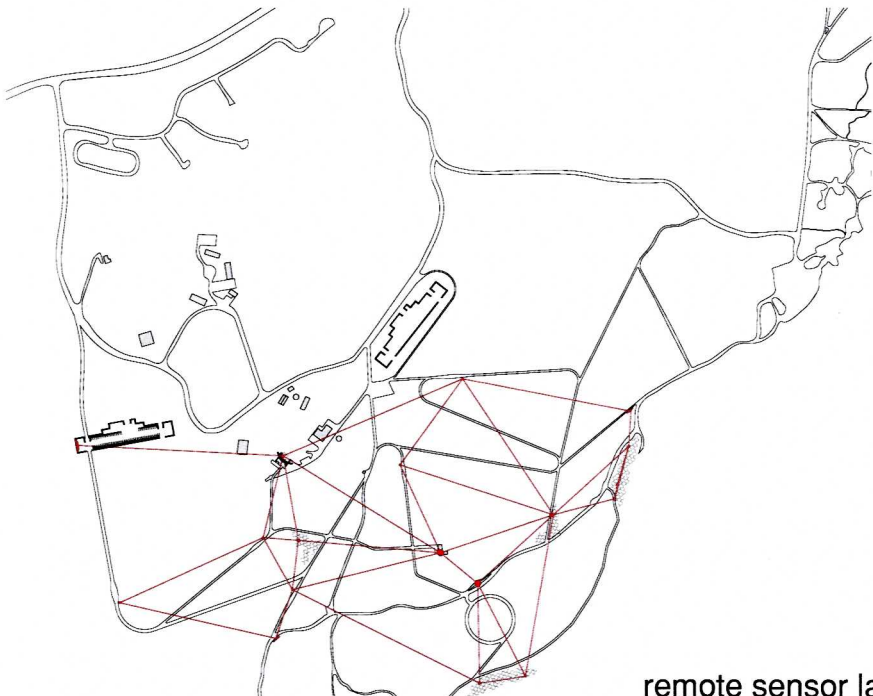


erosion control - nesting - mobile lattice 
remote sensors 
interactive access nodes 





network of existing trails



remote sensor lattice

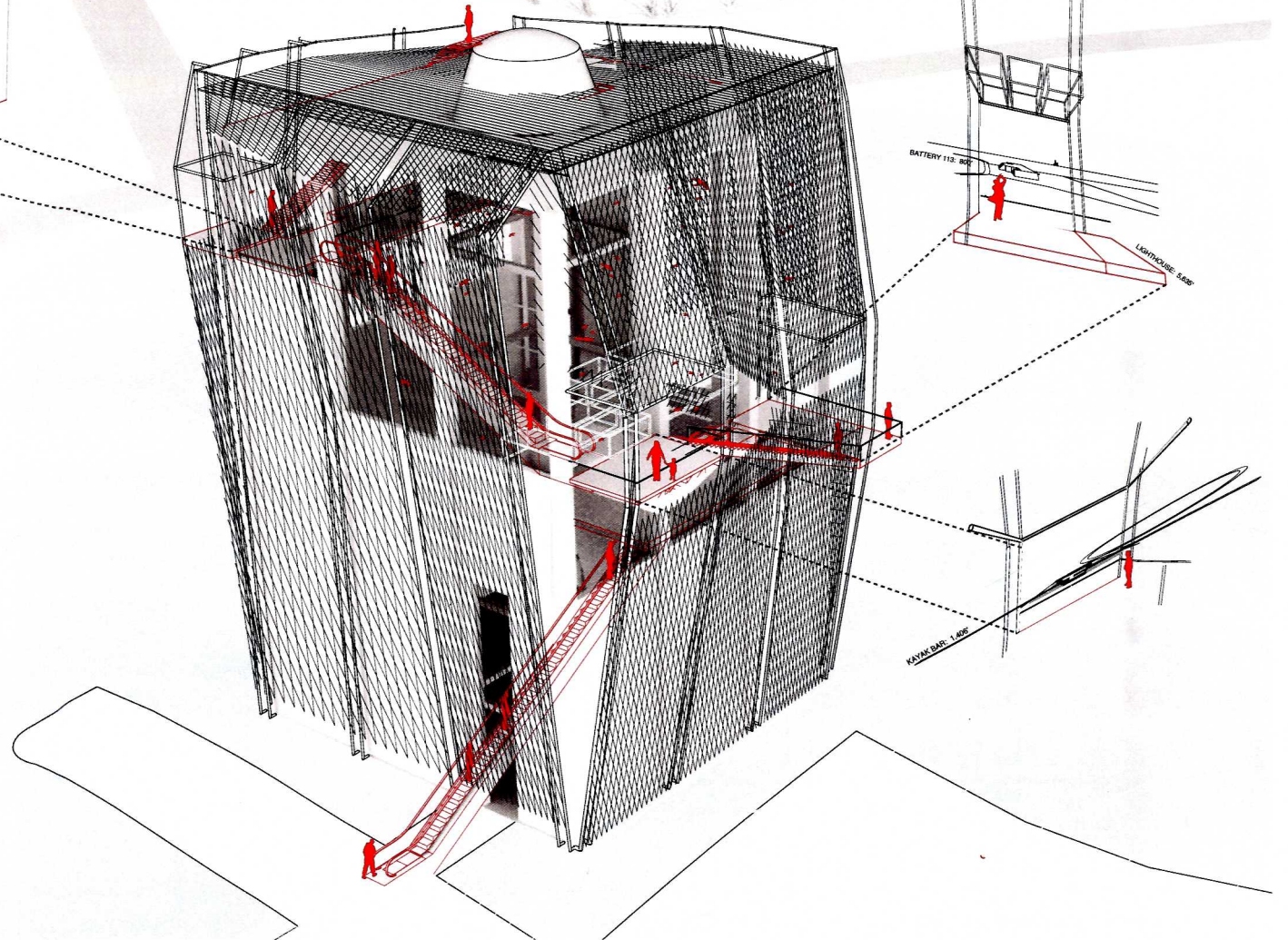
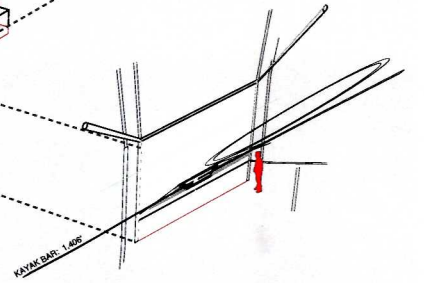
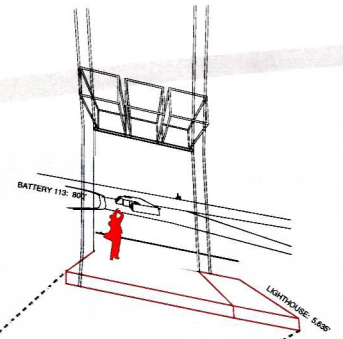
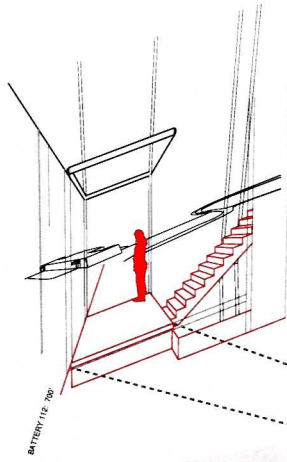
O C U - P A R K

Left:

Site plan of Ocu-Park situating the Ocular Lattice, Kayak bar within new and existing network of nature trails and remote sensors that weave through the different military artifacts and wetland habitats

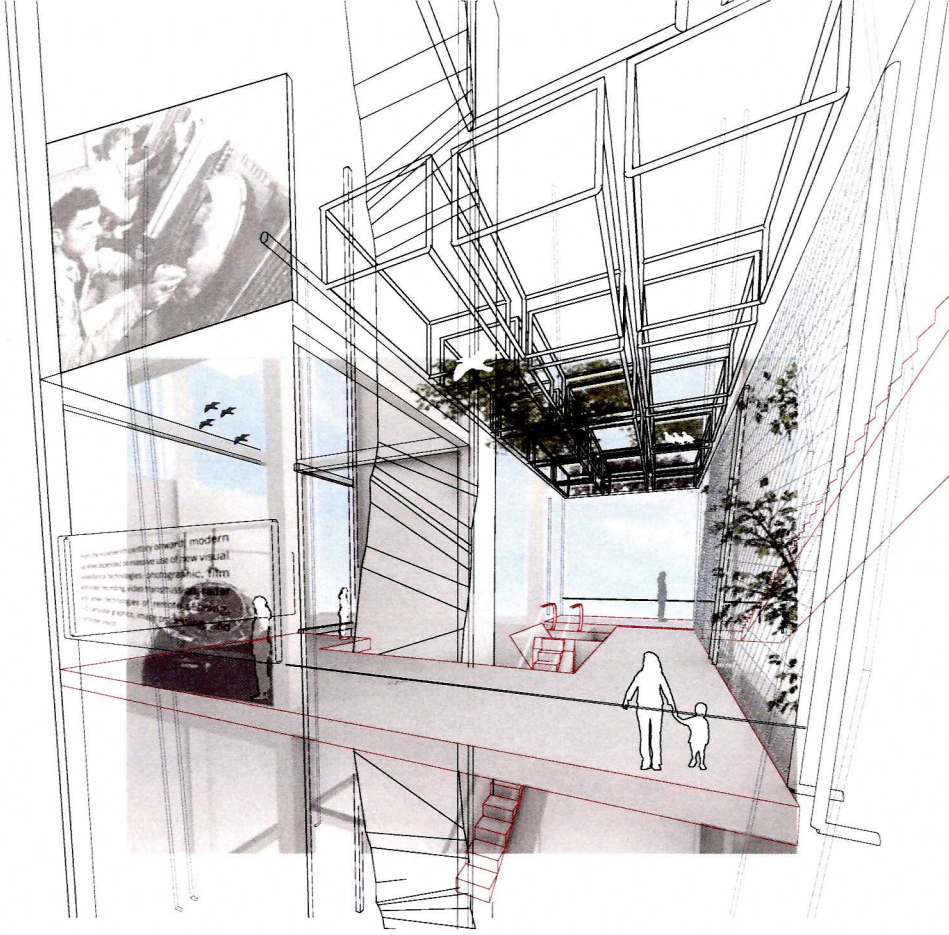
Right:

diagrams highlighting the former Camp Hero network of trails and network of remote sensors that monitor local bird habitats and surfers riding the waves

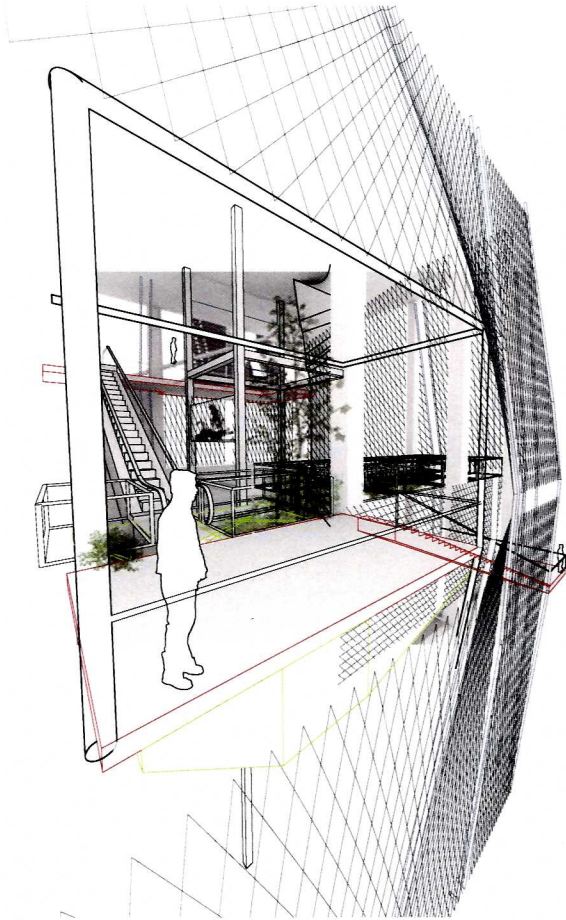




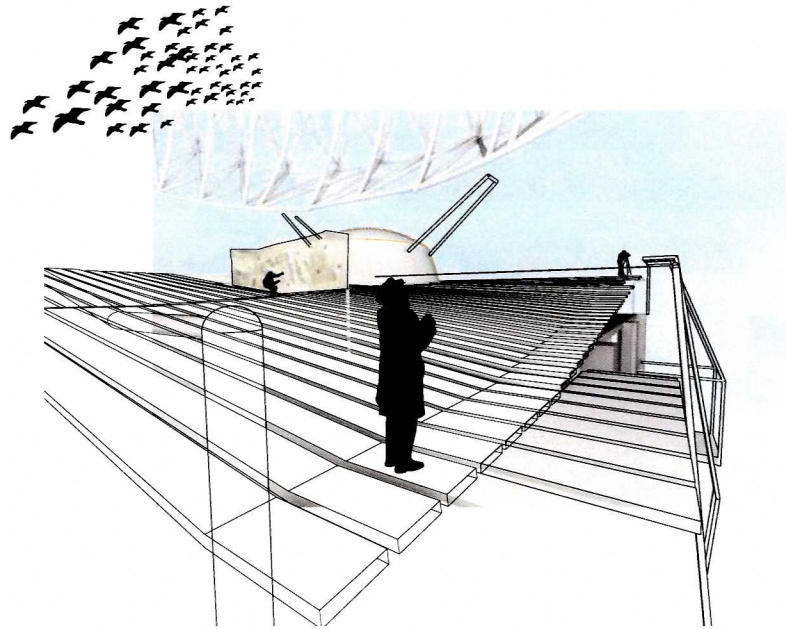
OL_1 : approach Ocular lattice



OL_2 : birds and surveillance history



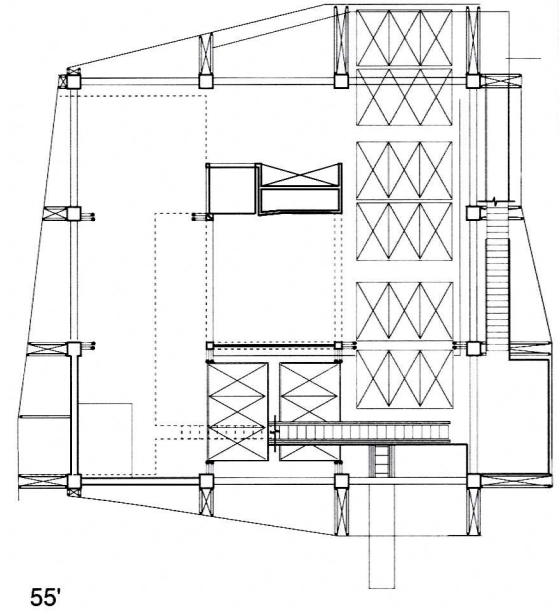
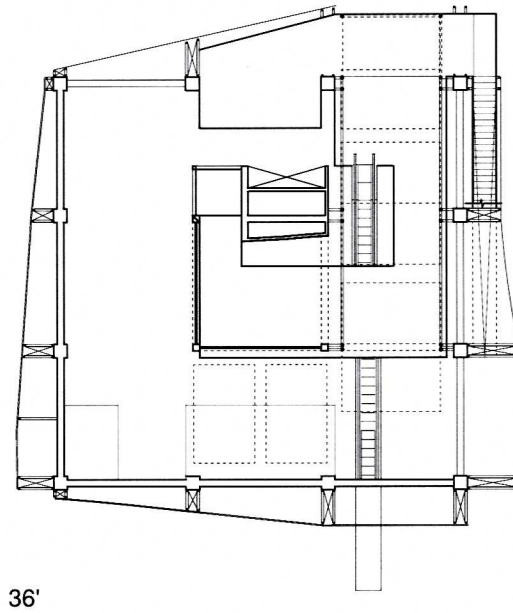
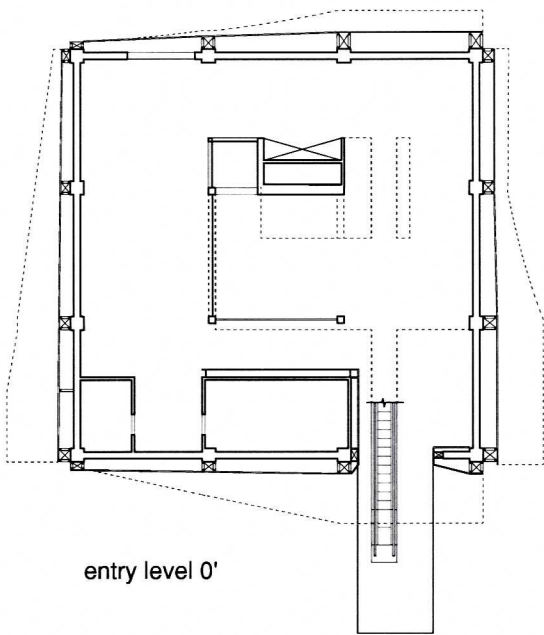
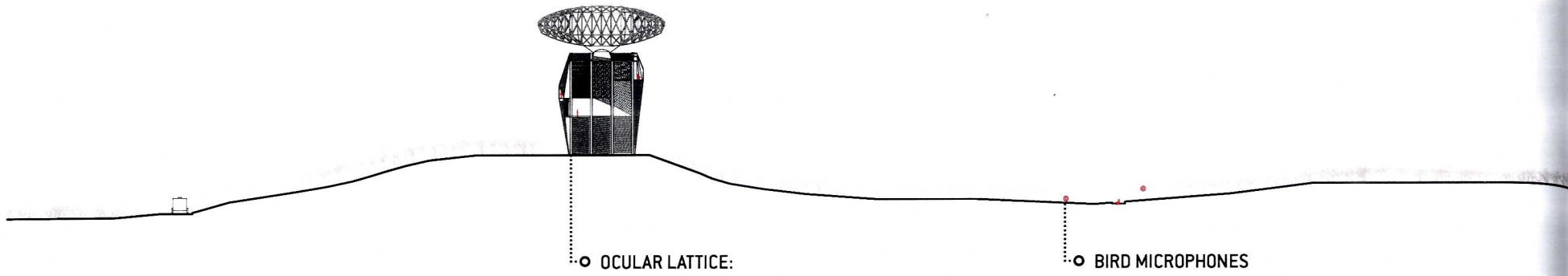
OL_3 : embed and expand



OL_4 : rock climb walk or ride

OCULAR

LATTICE

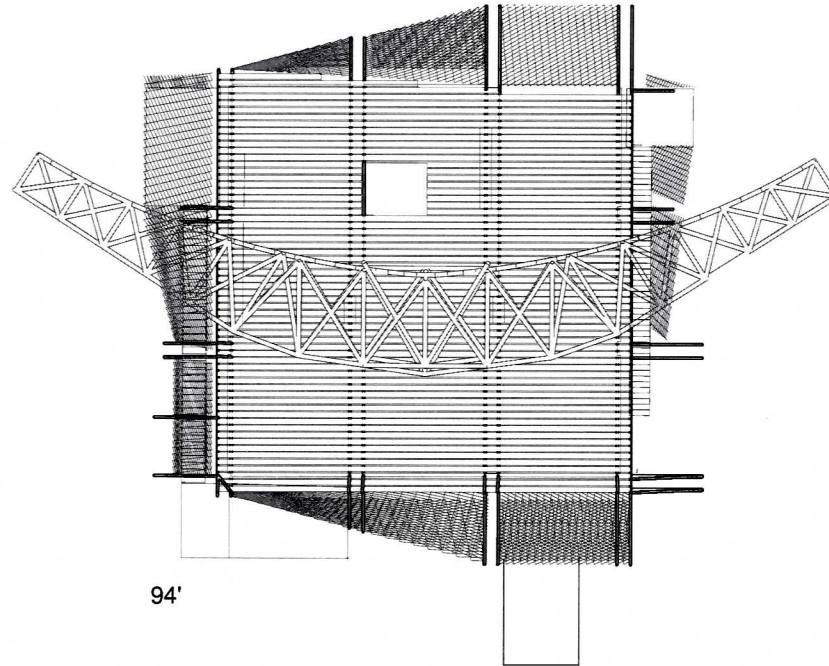
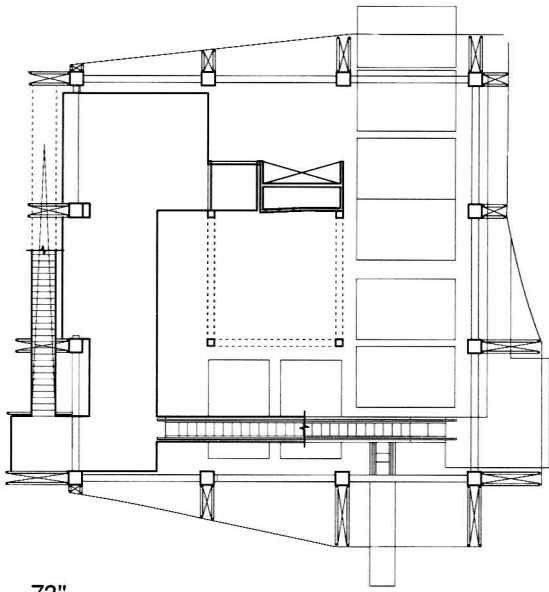


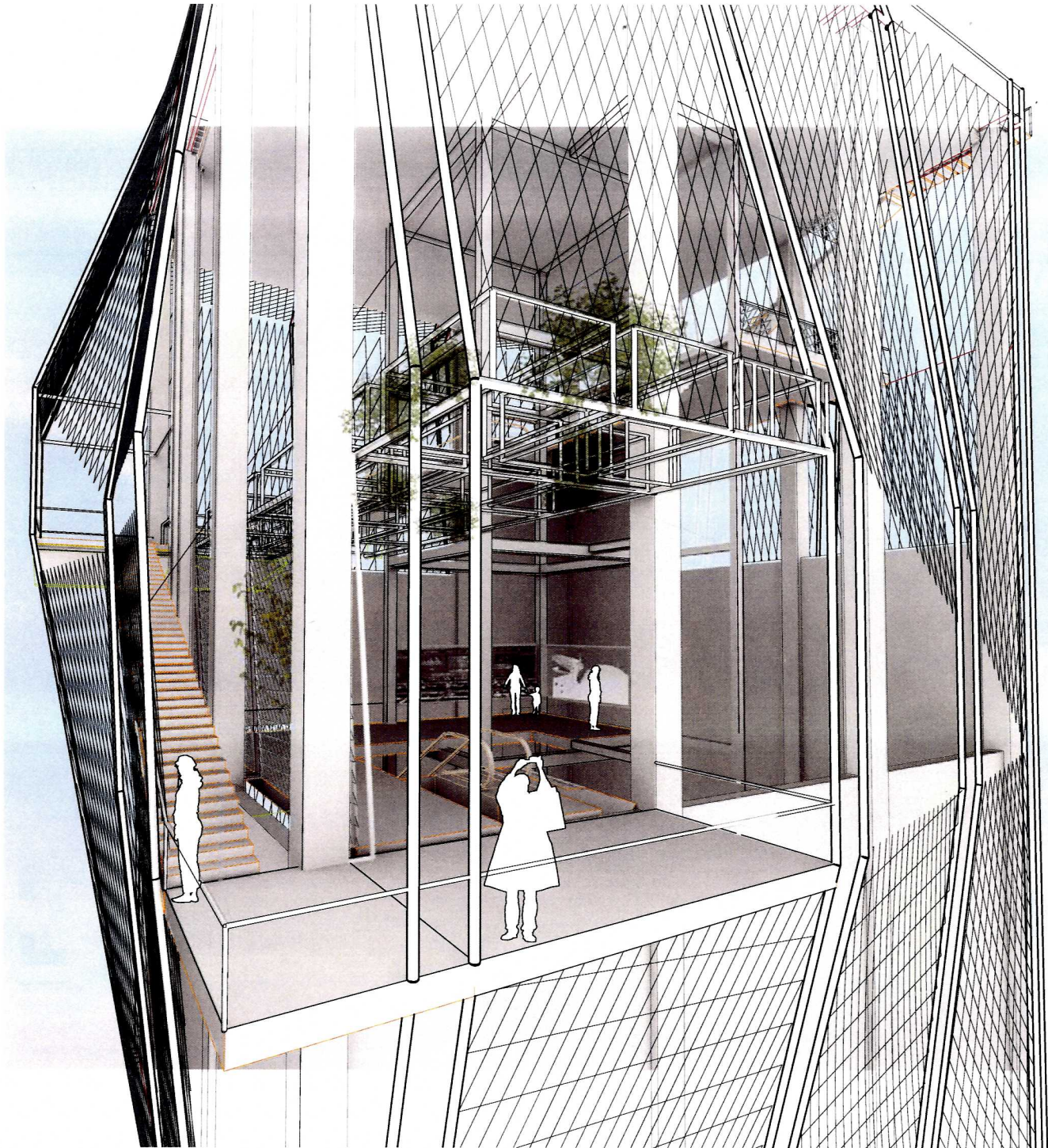
site section and Ocular Lattice plans

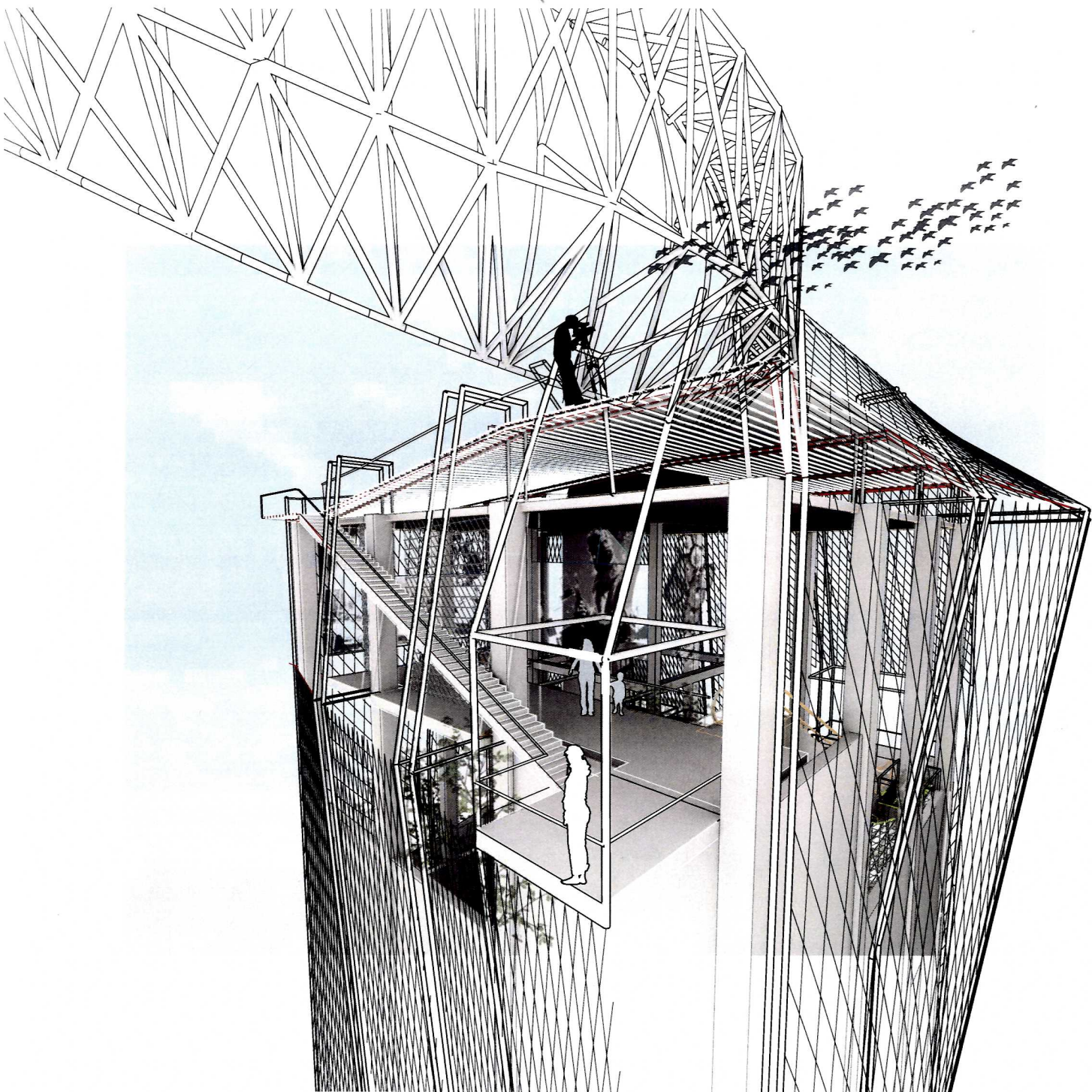


OCULAR

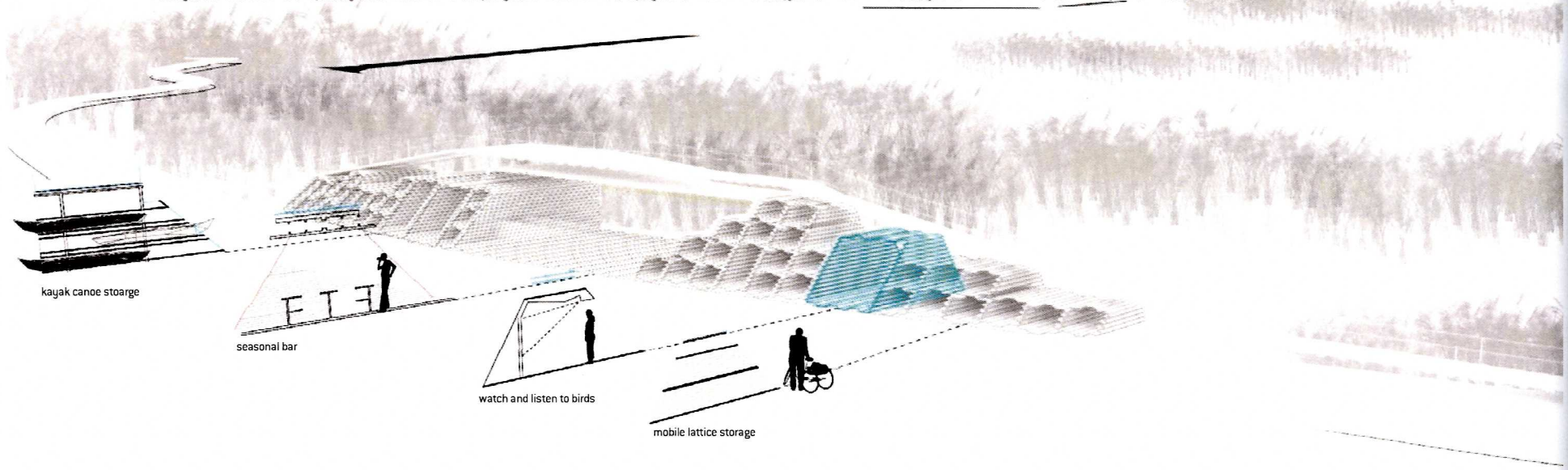
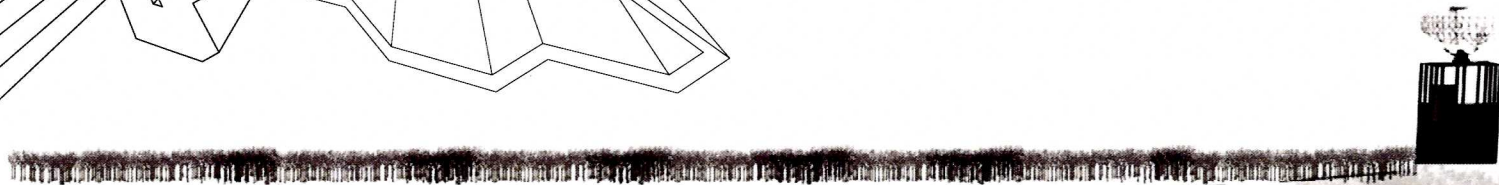
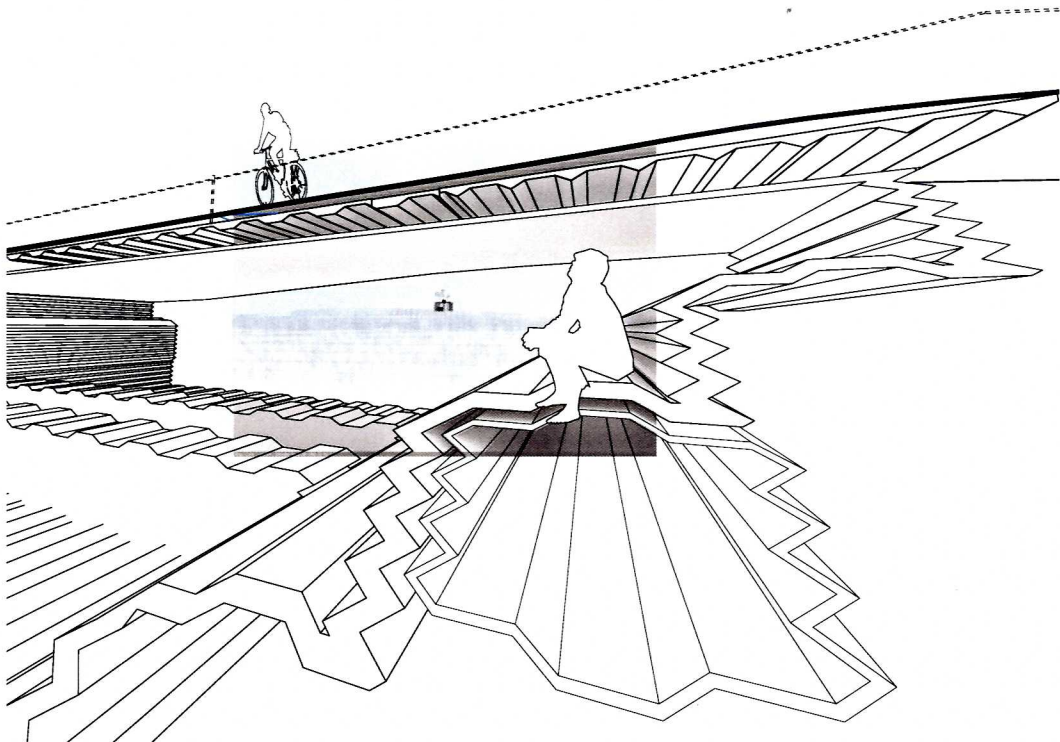
LATTICE



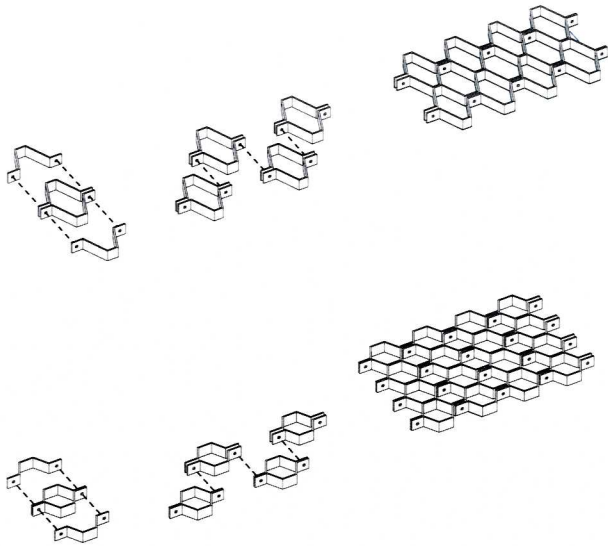




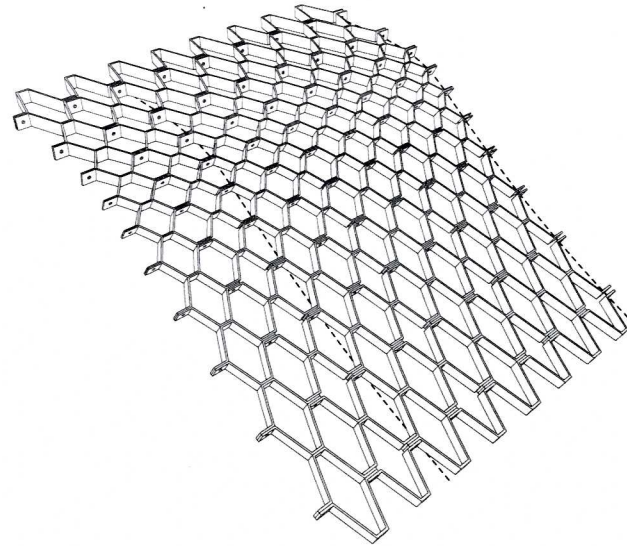
**TRACKING COLD
WAR HISTORY AND
BIRD MIGRATION**



kayak bar



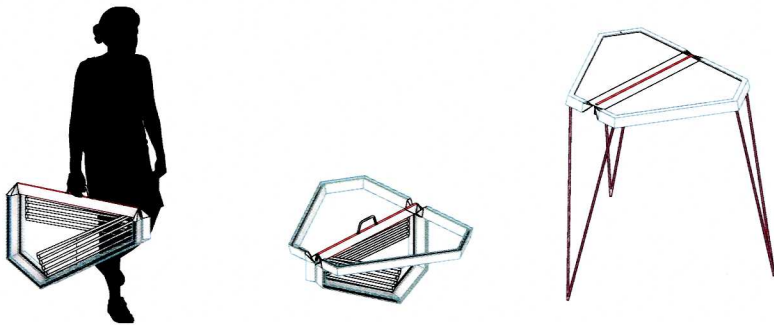
nesting / erosion control lattice



LATTICE ARCHITECTURE

Left:
Seasonal kayak bar with sound chambers where hikers can remotely listen to birds in Montauk.

Right:
Mobile lattice walk down



mobile lattice



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