

HAWAI'I COASTAL FIELD SITES DIRECTORY PROJECT

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INTRODUCTION

Field trips are important to students in various areas of study--notably in natural and earth sciences--as well as for out-of-school adults who participate in nature walks. For outdoor or environmental education, field studies are almost necessary to complement more conventional methods of teaching. In one recent review of the literature, it was concluded that:

Research results provide much evidence to support field trips as an effective instructional technique at the elementary, secondary and college levels. Although results are mixed, nearly all of the evaluation studies have demonstrated that students learn well from field instruction. When comparisons have been made with conventional methods of instruction, the field techniques have been as effective or more so than other methods. (Mason, 1980)

The very popularity of field trips, however, has led to recent concerns that certain sites may be overused. A few sites (e.g., Kewalo reef flat, Mā'ili Point) are heavily impacted by field trips--often from overcollecting and trampling--while some other sites are underutilized due to a lack of easily available information. With the increased interest in environmental and marine studies since the early 1970s, more and more people are visiting coastal sites having various natural features. The draft State master plan for marine education estimated that 36,000 students and 1,200 teachers in grades K-6 may be utilizing the Hawai'i Nature Study program in the early 1980s; another 3,000 students and 60 teachers in grades 10-12 were estimated in marine studies. Needless to say, many of these students and teachers will be visiting various sites along the shoreline.

The purposes of this paper are to: (1) describe a joint UH Sea Grant Advisory Service and State Department of Education

(DOE) project to develop a coastal field sites directory for Hawai'i; (2) stimulate participants at the Volcano Conference, and their colleagues, to seek effective and appropriate uses of field trip sites; (3) encourage conference participants to share their knowledge of specific sites by contributing to the directory; and (4) stimulate research on the effects of site visitation on various Hawaiian environments.

DISCUSSION

Despite the increasing popularity of coastal field trips--to places featuring tidepools, reef flats, marshes, strand flora, marine algae, intertidal zones, lagoons, mud flats, and beaches--a comprehensive directory focusing on sites with such natural features has not been compiled to date in a form useful to educators. Examples of available publications which feature a number of coastal sites include:

- Marine summer science training field guide (UH, in press)
- Coral: a Hawaiian resource (State DOE, 1981)
- A compendium of campsites and one-day visitation sites in the state of Hawai'i (State DOE, 1971)
- Educational field trips in Hawai'i (State DOE, 1971)
- Outdoor education studies K-12 (State DOE, 1976)

There are a few guides for specific sites such as Paiko Lagoon (Arrigoni, 1977) and Ka'ena Point (Arrigoni, 1979). Finally, Fosberg (1961) published a set of field trip guides which focuses on flora in areas such as Hanauma Bay, Koko Head, and Makapu'u.

To promote the effective and appropriate utilization of shoreline areas for educational purposes, a coastal field sites directory project was jointly initiated by the UH Sea Grant Advisory Service and the State DOE Office of Instructional Services. The purposes of the directory are to provide information on specific field trip sites for use by educators and to encourage suitable activities which are compatible with the resources at each site. The directory could also help planners and decision-makers recognize the educational resources in areas pending development. The directory highlights sites having natural features which should be of interest in a variety of subject areas. Marine facilities and institutions (e.g., Sea Life Park, Waikiki Aquarium, Hawai'i Institute of Marine Biology) were not included; although they are excellent places to visit in conjunction with marine studies, such sites are adequately described in other directories. It was intended that the directory could be expanded to include inland sites; the Sierra Club, Hawai'i Chapter, is considering using the directory format for its high school hiking program to describe specific trails. Also, the

directory could be used by: (1) students in primary/secondary schools (both public and private) and college students; and (2) educational groups who conduct field trips for members and the general public--such as the Sierra Club, Audubon Society, Conservation Council for Hawai'i, and Waikiki Aquarium. Finally, the directory was purposely designed in a loose-leaf format to facilitate updating, correcting, and adding material.

The directory project began in early 1981 with a series of workshops which had several purposes: establish the need for a directory; develop a format and identify candidate sites (initially on the island of O'ahu); gather information from resource people familiar with various sites; and develop information sheets. By mid-1981, twelve sites on O'ahu were selected for initial description:

- Ka'ena Point
- Queen's Beach
- Kawainui Marsh
- Malaekahana
- Paiko Lagoon/Peninsula
- Kahana Bay
- Kewalo Reef Flat
- Ma'ili Point
- 'Ewa Beach Park
- Makapu'u Beach Park
- Fort Kamehameha
- He'eia Fishpond

In addition, supplementary material was developed including bibliographies, resource materials, field trip planning and safety guidelines, and selected articles.

The State DOE will be publishing the first edition this summer; the camera-ready copy went to the printer at the end of May. The directory will include detailed descriptions for ten of the initial 12 sites. The main items included in the site-specific information sheets are: instructions on how to get to the site; necessary clearances and how to get them; available facilities and emergency information; unique biological/ecological, geological/physical, and cultural features of the site; suggested activities; conservation and safety precautions; available resource materials and suggested readings; and a site map. The information sheets should provide sufficient basic information for anyone planning a field trip. The directory also includes sections on available resource materials (i.e., film strips, films, slide shows); selected articles on Hawaiian ecosystems and processes; selected articles on field tripping--particularly the impacts of visitation on various coastal ecosystems; and an annotated bibliography of general literature useful for field tripping. The publication will be titled, A Compendium: Coastal Field Sites in Hawai'i. DOE is already in the process of

adding many more sites statewide: 18 for the island of Maui; 10 sites apiece for East and West Hawai'i; 10-18 sites for Kaua'i; and 24 additional sites for O'ahu. Except for the Kaua'i segment which is expected to be underway this Fall, the 62 additional sites for the islands of O'ahu, Maui, and Hawai'i are already in progress and expected to be completed later this year, hopefully in November (see Table 1 for a tentative list of the sites).

In conjunction with the directory project itself, UH Sea Grant and the DOE cosponsored a series of field trips to some of the 12 O'ahu sites which were initially selected. Over the course of the project, trips were taken to Ka'ena Point, Malaekahana, Paiko Lagoon, Kahana Bay, and Fort Kamehameha. Resource people familiar with each site were asked to share their knowledge with participants. Generally speaking, the field trips were successful in acquainting participants with the natural and cultural features of each site, as well as developing additional information for the directory; ideas for activities were also suggested and exchanged. Another activity which supplemented the overall project was a special half-day workshop held May 29, 1982 on beach and water safety for field trips. Resource people from a variety of agencies presented information on: preparing for a safe field trip, dangerous marine organisms, analyzing beach and ocean conditions, and basic first aid and emergency response. DOE plans to hold teacher workshops in the future to further develop activities for specific field trip sites. All workshops and field trips sponsored under the directory project have been open to any teacher, field trip leader, or interested individual. Anyone in this audience who wishes to get on the regular mailing list for future activities can contact the author later.

SUMMARY

Several observations can be made as a result of the project. First, there is a tremendous wealth of information on specific sites having important educational resources. This information is loosely held by many individuals in diverse professions, interests, and organizations; the directory project helped in the compilation and dissemination of this valuable information. There are now almost 100 individuals, mainly on O'ahu, who are on a regular mailing list for the project; in a sense, they are also now part of an information network.

Second, educators extensively use coastal sites for environmental or outdoor education, interpretation, and nature walks in many subject areas. For these educators, the directory offers a convenient source of useful information.

Third, the directory can help reduce the impact of visitation at certain sites by encouraging use of other suitable areas. Also, appropriate uses at given sites are strongly encouraged (for example, observation of wildlife or sand studies). When necessary, specific items of concern are indicated (e.g., endangered species, vulnerable ecosystems, prohibition against collecting, etc.).

Fourth, the directory serves as an inventory of coastal areas having educational values. The directory helps document educational uses of an area which need to be considered in land use decisions involving rezoning, shoreline management permits, and other similar government approvals. For example, the diverse educational opportunities available at Queen's Beach are now better described as a result of the directory and recognized as an important consideration in development plan discussions.

RECOMMENDATIONS

1. Conference participants are urged to obtain the directory from the UH Sea Grant Advisory Service or the DOE Office of Instructional Resources and test it. The directory was designed in a loose-leaf format to facilitate future changes. Suggestions for further improvements will be most welcome.

2. Participants are also encouraged to share their knowledge on other sites of interest which are not now included. One of the difficulties with the project was finding enough authors to write individual information sheets. Participants at the Volcano Conference could make a significant contribution to the overall directory by volunteering to write additional sections.

3. In planning field trips, users of the directory are urged to first consider the educational objectives of the trip and the resources of the area--particularly sensitive, unique or rare features. Activities should be carefully planned and conducted to avoid long-term deterioration of the site. Of special concern in many coastal environments are the effects of trampling, collecting, and general disturbance of animals.

4. Finally, participants are encouraged to initiate research on the effects of visitation upon various Hawaiian shoreline environments. The literature is very limited for Hawai'i, although fairly abundant elsewhere (see bibliography for selected examples). Better understanding of how humans impact the shoreline environment in Hawai'i should help improve the management of field trip sites.

For further information on the directory project or copies of the directory, write to the author or the State DOE/OIS at P.O. Box 2360, Honolulu, Hawai'i 96803.

ACKNOWLEDGMENTS

Although there were scores of individuals involved in the overall project, I would like to especially thank Mr. John Hawkins and Mrs. Colleen Murakami of the State DOE Office of Instructional Services for their valuable contribution to the joint project. Their continued involvement and cooperation were essential in the planning and implementation of the entire project. It was a personal and professional pleasure working with them. Mahalo nui loa.

This conference paper, a product of the "Sea Grant Advisory Service" project (AS/A-1), was sponsored by the University of Hawaii Sea Grant College Program under Institutional Grant No. NA81AA-D-00070 from NOAA Office of Sea Grant, Department of Commerce. University of Hawaii Sea Grant College Program Conference Paper No. UNIHI-SEAGRANT-CP-82-07.

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- _____. 1976. Outdoor education studies K-12: an approach to environmental education (compiled by R. Kubota and P. Groves). Honolulu. (notes: addendum published in 1977)
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- _____. A compendium: coastal field sites in Hawaii. (in preparation).
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Table 1. List of additional coastal field sites (tentative)

A. O'ahu

1. Koko Head/Sandy Beach Park
2. Hanauma Bay
3. Kawaiku'i (Aina Haina) Beach Park
4. Kahala Beach Park
5. Diamond Head Beach Park
6. Waikiki Aquarium Reef
7. Sand Island State Park
8. Mokauea Island
9. Campbell Industrial Park (barge harbor/Malakole Reef)
10. Mokule'ia Beach Park
11. Hale'iwa Beach Park
12. Kea'au Beach Park
13. Lualualei Beach Park
14. Ulehawa Beach Park
15. Wailupe Stream
16. Ala Wai Canal
17. Ahuimanu/Kahalu'u Stream
18. Waimea Bay
19. Pūpūkea Beach ("Three Tables", tidepools, Shark's Cove)
20. Pounder's Beach/Punalu'u Beach
21. Kualoa Regional Park
22. Waiāhole Beach Park
23. King Intermediate School Reef
24. Kaiaka State Recreational Area

B. Maui

1. Mā'alaea Harbor
2. Waiehu Stream Mouth
3. Kanahā Pond
4. Waipu'ilani Reef
5. Ho'okipa Beach Park
6. Hāmoa Tide Pool (Hana)
7. Wai'anapanapa State Park
8. Launiupoko State Wayside Park
9. Lahaina Beach Reef
10. Camp Tecusa (Olowalu)
11. Ka'ehu Beach (Waihe'e)
12. Kanaha Beach Park
13. Maliko Bay
14. Honokōhau Estuary
15. Cape Kīna'u
16. Hāmakua-Poko Papa
17. Maluaka Point
18. West Kū'au Reef

C. West Hawai'i

1. Māhukona County Park
2. Lapakahi State Park
3. Spencer Beach Park
4. Puako Beach Lots
5. 'Anaeho'omalu
6. Pu'uuhonua Hōnaunau National Park
7. Keahole Point
8. South Point (Ka Lae)
9. Old Kona Airport Beach Park
10. Kawaihae Breakwater

D. East Hawai'i

1. Richardson Ocean Center (Keaukaha)
2. Onekahakaha Beach Park
3. Lelewi Beach Park
4. Vacationland Estates (Kapoho)
5. Isaac Hale Beach Park
6. Lili'uokalani Park
7. Laupāhoehoe
8. Harry K. Brown Beach Park
9. Waha'ula Visitor Center, Volcano National Park
10. Kaimū Beach

(Draft: June 2, 1982)

WORKSHEET: O'AHU COASTAL FIELD TRIP DIRECTORY

SITE CODE:

- A. SITE NAME (and synonyms): QUEEN'S BEACH (also Kaloko or Alan Davis Beach).
- B. SITE DESCRIPTION: Uncliffed coast stretching from the crumbling wall, which separates Wawamalu Beach from Kaloko Beach, to the inlet just east of Kalama Stream mouth. Kaloko Beach is a sandy beach fronted by a lava bench and backed by sand dunes. Small tide pools and surge pools form in depressions on the bench. Northeast of Kaloko Beach is Kalama Stream, a natural estuarine pond that was elongated towards the bridge, probably by dredging. The pond is heavily silted and very shallow; a narrow mud flat is exposed during low tide. Northeast of Kalama Stream mouth is a lava shelf and a small inlet with a mangrove swamp at its head. The inlet is also silted and very shallow; the bottom at mangrove swamp is mud flats while the remaining area is silt-covered cobble bottom. The entire site is backed by an area of low relief which is bounded by Koko cones and craters, the dissected Koolau Range and Makapuu Head. The site is makai of Kalaniana'ole Highway just east of Sandy Beach Park. Parking is at Sandy Beach Park or at the unimproved parking lot at Wawamalu Beach just before the bend going towards the Hawaii Kai Golf entrance.
- C. SUITABILITY (age range, grades): 6th grade and up.
- D. WARNINGS (e.g., tides, seasonal swells, currents, dangerous organisms, hidden holes or crevices, etc.): The nearshore waters can be dangerous for swimming--there is no protective reef offshore so currents can be strong at times; the water depth also drops abruptly near the shore. The typical shoreline hazards occur here. The outer edge of the bench is wave-exposed.
- On land, beware of reckless trailbikers, broken glass, the "thorn" of puncture vine, deep spots and slippery rocks in the stream. The area is hot, dry, windy and with little shade; be prepared for blowing sand. Nude sunbathers once frequented the area, but they seem to have left.
- E. ARRANGEMENTS:
1. CONTACT PERSON/PHONE: KACOR Development Company (395-2331)
 2. PERMISSION/CLEARANCE: Land above the vegetation line and the portion of Kalama Stream that was dredged is private property. Permission must be cleared with KACOR Development Company (395-2331). Liability waiver required for all field trip participants.
 3. CLEARANCE TIME: Normally one or two weeks, depending on how quickly you can get the liability waivers signed by all the participants/guardians and turn it in to KACOR Development Company.
- F. FACILITIES:
1. PARKING/RESTROOMS: Parking and restrooms at Sandy Beach Park. Unimproved parking lot at Wawamalu Beach.

2. EMERGENCY INFORMATION (lifeguards, telephone...) Lifeguards and telephone at Sandy Beach Park.
3. SPECIAL RESTRICTIONS (handicapped, elderly...) No facilities at Kaloko Beach as well as Wawamalu Beach.

G. DESCRIPTION OF RESOURCES:

1. TYPES OF ENVIRONMENTS (1-excellent; 2-present; 3-potential; 0-none)

1	beach	3	estuary
1	tidepools/intertidal	0	anchialine pool
2	wetland	0	reef flat
0	stream	3	mud flat
1	strand	1	other:
			marine basalt bench
			unique with no off-shore reef
		2	mangrove swamp

2. NOTEWORTHY FEATURES:

- a. physical/geological: Koko fissure; gypsum (dollars or buttons) in Kealakupapa Valley; layering of wind-stratified sand; geological/physiographic landmarks; rift zone, cones and crater, Kalama lava flow, valley fill, sand dunes, beach rock, beaches, valleys, ridges and divides, gaps, sea cliffs, headlands, benches and tidal flats, and estuaries.
- b. biological/ecological: Variety of coastline ecosystems (e.g., coastal scrub on sand dunes, coastal herbs on basalt rocks, mangrove swamp, coastal marsh, and seasonally dry scrub-grassland); variety of shoreline and nearshore ecosystems (e.g., estuary, sandy beach, basalt benches, marine pools, mangrove swamp and wave surge coral communities); wetland feeding area for shorebirds; seabird seasonal flyway; endangered Hawaiian cotton.
- c. cultural/historical; Queen's Beach controversy; recreational uses (e.g., shore fishing, offshore fishing, aquarium fish netting, spear fishing, sunbathing, nature walks, board surfing, and trail bikes); and concrete wall remains of Davis' ranch home that was destroyed by the tsunami of 1946.

H. SUGGESTED ACTIVITIES:

a. 6th Grade:

1. Comparative studies of limu, native coastal plants, coral and birds.
2. Study of rare and endangered species such as the Hawaiian cotton.

b. 7-9th Grade:

1. Geological processes studies - formation of the coastline by waves and currents, running water, wind, and volcanic action.
2. Discussion of 1946 Tsunami.
3. Study of the life stages of Hawaiian volcanoes.

c. 10-12th Grade:

1. Study of modern man's impact on the coastal environments.
2. Study in the use of adaptive strategies by organisms.
3. Plant succession.
4. Zonation and marine organisms.
5. Geological process studies.

Rare and endangered species studies with the Hawaiian cotton as an example. Studies on modern man's impact on the coastal environment and how he uses it.

- I. PREPARATIONS (e.g., footwear, dress, equipment, supplies, etc.): Wear comfortable and appropriate shoes for walking on sand or rocks on the coastline; tabi or sneakers recommended for bench walking and wading. Bring along sunscreen, hat, chapstick and sunglasses for protection from the strong sun and winds.

J. SUGGESTED READINGS (author, title, year, publisher):

- Bloom. Chapter on "Shore-Zone Processes and Landforms" IN Geomorphology: A Systematic Analysis of Late Cenozoic Landforms. Prentice-Hall, Inc.
- Hwang. Beach Changes on Oahu as Revealed by Aerial Photographs. Dep. of Planning and Economic Development, State of Hawaii.
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- Manhoff and Uyehara. Rockhounding in Hawaii. Hawaiiana Almanac Publishing Company.
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- Stearns. An Island is Born. By the Author.
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- Maragos. Order Scleractinia: Stony Corals IN Reef and Shore Fauna of Hawaii, Section I: Protozoa through Ctenophora, Devaney and Eldredge (eds.), pp. 158-241.
- Clark. The Beaches of O'ahu. The University Press of Hawaii.
- Handy and Handy. Native Planters in Old Hawaii: Their Life, Lore, and Environment. Bishop Museum Press.
- K. *OTHER RESOURCE MATERIALS (slide shows, videotapes, species lists, etc.):
- "Na Mea Ulu Ma Kahakai o Hawaii" (Hawaii's native coastal plants slide-tape show) produced by UH Sea Grant College Advisory Program. 20 min.
- L. SUGGESTED RESOURCE PERSONS:
- Ed Arrigoni, Kaiser High School (general)
 - Alyce Ikeoka (minerals)
 - Les Matsuura, Waikiki Aquarium (marine life)
 - Ralph Saito, Div. of Foresty & Wildlife (birds)
 - Wayne Souza, Div. of State Parks (general)
 - Ray Tabata, UH Sea Grant Advisory Services (general)
 - Walter Ziegler (history)
- M. OTHER COMMENTS:

