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Field Guide to a Contested Forest HOME-OFFICE

The Sam Houston National Forest is a 160,000-acre non-contiguous landscape overseen by the US Department of Agriculture and the National Forest Service. The terrain is a rich assemblage of loblolly pines, bracken ferns, bluestems, bull nettles, skinks, skimmers, milk caps, and oyster mushrooms, among countless other species, all part of the East Texas Pineywoods ecoregion North of Houston. While the landscape is ostensibly "wild," the forest is in fact a highly managed territory: a patchwork of private property and public lands hosting recreation, farming, oil and mineral extraction, and timber harvesting. From archaeological digs and ecological preserves, to test landscapes and extraction sites, the forest is a messy landscape crisscrossed by hiking trails, utility easements, animal habitats, and pipelines.

Within the contested site of the Sam Houston National Forest, we propose a field station as an architectural experiment, one that explores the intimate practices of environmental sensing, climate action, and forest care. Somewhere between a tent and a building, it serves citizen-scientists, forest defenders, climate activists, and thru-hikers alike, operating as a low-tech laboratory, camp site, mobile classroom, and protest outpost. As easy to construct as it is to dismantle, its operable systems can be adapted to a wide variety of weather shifts, atmospheres, temperatures, and environments. Immersed in a lush understory of ferns and fungi, the field station imagines new protocols for stewardship and care within this landscape, thinking of the living forest not only as an ecosystem but also as a sensuous laboratory: full of sensors and citizens collecting data for future testimonials and stories. What follows is a field guide to this landscape, unpacking the protocols, practices, and contingencies of forest governance. An assemblage of documents, maps, and evidence, this field guide asks: how can we reorient our environmental encounters away from extraction toward a more open-ended and convivial relationship to the land?

HOME-OFFICE
[Daniel Jacobs and Brittany Utting]

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Fig. 01-1: McGuire, John E. *Sam Houston National Forest [Map].* Scale: ½" = 1 mile. Texas, US. U.S. Department of Agriculture Forest Service, 1967.

Fig. 01-2: *FIELD-STATION*, HOME-OFFICE, 2022.

Fig 02-1: *FIELD-STATION*, HOME-OFFICE, 2022.

Fig. 02-2: *Figure 1* from Rosti, Peter, Philip Father, and Alex Ramia. Atmospheric Sensor Network and Analytical Information System Related Thereto. Patent Application No. US 11,281,822 B2, filed March 17, 2020, issued March 22, 2022.

Fig. 03-1: Groat, Charles G. *Energy Resources of Texas [Map].* Scale 1: 1,000,000. Texas, US. The University of Texas at Austin Bureau of Economic Geography, 1981.

Fig. 03-2: *FIELD-STATION*, HOME-OFFICE, 2022.

Fig. 04-1: *FIELD-STATION*, HOME-OFFICE, 2022.

Fig. 04-2: United States Forest Service. *Desired and Unacceptable Spatial Patterns.* In the United States Forest Service Low Pole Stew Reoffer Contract, 2008.

Fig. 05-1: *FIELD-STATION*, HOME-OFFICE, 2022.

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Fig. 06-1: U.S. Congress. House. Multiple-Use Sustained-Yield Act of 1960. HR 10572. 86th Cong., 2nd sess. Introduced in the House April 25, 1960. Amended December 31, 1996. https://www.fs.fed.us/emc/nfma/includes/musya60.pdf

Fig. 06-2: *FIELD-STATION*, HOME-OFFICE, 2022.

Fig. 07-1: *FIELD-STATION*, HOME-OFFICE, 2022.

Fig. 07-2: Sam Houston State University. *Site Map of the Center for Biological Field Studies.* Sam Houston State University, 2022. https://www.shsu.edu/centers/cbfs/overview-resources.html.

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Fig. 09-1: *FIELD-STATION*, HOME-OFFICE, 2022.

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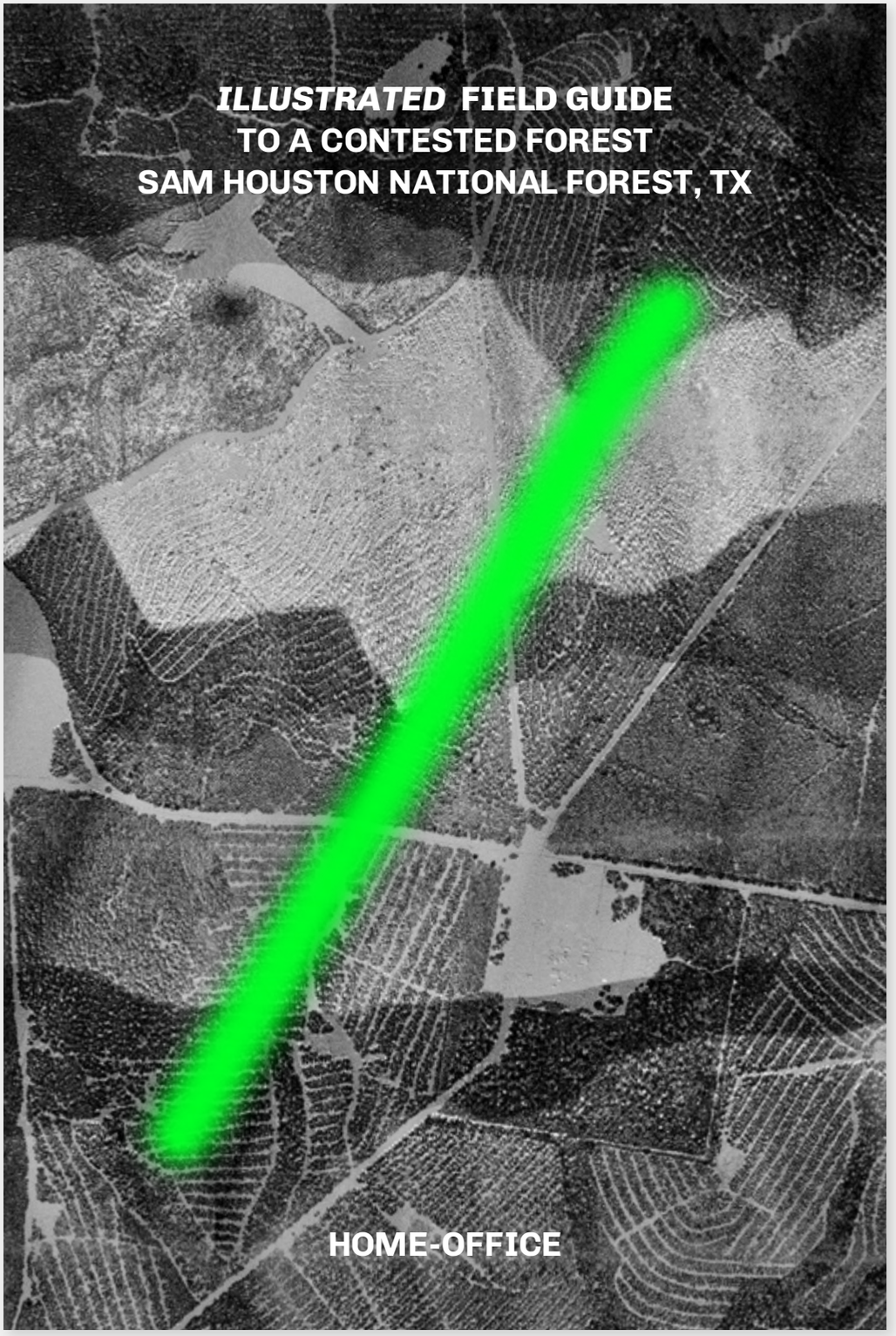
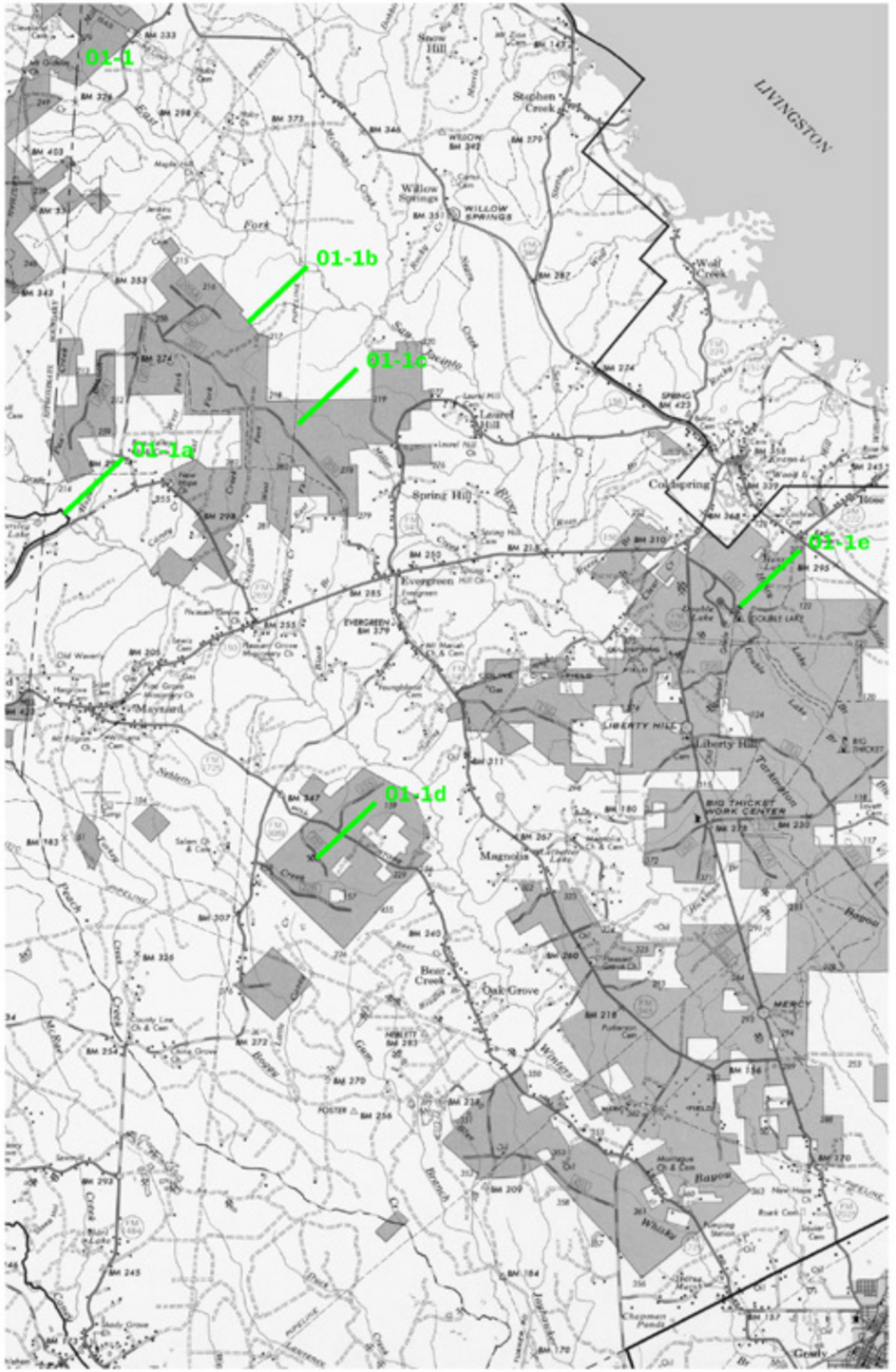




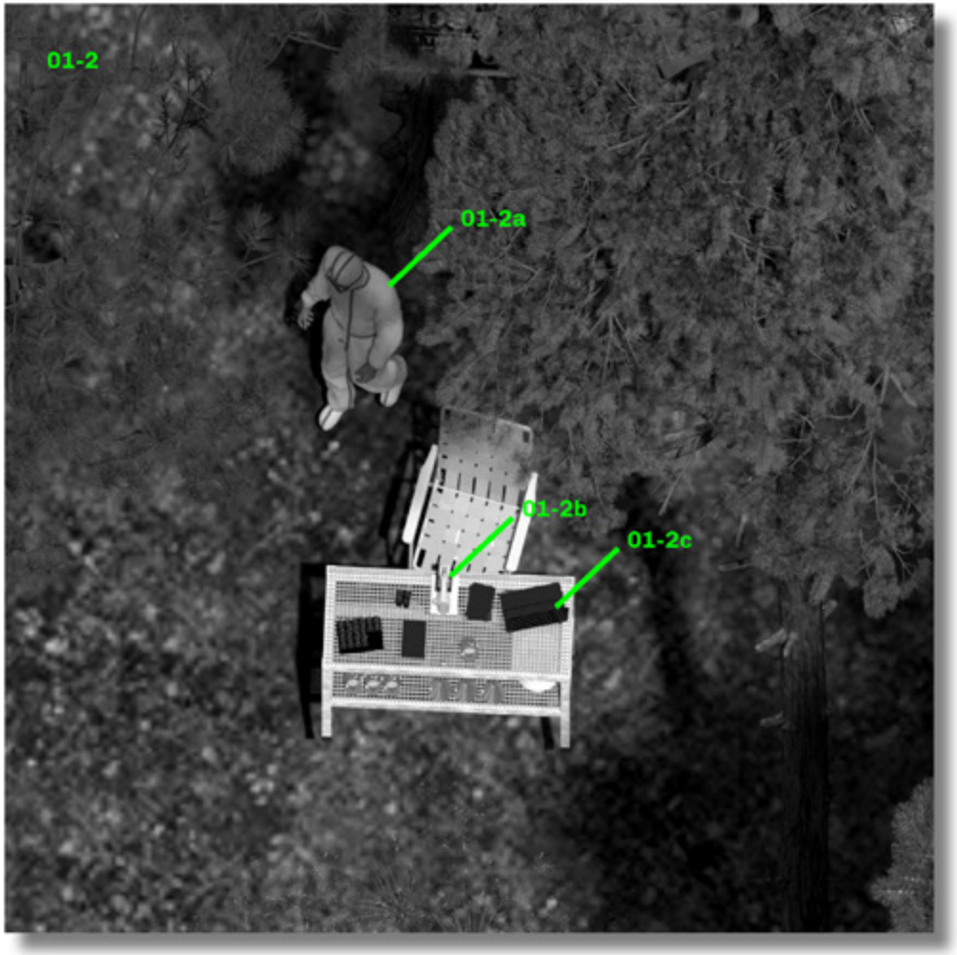


Fig. 01-1 Map of Sam Houston National Forest (Big Thicket and Raven District), Texas, 1974. Sam Houston National Forest is a non-contiguous landscape comprised of private and public land and managed by the USDA Forest Service

01-1a National forest boundary

01-1b National forest land [gray]

01-1c, 01-1d Extraction sites

01-1e Civilian Conservation Corps [CCC] recreation site. In the 1930s, the CCC replanted clearcut tree stands, built visitor facilities, roads, fire towers, and reclaimed eroded soils in the National Forests

Fig. 01-2 Mobile laboratory including scientific equipment and environmental sensors to monitor forest health

01-2a Citizen-scientist

01-2b Microscope for studying soil and plant samples

01-2c Satellite connected laptop for remote access to ecological data platforms

Fig. 02-1 Field station operation base

02-1a Operable envelope system to adapt to local weather and climate

02-1b Domestic equipment including adjustable bedding, folding furniture, and locker storage

02-2c Grid sampling method soil test monitoring for possible heavy metal contaminants

02-1d Sensor mounting equipment

02-1e UAV with laser scanning [LiDAR] capabilities for estimating carbon and vegetation biomass

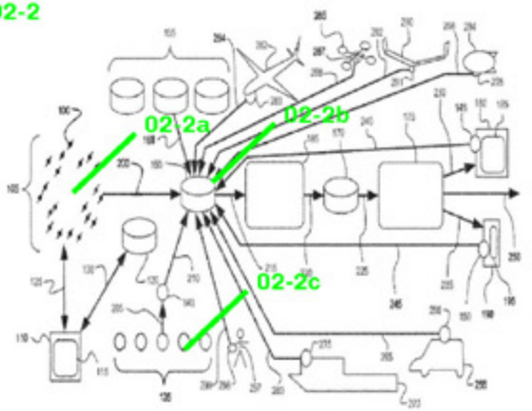
Fig. 02-2 Atmospheric Sensor Network and Analytical Information System, Patent No: US 11,281,822 B2. System diagram of atmospheric information network comprised of satellite-based, ground-based, and mobile sensor networks collecting data on air pollution and wind

02-2a Constellation of Low-Earth-Orbit satellites that serve as sensor platforms for air pollution sensors

02-2b Air pollution database

02-2c Ground-based sensor stations

02-2



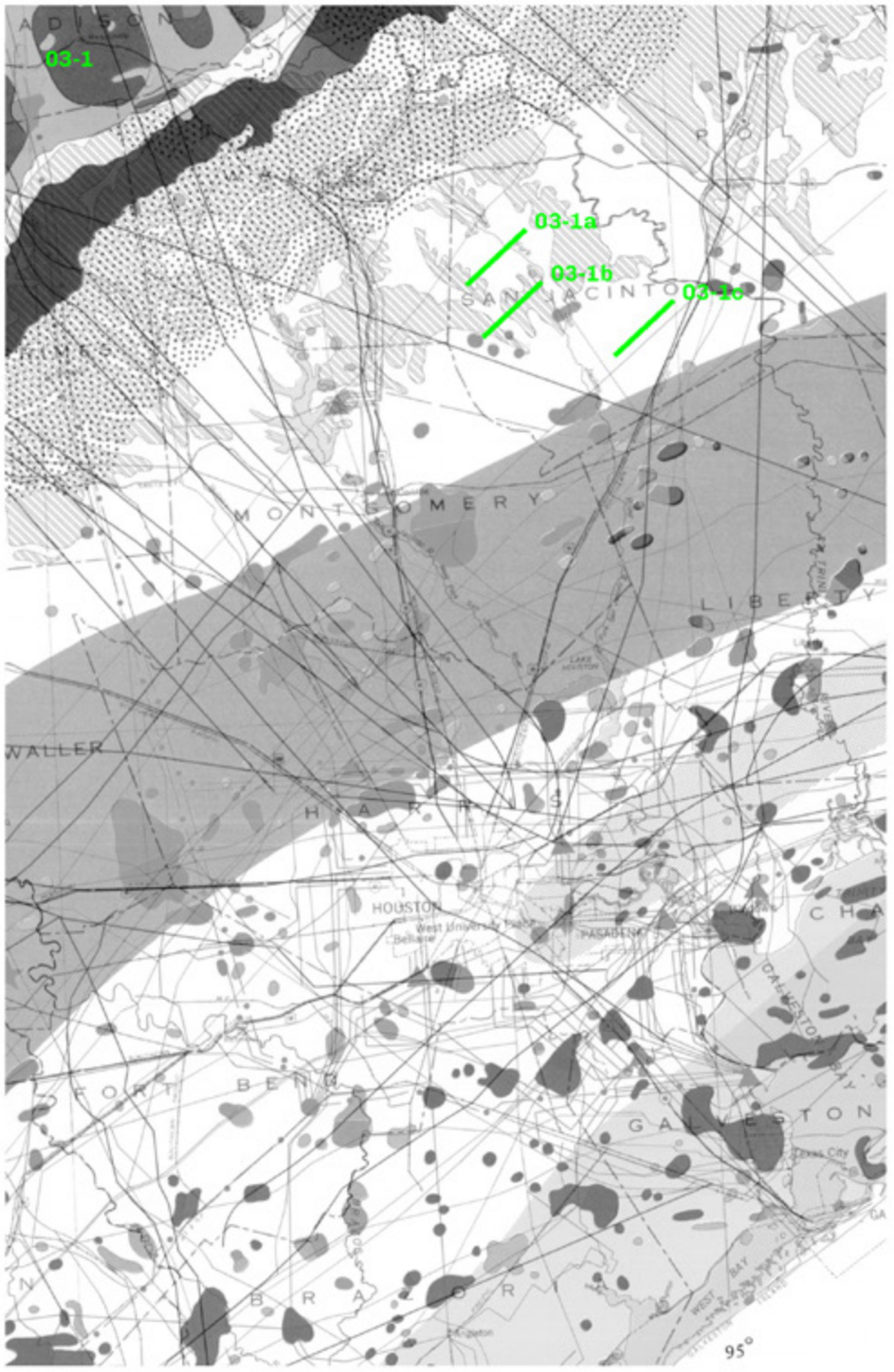


Fig. 03-1 Map of Energy Resources of Texas, 1981. Sam Houston Forest region contains possible extraction sites due to presence of subsurface resources. The federal government may lease oil, gas, and mineral rights with a no surface occupancy, although many of the mineral rights are held privately

03-1a Outcrop of uranium-bearing strata [Tertiary period]

03-1b Oil and gas fields [Eocene and Paleocene producing horizon]

03-1c Quartz-rich industrial sand, very fine to medium grained [Willis Formation, Pliocene]

03-2

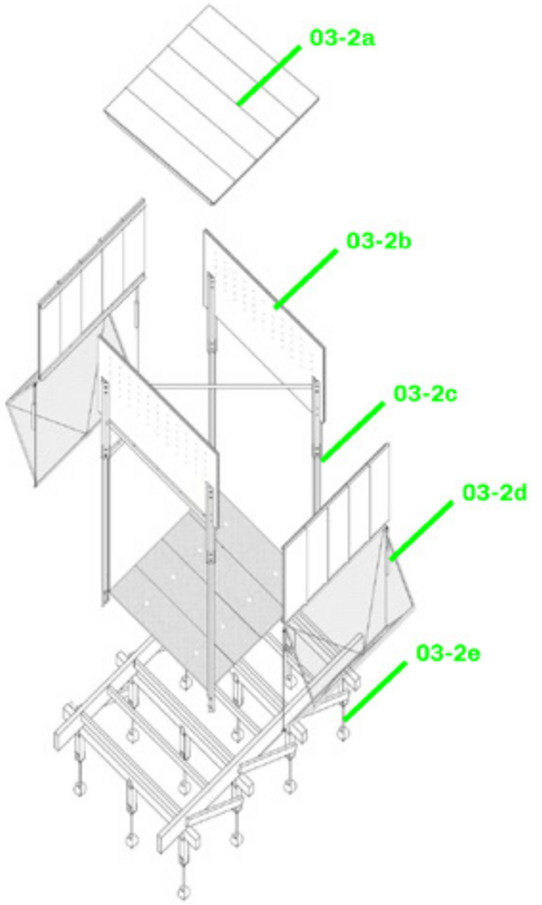


Fig. 3-2 Field station structural diagram
Note: Materials should be easy to assemble with minimal tools, labor, and expertise

03-2a, 03-2b Adjustable roof membrane [for ventilation and weather protection]

03-2c Slotted structural system [with galvanized steel angles, bolted frame]

03-2d Operable mesh envelope [with counter-weight pulley system]

03-2e Wood or recycled plastic deck structure on helical screw pile foundation [hand-driven, low-impact]

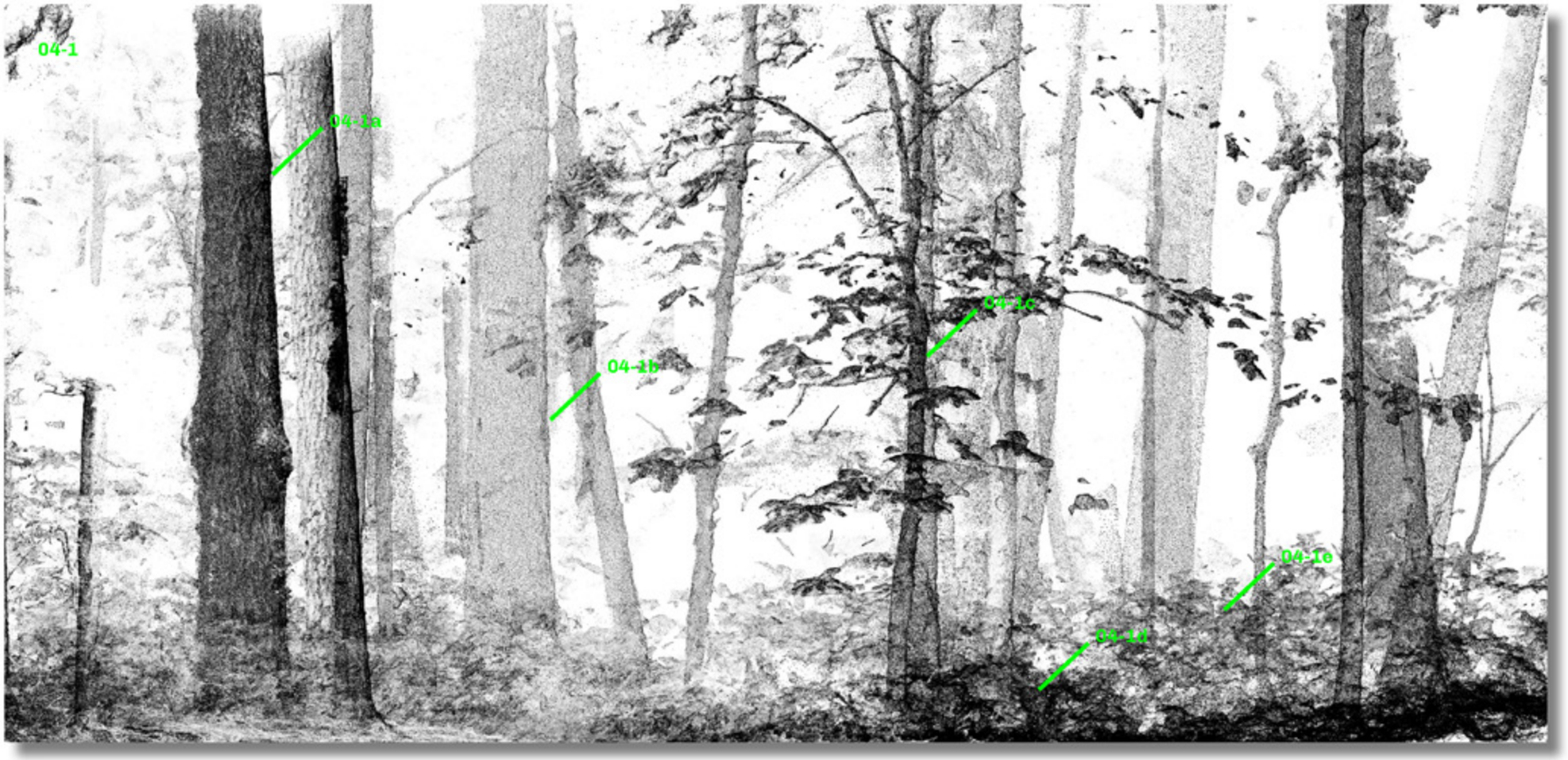


Fig. 04-1 Point cloud of Sam Houston National Forest generated from photogrammetry model, used to measure canopy height, crown volume, species distribution, and tree density for timber extraction and ecosystem analysis

04-1a Loblolly pine [*Pinus taeda*]

04-1b Short-leaf pine [*Pinus echinata*]

04-1c Southern sugar maple [*Acer floridanum*]

04-1d Wax myrtle [*Myrica cerifera*]

04-1e Bracken fern [*Pteridium aquilinum*]

Fig. 04-2 Timber harvesting and replanting guide for sustainable forestry [Sam Houston National Forest is managed under a sustainable yield principle, with proceeds from sales given to local counties for schools and roads]

04-2a Forestry guide illustrating desirable spatial pattern of forest trees, grown in variable clumps with gaps for tree succession

04-2b Forestry guide illustrating unacceptable pattern of forest trees, organized as uniform grid for efficient harvesting of monocrop

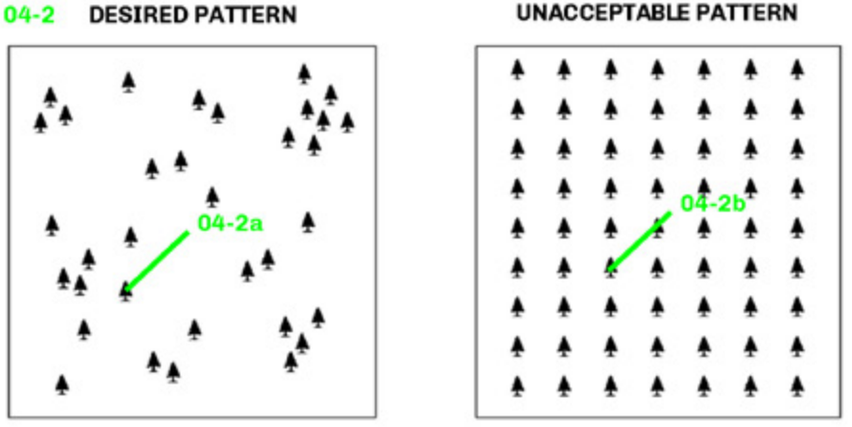


Fig. 05-1 Ground-based sensor station monitoring a site vulnerable to extraction

05-1a Notice of private property [there are 580 miles of boundaries in forest]

05-1b Proximity detector to monitor wildlife and habitat changes

05-1c All-terrain tripod mounting system for air and soil sensors

05-1d Polycrystalline solar panel array

05-1e Forestry marking indicating trees to be harvested

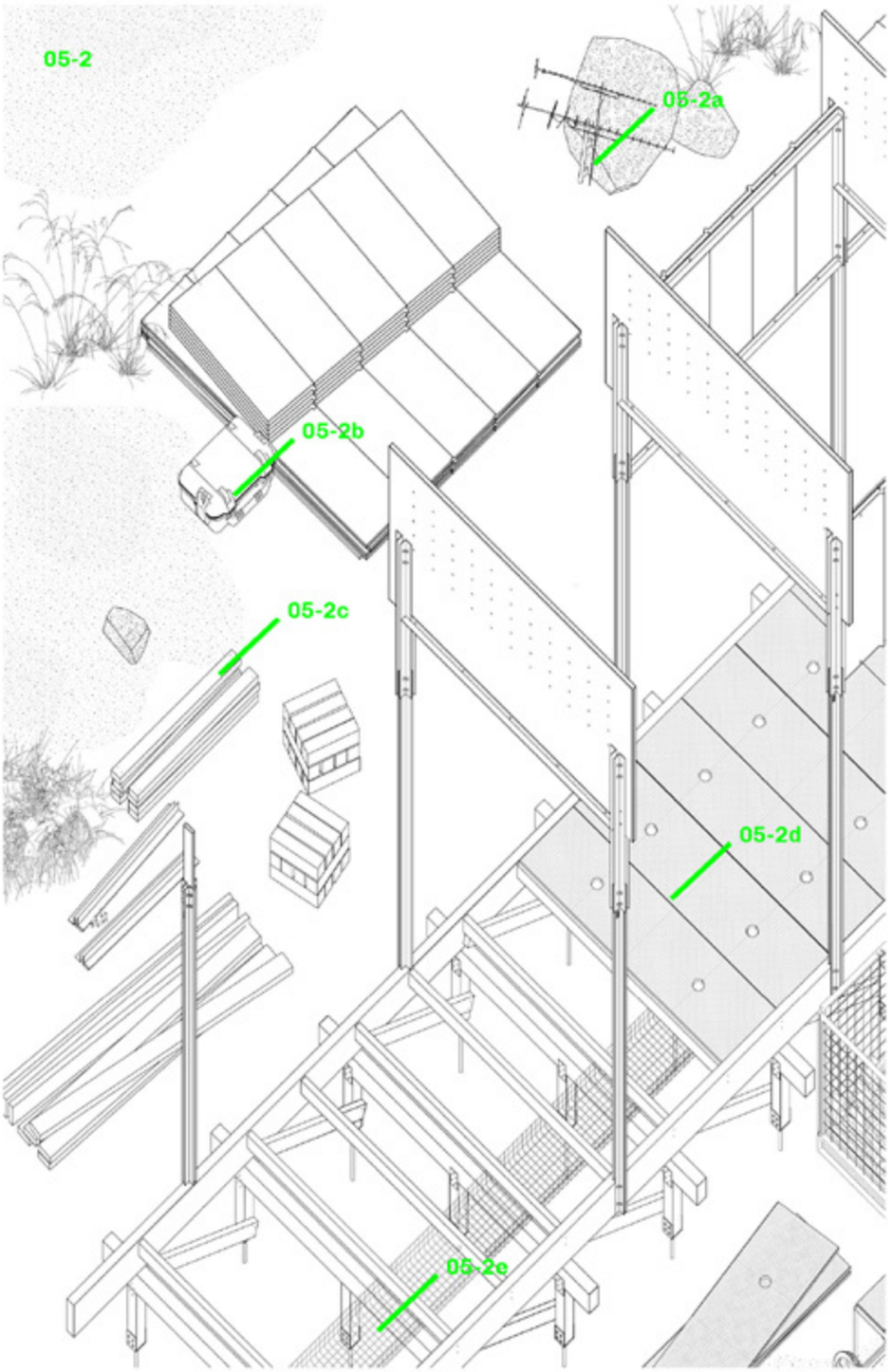


Fig. 05-2 Field station deployment strategy for multiple terrain types, minimizing site preparation and environmental impact

05-2a High-power FM broadcasting antennae for remote locations

05-2b Protective storage for scientific instruments

05-2c Flat-packed, light-weight, and modular materials for easy transport

05-2d Permeable grating for drainage and access

05-2e Cable tray system to secure and coordinate wire conduits

06-1

74 STAT.] PUBLIC LAW 86-517—JUNE 12, 1960 215

Public Law 86-517

AN ACT

June 12, 1960
[H. R. 10572]

To authorize and direct that the national forests be managed under principles of multiple use and to produce a sustained yield of products and services, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it is the policy of the Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes. The purposes of this Act are declared to be supplemental to, but not in derogation of, the purposes for which the national forests were established as set forth in the Act of June 4, 1897 (16 U.S.C. 475). Nothing herein shall be construed as affecting the jurisdiction or responsibilities of the several States with respect to wildlife and fish on the national forests. Nothing herein shall be construed so as to affect the use or administration of the mineral resources of national forest lands or to affect the use or administration of Federal lands not within national forests.

National forests. Management.

30 Stat. 34.

SEC. 2. The Secretary of Agriculture is authorized and directed to develop and administer the renewable surface resources of the national forests for multiple use and sustained yield of the several products and services obtained therefrom. In the administration of the national forests due consideration shall be given to the relative values of the various resources in particular areas. The establishment and maintenance of areas of wilderness are consistent with the purposes and provisions of this Act.

Multiple use; sustained yield.

SEC. 3. In the effectuation of this Act the Secretary of Agriculture is authorized to cooperate with interested State and local governmental agencies and others in the development and management of the national forests.

SEC. 4. As used in this Act, the following terms shall have the following meanings:

Definitions.

(a) "Multiple use" means: The management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

(b) "Sustained yield of the several products and services" means the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the national forests without impairment of the productivity of the land.

Approved June 12, 1960.

06-1a

06-1b

06-1c

Fig. 06-1 The Sam Houston National Forest is managed under the Multiple-Use Sustained-Yield Act, ensuring the balanced management of all forest resources including recreation, wildlife, watersheds, timber, and minerals

06-1a The right to extract minerals and energy resources in national forests is maintained for public benefit

06-1b Renewable surface resources such as timber must be maintained for multiple uses and sustainable yield

06-1c The values of forest resources are not necessarily those that will give the greatest economic return [such as biodiversity and carbon sequestration]

Fig. 06-2 Meeting of local volunteers discussing forest care and trail maintenance. Forest stewards use first-person observation and data collected by community members to measure habitat vulnerability when assessing proposals for resource extraction

06-2a Lone Star Hiking Trail

06-2b Field station

06-2c Campsite [Trail head #8]

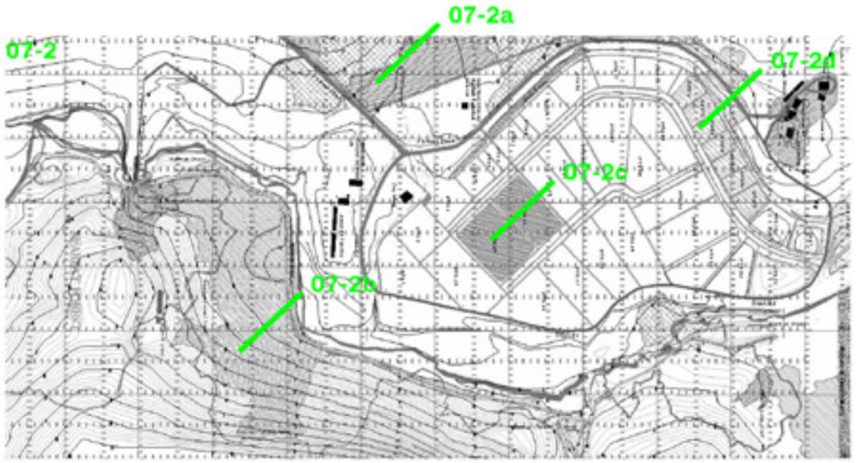


Fig. 07-1 Protests against federal concessions for oil exploration and mineral extraction in Sam Houston National Forest. Although federal leases for extraction are permitted under the Multiple-Use Sustained-Yield Act of 1960, local forest stewards can protect ecosystem health by monitoring habitat distress and challenging federal leases in court

07-1a Access road indicating location of proposed pipeline

07-1b Forest defender

07-1c Existing 120kV power line and utility easement

Fig. 07-2 Research landscapes at the Sam Houston State University Center for Biological Field Studies

07-2a Mature stands of Shortleaf Pine and Loblolly Pine

07-2b Bottomland hardwood [deciduous forested wetlands including river swamps and floodplains]

07-2c Canebrake [thicket of grasses including River Cane and American Bamboo]

07-2d Coastal prairie restoration zones

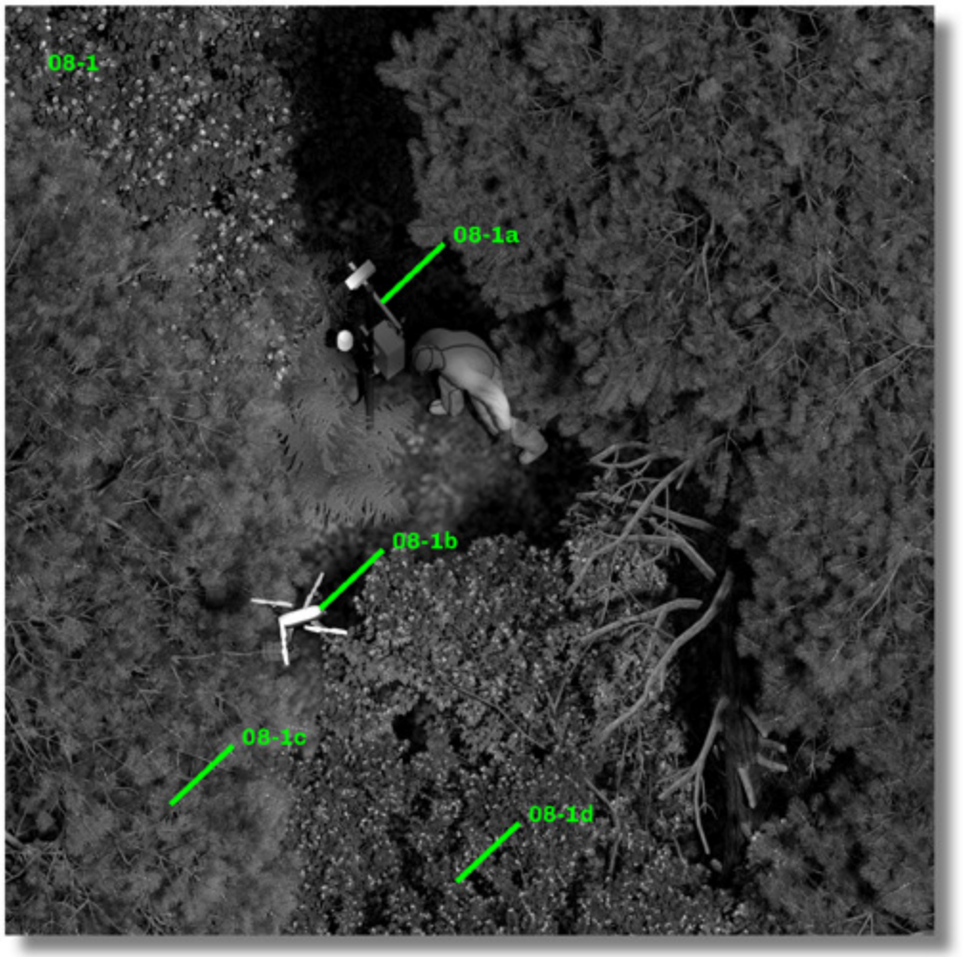


Fig. 08-1 Environmental sensors and drone survey equipment to detect ecological disturbance such as illegal logging, and pollutant emissions at disclosed extraction sites in the forest

08-1a Ground station equipped with environmental sensors for monitoring air, water, and soil composition for pollutants

08-1b UAV drone for long-range aerial forest survey

08-1c Loblolly pine [*Pinus taeda*]

08-1d American Elm [*Ulmus americana*]

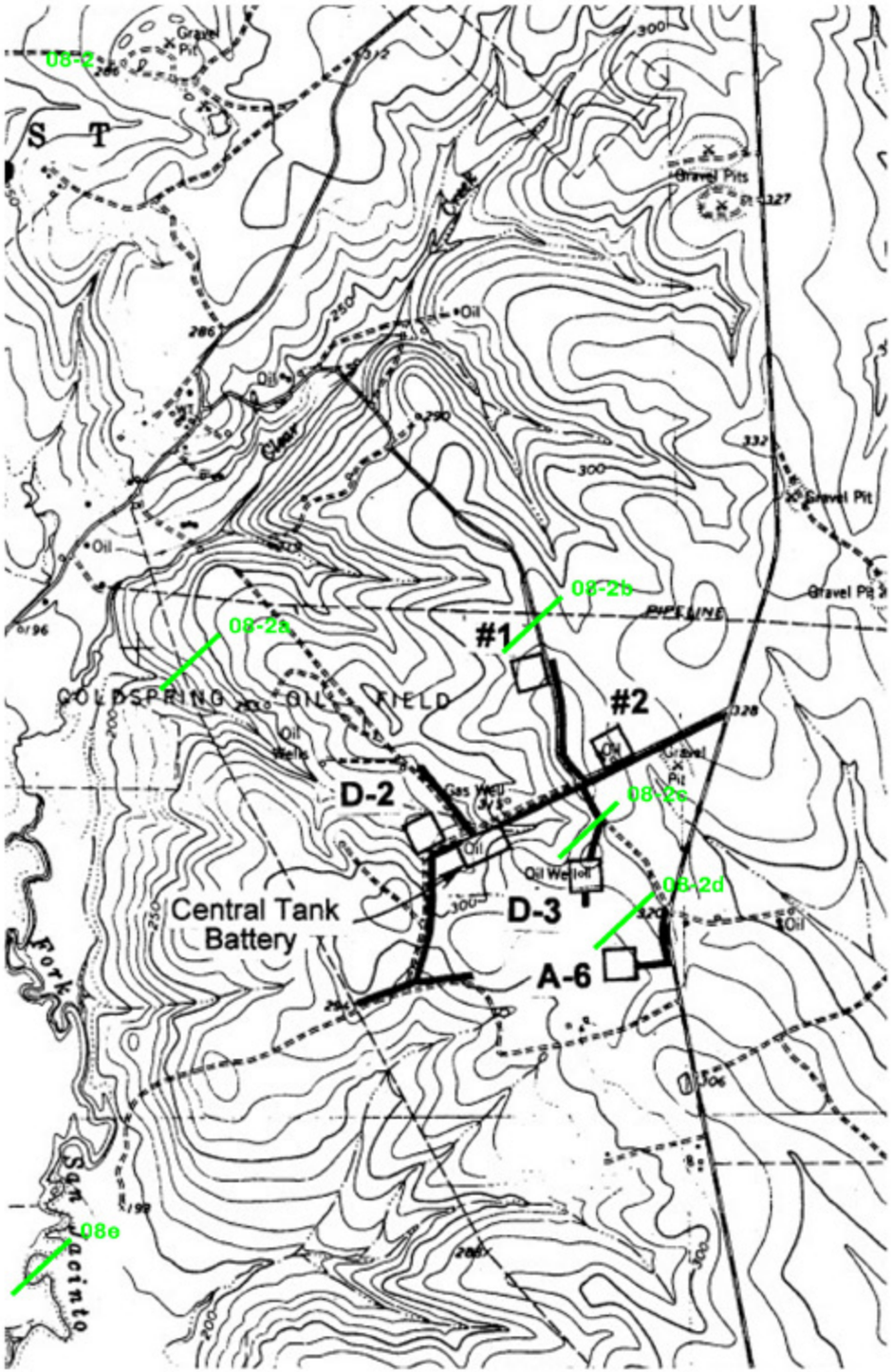


Fig. 08-2 Archaeological survey conducted for Famcor Oil, Inc. of Houston of proposed well pads, pipeline, electrical line, and access road in the Sam Houston National Forest. Construction recommended to proceed as per guidelines of Multiple-Use Sustained-Yield Act

08-2a Existing oil field [Coldspring]

08-2b Proposed new oil well site

08-2c D-3 current saltwater disposal well; disturbed

08-2d A-6 proposed new well site

08-2e East Fork San Jacinto River [part of San Jacinto River Watershed]

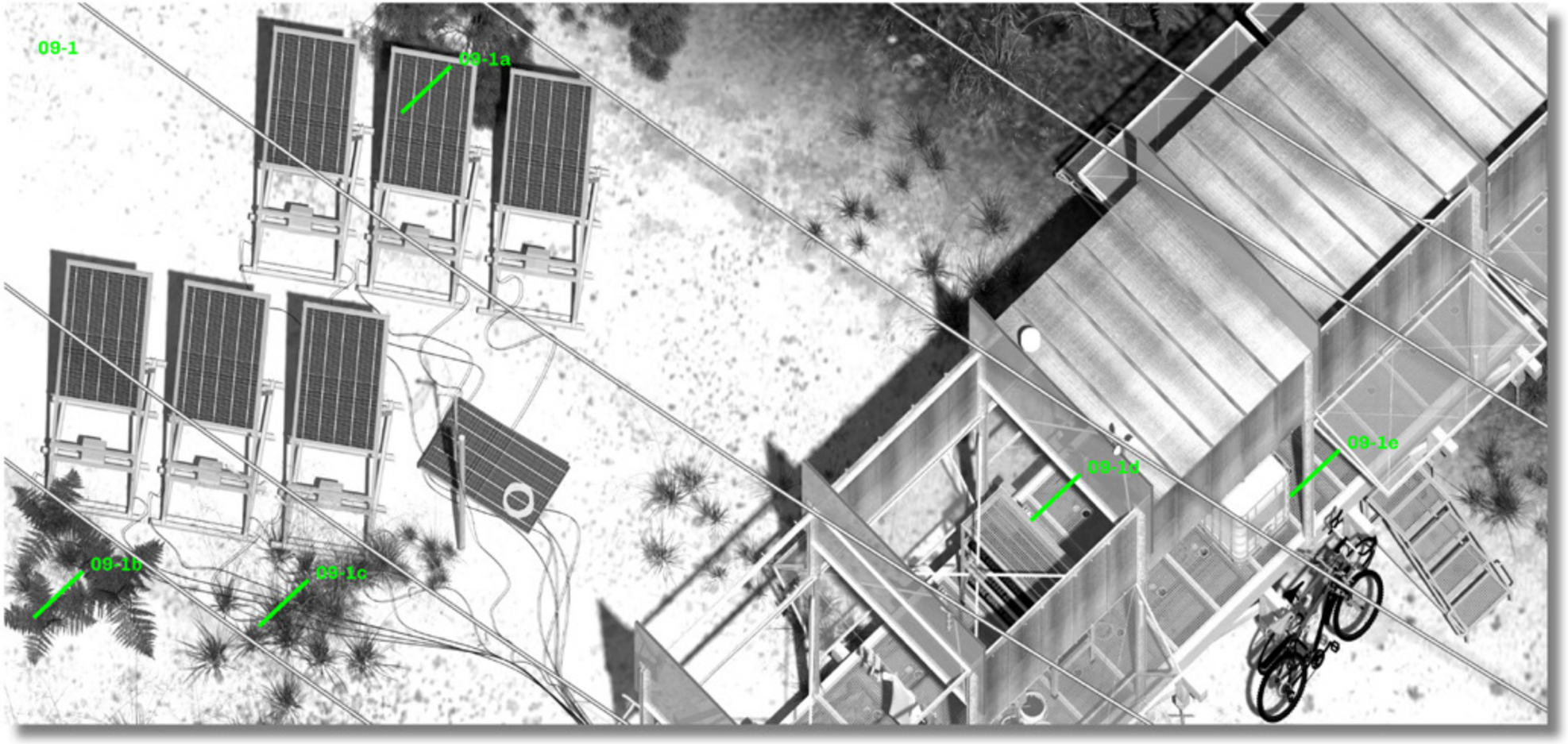


Fig. 09-1 Field station monitoring habitat distress in recently logged utility corridor

09-1a Polycrystalline solar panel array for independent energy source

09-1b Bracken Fern [*Pteridium aquilinum*] and Netted Chainfern [*Woodwardia areolata*]

09-1c Big Bluestem [*Andropogon gerardii*] and Broomsedge grasses [*Andropogon virginicus*]

09-1d UV spectrum LED grow table for seedlings

09-1e Potable water supply for forest visitors

Fig. 09-2 Aerial Forest Inventory System, Patent No: US 9,063,544 B2. Aerial survey using light detection and ranging (LiDAR) system to generate point cloud model of forest for forest inventory management platforms

09-2a Unmanned aerial vehicle (UAV) using LiDAR system

09-2b Cloud cover obstructing UAV scanner [may effect cloud model density]

09-2c Surveyed forest. Inventory systems collect data on tree types, height, age, as well as forest boundaries, wildlife and vegetation, and habitat health

09-2