

**THE THIRTIETH LEGISLATURE
APPLICATION FOR GRANTS
CHAPTER 42F, HAWAII REVISED STATUTES**

Type of Grant Request:

Operating

Capital

Legal Name of Requesting Organization or Individual: Db:

Hawaii Nature Center

Amount of State Funds Requested: \$ 136,840.00

Brief Description of Request (Please attach word document to back of page if extra space is needed):

Funding to continue to offer partial subsidies to 7,500 Title One K-Middle School students to engage in place-based environmental education on Oahu and Maui.

Amount of Other Funds Available:

State: \$ 136,840.00

Federal: \$ _____

County: \$ _____

Private/Other: \$ 566,392.00

Total amount of State Grants Received in the Past 5

Fiscal Years:
\$ 500,000.00

Unrestricted Assets:

\$ 2,505,800.00

New Service (Presently Does Not Exist):

Existing Service (Presently in Operation):

Type of Business Entity:

501(C)(3) Non Profit Corporation

Other Non Profit

Other

Mailing Address:

2131 Makiki Heights Dr

City: State: Zip:

Honolulu HI 96822

Contact Person for Matters Involving this Application

Name:
Todd Cullison

Title:
Executive Director

Email:
todd@hawaiinaturecenter.org

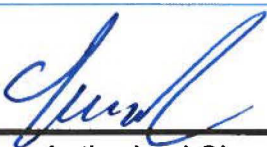
Phone:
808-955-0100

Federal Tax ID#:

██████████

State Tax ID#

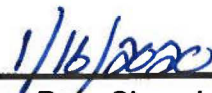
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Authorized Signature

Todd Cullison, Executive Director

Name and Title



Date Signed

received
01/16/2020



HAWAII NATURE CENTER

Connecting children and families to nature

We foster awareness, appreciation, understanding and stewardship of Hawai'i's environment by educating children with an interactive and immersive approach.

January 16, 2020

2020 Board of Directors

Eric Wright
President

Guy Churchill
Treasurer

Randall Sakumoto
Secretary

Piia Aarma
2017 - 2019 President

State Capitol, Rm. 208
Honolulu, HI 96813
Attn: GIA

Pōhai Nu'uhiwa Campbell
Tran Chinery
Meleana Estes
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G. Robert Johnston
Dee Dee Letts
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Staff

Todd Cullison
Executive Director

Application Submittal Checklist

The following items are required for submittal of the grant application. Please verify and check off that the items have been included in the application packet.

- 1) Certificate of Good Standing (If the Applicant is an Organization)
- 2) Declaration Statement
- 3) Verify that grant shall be used for a public purpose
- 4) Background and Summary
- 5) Service Summary and Outcomes
- 6) Budget
 - a) Budget request by source of funds ([Link](#))
 - b) Personnel salaries and wages ([Link](#))
 - c) Equipment and motor vehicles ([Link](#))
 - d) Capital project details ([Link](#))
 - e) Government contracts, grants, and grants in aid ([Link](#))
- 7) Experience and Capability
- 8) Personnel: Project Organization and Staffing


AUTHORIZED SIGNATURE

TODD CULLISON, EXECUTIVE DIRECTOR
PRINT NAME AND TITLE


DATE

Application for Grants

If any item is not applicable to the request, the applicant should enter "not applicable".

I. Certification – Please attach immediately after cover page

1. Certificate of Good Standing (If the Applicant is an Organization)

If the applicant is an organization, the applicant shall submit one (1) copy of a certificate of good standing from the Director of Commerce and Consumer Affairs that is dated no earlier than December 1, 2019.

See Appendix A

2. Declaration Statement

The applicant shall submit a declaration statement affirming its compliance with Section 42F-103, Hawaii Revised Statutes. ([Link](#))

See Appendix B

3. Public Purpose

The applicant shall specify whether the grant will be used for a public purpose pursuant to Section 42F-102, Hawaii Revised Statutes. ([Link](#))

Yes, Hawai'i Nature Center's, *Creating the Next Generation of Environmental Stewards by Reducing Screen Time and Increasing Green Time* grant will be used for a public purpose by connecting Hawai'i Department of Education student to nature across Maui and O'ahu. The funds will maximize environmental education program impacts on Hawai'i's keiki as they become environmentally literate members of the community striving to mālama 'āina.

II. Background and Summary

This section shall clearly and concisely summarize and highlight the contents of the request in such a way as to provide the State Legislature with a broad understanding of the request. Please include the following:

1. A brief description of the applicant's background;

Established in 1981, the Hawai'i Nature Center (HNC) is a 501(c)(3) non-profit organization has been a leader in environmental education in Hawai'i for 39 years with more than one million children and adults participating in our programs since inception.

Our mission is to: *foster awareness, appreciation, understanding, and stewardship of Hawai'i's environment by educating children with an interactive and immersive approach.*

HNC connects nearly 20,000 children and families on Maui and O'ahu each year to nature, to encourage environmental stewardship through hands-on investigative field study and experiences. HNC also provides weekend family and community programs, environmental education themed birthday parties, and Nature Adventure Camp during school intersessions. Educational programs are conducted outdoors, exposing children to watershed science, forest, marsh and coastal environments, sustainability concepts and changes in behaviors to improve environmental conditions. Each year, children and families spend over 70,000 hours total in nature via HNC programs.

Hawai'i Nature Center has strong community partnerships on both islands and stands as Hawai'i's leading environmental education organization. Chief among the supporters are the schools and teachers who participate in our science-based programs implementing the Next Generation Science Standards that are aligned with current state and federal science standards. Additional supporters include several private foundations, non-profit organizations and government agencies. Lastly, HNC has an active group of more than 750 volunteers across both islands who contributed 5,415 hours of service in 2018.

Our goal with this request is to continue our work inspiring keiki on Oahu and Maui to be the next generation of environmental stewards. In 1997, researchers asked thirty-four 9 and 10 year olds, forty-eight 13 and 14 year olds and forty-six adults 20 years and older a series of questions about field trips taken in first, second and third grade. Overall, 96% of all subjects could recall a field trip. The most frequently recalled field trip was to natural site and nature centers (26.6%).¹ This request will support lessons learned at Hawai'i Nature Center that will last far beyond the initial experience with us, as many of our previous students have become Junior Leaders (volunteer educators) and leaders in other environmental causes.

2. The goals and objectives related to the request;

The funding request for, *Creating the Next Generation of Environmental Stewards by Reducing Screen Time and Increasing Green Time* include the following goals and objectives:

The program's ultimate goal is to inspire an environmental stewardship ethic among Hawai'i's citizens that will protect and sustain the finite natural systems upon which we all depend. Specific goals include:

¹ Dierking, L.H. & Falk, J.H. (1997) School Field Trips: Assessing Their Long-Term Impact

- Raise student awareness about the uniqueness, finite nature and value of our islands' watersheds, forests, marshes or coastal ecosystems that are essential to our environmental and economic wellbeing;
- Facilitate learning experiences that forge a child's affective response to nature, construct understanding about the dynamic ecological relationships found in nature and the causal effects of humans; and develop a child's capacity for critical thinking and cooperative problem-solving; and,
- Engage learners in the practice of environmental stewardship/community service.

Specific objectives include:

- Connect 7,500 Title One² elementary and middle school students on O'ahu and Maui to nature via our school programs. The number of children reached will include multi-touch programs utilizing curriculum based on Next Generation Science Standards (NGSS) aligned with the Department of Education state standards.
- Connect with 150 Title One Schools
- 26,250 cumulative hours of reduced screen time and increased screen time

3. The public purpose and need to be served;

Hawai'i Nature Center provides a public purpose to create the next generation of informed and educated environmental stewards. This is accomplished via a hands-on, immersive, interactive approach to learning about mālama 'aina and furthering public awareness and understanding the important role that we each have in caring for our islands' scarce resources.

HNC understands there are many approaches to address environmental problems spanning from regulation, restoration and conservation. HNC believes in the efficacy of science-based environmental education and that one of the best ways to understand, restore and protect Hawai'i's natural resources are to see, touch, smell, interact with, and learn from, nature. In 2018, a group of researchers at Stanford University conducting a systematic analysis of peer-reviewed research found that environmental education (EE) teaches children about much more than science and the environment. Its emphasis on higher-order thinking can help develop academic skills such as critical

² The Department's list of Title I schools is reported as schools that have a minimum poverty threshold of 47.2%. Poverty is determined via family enrollment in two federal programs — [Community Eligibility Provision](#) and the [Free & Reduced Lunch Program](#) — during the prior school year.

thinking, decision-making, and systems thinking. It can help produce lifelong learners and effective problem solvers.³

4. Describe the target population to be served; and

The target population are keiki kindergarten, elementary and middle school students from Title One schools on Maui and O'ahu.

In 2018, HNC connected with 103 schools on O'ahu and 25 on Maui for 326 individual educational programs. Of these students, 7,300 keiki were from Title One schools. These schools understand the educational value in our programs and even with limited financial resources booked for more than one session for a total of 147 visits in 2018.

5. Describe the geographic coverage.

The geographic coverage for these programs include the Maui and O'ahu communities at large. On Oahu in 2018, HNC connected with 103 school and 25 on Maui representing every complex area served by the Department of Education on those two islands.

III. Service Summary and Outcomes

The Service Summary shall include a detailed discussion of the applicant's approach to the request. The applicant shall clearly and concisely specify the results, outcomes, and measures of effectiveness from this request. The applicant shall:

1. Describe the scope of work, tasks and responsibilities;
Scope of Work

Hawai'i Nature Center offers environmental education programs that connect children and youth to different ecosystems and provides invaluable experiences to learn environmental science while exploring these ecosystems in a natural, outdoor setting.

HNC will introduce learners to basic environmental concepts and principles, offer a cultural context in which to understand ahupua'a management practices, and raise awareness about environmental issues facing our communities. The programs will introduce teachers and children to natural places on O'ahu and Maui and broaden their experience with publicly managed natural resources; as well as engage students and teachers in a stewardship activity that facilitates actions for mālama 'āina.

See Appendix C for sample curriculum.

³ Nicole M. Ardoin, Alison W. Bowers, Noelle Wyman Roth & Nicole Holthuis (2018) Environmental education and K-12 student outcomes: A review and analysis of research, The Journal of Environmental Education, 49:1, 1-17, DOI: 10.1080/00958964.2017.1366155

Environmental Educators Tasks & Responsibilities:

- Conduct HNC environmental education school programs
- Assist in developing environmental education materials
- Develop and maintain educational resources, props and exhibits
- Conduct teacher planning sessions and workshops
- Recommend educational program curriculum for schools
- Network with other programs and environmental organizations

Education Program Manager Tasks & Responsibilities

- Supervise environmental educators
- Plan the registration process and oversee development of packets
- Schedule school program experience and reschedule as needed (rainy days)
- Assist in reviewing and revising curriculum packets accordingly
- Train and supervise environmental educators and fill in on-site as needed
- Gather and analyze teacher evaluations and assess student submissions

2. Provide a projected annual timeline for accomplishing the results or outcomes of the service;

Activities Timeline: 2020-2021 Summer/Fall/Winter/Spring school and intersession periods (depending on when funding is awarded/received)

Target Audience: 7,500 Oahu and Maui elementary and middle school children within the State of Hawai'i Department of Education system.

Preparation Phase (July/August/September 2020)

- Recruit O'ahu and Maui public school groups for the 2020-2021 DOE Calendar Year during our registration period.
- Conduct teacher conferences held at either HNC's main educational facility or the selected outdoor field site, where the teachers are trained in the lessons, concepts and activities that will teach and engage their students in the lesson objectives before and after the field trip. Provide teachers with an orientation and resource packet as well as technical assistance if needed.

Action and Reflection Phase (October 2020 - July 2021)

- Provide hands-on investigative programs that meets Hawai'i Content and Performance Standards in Science—Domain I and Domain II; Social Studies—History, Geography and Cultural Anthropology; Career & Life Skills—Technological Literacy and Skills for Life and Work
- Meet learner outcomes that include describing the components and ecological relationships found in the wetland, riparian woodland or coastal habitats; and describing ways that humans can have a positive, neutral and negative impact on habitats

- Facilitate an environmental stewardship activity for each group that is appropriate for audience ability and setting (e.g., garbage pick-up, removing invasive plants or planting native plants)
 - To reinforce the scientific concepts learned, the teachers will be encouraged to assign their students essays and/or activities in a reflection phase to recount their experiences. Evaluation sheets will also be distributed to teachers as well
3. Describe its quality assurance and evaluation plans for the request. Specify how the applicant plans to monitor, evaluate, and improve their results; and

Evaluation is built into every aspect of HNC's programming. Our measure of success is derived from two primary sources: the teacher/parent evaluations and student pre-program tests and post-program tests. First, teachers/parents complete a written evaluation after their visit to HNC offering feedback about all aspects of our program, including quality of instruction and program content. Second, for many programs, each attendee also completes a pre- and post-test that HNC uses to measure the effectiveness and level of information gained as a result of our programs. In addition, regular staff performance is monitored and evaluated through procedures that include verbal feedback by the employee's supervisor, annual written evaluations and annual self-evaluations.

These many evaluations are compiled and reviewed by supervisors and teaching staff, and analyzed at the end of each month to identify training and program development opportunities; comments requiring immediate attention are handled promptly by the Program Manager, Program Coordinator, and Executive Director. Taken together, these verify the value and effectiveness of our program and our educators in connecting these individuals to nature. Even with these many methods of quantitative measurement, program success is best seen during the program day, as we observe participants getting involved in exciting, hands-on activities, and sharing their enthusiasm for the ways they can care for the world around them.

4. List the measure(s) of effectiveness that will be reported to the State agency through which grant funds are appropriated (the expending agency). The measure(s) will provide a standard and objective way for the State to assess the program's achievement or accomplishment. Please note that if the level of appropriation differs from the amount included in this application that the measure(s) of effectiveness will need to be updated and transmitted to the expending agency.

Effectiveness of the *Creating the Next Generation of Environmental Stewards by Reducing Screen Time and Increasing Green Time* will be measured qualitatively and quantitatively through pre- and post-tests and teacher evaluation. These evaluations measure the effectiveness of the programs and educators, as well as student take-aways from the program and their level of connectedness to nature. In addition, anecdotal and formative evidence provided by the teachers/parents and participants during the program will offer information about the observed attitudes, behaviors, and

engagement of the participants. HNC will also provide the State Agency with a list of schools that attended programs, what program they attended, how many students, and the date of the program. This will ensure that the funds were expended appropriately and reflect how vulnerable populations were able to benefit from the GIA request.

We expect that summative evaluations provided by teachers/parents (of their students) will validate:

- 1) The effective use of structured, hands-on, experiential activities and play to engage participants in learning and relaxing,
- 2) That participants exhibit positive social interactions with their peers and positive associations with nature in the outdoor learning environment, and
- 3) That the field trip will build positive associations with nature and an environmental stewardship ethic that students perform in their daily lives.

Overall, the written, summative evaluations collected from teachers and participants after the program will gauge how well expectations and learner outcomes were met.

IV. Financial

Budget

1. The applicant shall submit a budget utilizing the enclosed budget forms as applicable, to detail the cost of the request.
 - a. Budget request by source of funds ([Link](#))
 - b. Personnel salaries and wages ([Link](#))
 - c. Equipment and motor vehicles ([Link](#))
 - d. Capital project details ([Link](#))
 - e. Government contracts, grants, and grants in aid ([Link](#))
2. The applicant shall provide its anticipated quarterly funding requests for the fiscal year 2021.

Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total Grant
37,960	32,960	32,960	32,960	136,840

3. The applicant shall provide a listing of all other sources of funding that they are seeking for fiscal year 2020.

Alexander & Baldwin
 Atherton Family Foundation
 First Foundation
 Fred Baldwin Memorial Foundation
 Friends of Hawaii Charities
 Hau'oli Mau Loa Foundation

Multiple private donors

4. The applicant shall provide a listing of all state and federal tax credits it has been granted within the prior three years. Additionally, the applicant shall provide a listing of all state and federal tax credits they have applied for or anticipate applying for pertaining to any capital project, if applicable.

Not applicable.

5. The applicant shall provide a listing of all federal, state, and county government contracts, grants, and grants in aid it has been granted within the prior three years and will be receiving for fiscal year 2021 for program funding.

•Capital Improvement Project GIA (FY 2018-2018) Grant Contract #: 68192, State of Hawai'i, DLNR

6. The applicant shall provide the balance of its unrestricted current assets as of December 31, 2019.

\$2,505,800

V. Experience and Capability

1. Necessary Skills and Experience

The applicant shall demonstrate that it has the necessary skills, abilities, knowledge of, and experience relating to the request. State your experience and appropriateness for providing the service proposed in this application. The applicant shall also provide a listing of verifiable experience of related projects or contracts for the most recent three years that are pertinent to the request.

Hawai'i Nature Center has been offering environmental education experiences to O'ahu and Maui residents and visitors for 39 years. We are an equal opportunity employer with a staff of 15 FTE. All staff are required to have a college degree and/or equivalent experience, background checks and safety certifications.

Hawai'i Nature Center currently manages a budget of approximately \$1 million. These funds come from a variety of sources, including Hau'oli Mau Loa Foundation, Alexander & Baldwin, Atherton Family Foundation and many private donors. Taken together, these diverse funding streams come together to support the organization's primary mission of connecting children and families to nature.

Governance of HNC is done via an 14 member Board of Directors following best practices including an annual financial review via a Hawai'i CPA firm.

Lastly, HNC is led by Executive Director Todd Cullison. Mr. Cullison held a variety of roles in environmental non-profits since 1998. Positions have included Environmental Education Program Manager, Watershed Program Director, Director of Development and over 10-years as Executive Director for two different entities. Mr. Cullison is supported by a management team comprised of an Operations and Volunteer Program Director and Education Program Manager. Together, this team oversees and manages all day-to-day operations of programs, facilities, and personnel on Maui and O'ahu.

2. Facilities

The applicant shall provide a description of its facilities and demonstrate its adequacy in relation to the request. If facilities are not presently available, describe plans to secure facilities.

The Hawai'i Nature Center O'ahu Campus is located at 2131 Makiki Heights Drive, Honolulu, Hawai'i. This property is leased to HNC from State Parks. The Maui Campus is located at 875 'Iao Valley Road, Wailuku, Hawai'i. This land is owned by HNC. As the program operator at both sites, HNC staff oversee and execute all necessary building maintenance and land upkeep. Facilities on both O'ahu and Maui include displays and activities that complement the environmental education programs. While these specifically target school groups, they also serve families and community groups as well as weekend and intersession program participants. In cases where care is larger-scale or on property not owned by HNC, maintenance is requested and coordinated through the HNC with the appropriate agencies, such as Division of Forestry and Wildlife, Honolulu City & County, Board of Water Supply, and others. In addition to HNC's facilities, the agency has partnerships and maintains positive relationships with several other parks and organizations, including multiple sites owned by US Fish and Wildlife Service which allow HNC to host programs, giving our organization a broader reach geographically and programmatically. Additional sites on Maui and O'ahu include:

- USFWS Keālia Pond National Wildlife Refuge (Maui)
- Maui Nui Botanical Gardens (Maui)
- Maui Tropical Plantation (Maui)
- Ka'a Point (Maui)
- Materials Recovery Center (Maui)
- Makiki Valley Watershed (O'ahu)
- Pu'u 'Ualaka'a State Park (O'ahu)
- USFWS Honouliuli National Wildlife Refuge (O'ahu)
- Waimānalo Beach Park (O'ahu)
- Kawainui-Hāmākua Marsh Complex (O'ahu)

VI. Personnel: Project Organization and Staffing

1. Proposed Staffing, Staff Qualifications, Supervision and Training

The applicant shall describe the proposed staffing pattern and proposed service capacity appropriate for the viability of the request. The applicant shall provide the qualifications and experience of personnel for the request and shall describe its ability to supervise, train and provide administrative direction relative to the request.

Staffing:

The primary proposed staff for *Creating the Next Generation of Environmental Stewards by Reducing Screen Time and Increasing Green Time* will be those educators and manager already employed and trained up with HNC. The educators who will implement and oversee programming for have a combined 30 years of experience as environmental educators. Their passion for the mission and to ensuring each keiki has a fun educational experience is unmatched. Overall project management will be conducted by Executive Director Todd Cullison, Environmental Educators will have director oversight via our Maui Program Coordinator and Education Program Manager.

Please refer to Appendix D for complete copies of resumes for these employees.

Supervision & Training:

Curriculum enhancement and scheduling of school bookings will be the primary focus of the first six months of the grant award. This training will include increasing awareness and expectations of how to engage these underserved populations.

HNC will continue to monitor and evaluate its employee's performance as it has in the past, with annual performance evaluations. In addition to this formal and written review process, the Program Manager and Coordinator have bi-weekly meetings with head administrative staff to discuss questions, issues, or to address other programmatic needs. This continual process spotlights best practices and lifts the overall performance of the teaching community.

2. Organization Chart

The applicant shall illustrate the position of each staff and line of responsibility/supervision. If the request is part of a large, multi-purpose organization, include an organization chart that illustrates the placement of this request.

See Appendix E

3. Compensation

The applicant shall provide an annual salary range paid by the applicant to the three highest paid officers, directors, or employees of the organization by position title, not employee name.

Executive Director - \$90,000/year

Maui Program Coordinator - \$45,000/year

Education Program Manager - \$42,000/year

VII. Other

1. Litigation

The applicant shall disclose any pending litigation to which they are a party, including the disclosure of any outstanding judgement. If applicable, please explain.

Not applicable

2. Licensure or Accreditation

The applicant shall specify any special qualifications, including but not limited to licensure or accreditation that the applicant possesses relevant to this request.

No applicable

3. Private Educational Institutions

The applicant shall specify whether the grant will be used to support or benefit a sectarian or non-sectarian private educational institution. Please see [Article X, Section 1, of the State Constitution](#) for the relevance of this question.

No applicable

4. Future Sustainability Plan

The applicant shall provide a plan for sustaining after fiscal year 2020-21 the activity funded by the grant if the grant of this application is:

- (a) Received by the applicant for fiscal year 2020-21, but
- (b) Not received by the applicant thereafter.

This GIA will fill the gap from previously lost revenue on Maui as a result of the 'Īao Valley floods and lack of functioning facilities for part of this same timeframe, during which HNC's O'ahu program revenue subsidized Maui programs to keep Maui keiki's connection to nature alive. The Hawai'i Nature Center has long demonstrated its expertise in providing quality programs and services to Hawai'i's children, families and community members from both the islands and national and international visitors. We are in the process of building additional partnerships on both islands and beginning to create a more robust fee for service program by engaging island visitors to Oahu. In addition we have continued financial success from Hawai'i Nature Center's annual Green Gala fundraising, expanded individual philanthropic supporting via major gifts and increased program fees.

ATTACHMENTS

Appendix A: Certificate of Good Standing

Appendix B: Chapter 42F Declaration Statement

Appendix C: Sample Curriculum

Appendix D: Staff Resumes

Appendix E: Organizational Chart

Appendix F: Budget

Appendix G: Board of Directors



**STATE OF HAWAII
STATE PROCUREMENT OFFICE**

CERTIFICATE OF VENDOR COMPLIANCE

This document presents the compliance status of the vendor identified below on the issue date with respect to certificates required from the Hawaii Department of Taxation (DOTAX), the Internal Revenue Service, the Hawaii Department of Labor and Industrial Relations (DLIR), and the Hawaii Department of Commerce and Consumer Affairs

Vendor Name: HAWAII NATURE CENTER, INC.

DBA/Trade Name: HAWAII NATURE CENTER, INC.

Issue Date: 01/09/2020

Status: Compliant

Hawaii Tax#: 20337722

New Hawaii Tax#:

FEIN/SSN#: XX-XXX8246

UI#: XXXXXX0917

DCCA FILE#: 47682

Status of Compliance for this Vendor on issue date:

Form	Department(s)	Status
A-6	Hawaii Department of Taxation	Compliant
	Internal Revenue Service	Compliant
COGS	Hawaii Department of Commerce & Consumer Affairs	Exempt
LIR27	Hawaii Department of Labor & Industrial Relations	Compliant

Status Legend:

Status	Description
Exempt	The entity is exempt from this requirement
Compliant	The entity is compliant with this requirement or the entity is in agreement with agency and actively working towards compliance
Pending	The entity is compliant with DLIR requirement
Submitted	The entity has applied for the certificate but it is awaiting approval
Not Compliant	The entity is not in compliance with the requirement and should contact the issuing agency for more information

Appendix: B GOVERNMENT CONTRACTS, GRANTS, AND / OR GRANTS IN AID

Applicant: Hawaii Nature Center

Contracts Total: 515,000

	CONTRACT DESCRIPTION	EFFECTIVE DATES	AGENCY	GOVERNMENT ENTITY (U.S. / State / Haw / Hon / Kau / Mau)	CONTRACT VALUE
1	Capital Improvements at HNC Oahu and Maui locations	NTP: 11/22/2019	DLNR (#68192)	State	500,000
2	Envrionmental Education: Recycling Afterschool Program	FY 2020	Maui County	Maui	15,000
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GRADE
2



O'AHU



GRADE

2

Hawai'i Nature Center
Environmental Education Field Program

Teacher's Resource Guide

Cycles in Nature

August 2018
Hawai'i Nature Center

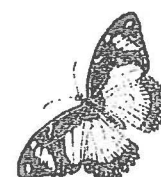
Statewide Office:
2131 Makiki Heights Drive
Honolulu, Hawai'i 96822
Phone: (808) 955-0100 Fax: (808) 955-0116
Website: www.hawaiinaturecenter.org



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Cycles in Nature



Foreword

Note to Teacher:

This Resource Guide is provided to assist classroom teachers planning to bring their students to the Hawai'i Nature Center's Grade 2 Program, *Cycles in Nature*. It includes an outline of the program's key concepts, goals and objectives, and brief descriptions of the various activities in which students may participate. There are also suggestions for pre-visit preparation and post-visit follow up, scientific background, an annotated reference list, and a sample letter to send home to parents.

Leading early childhood specialists underscore the value of direct experiences for children. Moreover, many noted scientists attest that their commitment to the environment can be traced back to outdoor activities in childhood, and the guidance of an interested adult. We believe that a Hawai'i Nature Center field trip is far more than just child's play, and may be the start of a lifelong connection between students and the natural world.

We are delighted that you have elected to bring your students to visit us, and look forward to a wonderful day in the great, green out-of-doors. Please call us at 955-0100 if you have any questions about your visit.

Cycles in Nature



Program Lessons & Activities

PROGRAM OVERVIEW

Key Concepts: The natural world works in cycles. Cycles in nature interact with one another; they are interconnected. There are many different kinds of plants and animals that live in Hawaii's lowland forest and stream habitats. Biodiversity is critical to the health of people and the environment. We can all work together to help maintain nature's natural ability to sustain life and create balance.

Goals: To foster an awareness and appreciation of nature, with emphasis on natural, biological and physical cycles; to expose students to the common plants and animals found in present lowland Hawaiian forest and stream environments. To gain an understanding of the connection between biodiversity and the health of people and the planet.

Objectives: Students will be able to describe the life cycle of flowering plants with emphasis on the dependence of animals for pollination and seed dispersal. Students will describe the water cycle, the different states of water and identify where water is found on Earth. They will express an understanding of the nutrient cycle, observe the diversity of decomposers found in the soil and explain their importance. Students will also be able to make observations about the different kinds of life found in Hawaii's forest and stream environments, and be able to explain the importance of biodiversity.

Next Generation Science Standards (NGSS) *more details on page 9.

Science Practices:

- Asking Questions
- Planning and Carrying Out Investigations
- Analyzing and Interpreting Data
- Constructing Explanations and Designing Solutions
- Obtaining, Evaluating, and Communicating Information

Disciplinary Core Ideas:

- LS2.A: Interdependent Relationships in Ecosystems
- LS4.D: Biodiversity and Humans
- ESS2-C: The Roles of Water in Earth's Surface Processes

Crosscutting Concepts:

- Cause and Effect.
- Structure and Function.
- Patterns

PROGRAM SCHEDULE

9:00 - 9:30	Introduction to Cycles in Nature
9:30 - 10:15	Field Activities: 1st rotation
10:15 - 11:00	Field Activities: 2nd rotation
11:00 - 11:45	Field Activities: 3rd rotation
11:45 - 12:15	Lunch
12:15 - 12:30	Terrarium Building/Recycling/Composting and Summary

INTRODUCTION

Key Concepts:

1. The natural world works in cycles; cycles help to keep nature in balance.
2. The forest and stream are home to many different kinds of plants and animals.
3. Biodiversity is critical for the health of the forest and stream habitats.

Objectives:

Students will be able to:

1. Describe five cycles in nature.
2. Identify examples of plants and animals found in forest, soil, and stream habitats.
3. Explain the importance of biodiversity.



Activity: Hawai'i Nature Center staff introduce students to five of the main cycles in nature through an interactive game while establishing important vocabulary and other key concepts to be covered throughout the day. Afterwards, the class will break into smaller groups to begin the field activities. During their field explorations, students are asked to consider ways in which the various cycles work together.

MORNING FIELD ACTIVITIES (three rotations)

Water Cycle and Stream Biodiversity

Key Concepts:

1. Water is constantly moving from one place to another and from one state to another.
2. Compared to saltwater on the planet, there is very limited freshwater available for human use.
3. The freshwater stream is home to many different kinds of plants and animals.
4. We must conserve and take care of our freshwater resources; water is life!

Objectives:

Students will be able to:

1. Explain how water changes from one state to another (liquid, solid, gas) throughout the water cycle.
2. Identify where freshwater can be found on Earth and describe where we get our drinking water from on the island of O'ahu.
3. Identify at least three organisms that can be found in Hawaii's freshwater stream.
4. Describe ways we can help to care for our freshwater sources.

Activity: Students will gather at the edge of Makiki Stream to review the water cycle and the different states of water (solid, liquid, gas) with the help of colorful props. Through an interactive demonstration, students will learn where water is found on Earth with emphasis on the difference between the amount of saltwater versus the limited amount of freshwater available for human use. After the brief introduction, students will explore the stream using dip nets and buckets to discover the plants and animals in Makiki stream. They'll assess the health of the stream based on the diversity of life. Before leaving the stream, students will be asked to consider ways they can help conserve freshwater sources and maintain the health of the stream.

Nutrient Cycle & Decomposer Diversity

Key Concepts:

1. Nutrients are recycled through plants with the help of decomposers.
2. Decomposers include bacteria, fungi, and animals such as worms, termites, and ants.
3. Soil biodiversity is a critical for the health of the forest habitat.

Objectives:

Students will be able to:

1. Explain the process of nutrient cycling.
2. Identify important decomposers in the forest and describe their role in the nutrient cycle.
3. Explain the connection between soil biodiversity and the health of the forest.

Activity: At first glance, this forest is home to little more than bushes and trees. Sitting in a log circle under the canopy of the forest, the HNC educator will lead the students through an interactive overview of the nutrient cycle. As investigative scientists, students will use bug jars and brushes to search the damp soil for hidden organisms that break down fallen branches and leaves and make it possible for the towering forest to exist. Students will assess the diversity of life found among the decomposers in the soil habitat and discover the important connection between biodiversity and the health of the forest.



Plant Life and Gas Cycles

Key Concepts:

1. The life cycle of a flowering plant includes the production of a flower, fruit, seed, sprout, seedling, sapling, and mature tree.
2. Plants need water and sunlight to grow.
3. Plants depend on animals for pollination and seed dispersal.
4. Plant and animal diversity are important for the health of the forest.

Objectives:

Students will be able to:

1. Describe the life cycle of flowering plants.
2. Identify what plants need to grow and survive.
3. Explain the importance of animals for pollination and seed dispersal.
4. Identify examples of pollinators and animals that disperse seeds in Hawaii's forests.

Activity: Most of us know that seeds sprout seedlings, but where do the seeds come from? With fun interactive costumes, we'll role play the life cycle of flowering plants, emphasizing the role of animals in pollination and seed dispersal. We'll then proceed on a treasure hunt through the forest, looking for various plants, identifying plant parts and the diversity of pollinators. Along the trail, we'll stop to pay our respect to the towering trees as we discover the important interaction among plants and animals in the gas cycle.

AFTER LUNCH ACTIVITIES

Terrarium-Building

Throughout the day students will have collected parts of each of the five cycles in nature. We'll add soil from the forest to your jar along with gravel and work together to create a class terrarium. Students will add water collected from the stream, decomposing plant material, seedlings, and even some decomposers from the forest. In the end, you'll have a mini Makiki Valley to take back to your classroom - the perfect souvenir to remind you of how all the cycles work together in nature.

Recycling & Composting (if time permits)

Students will sort their trash into HNC's various recycling bins and contribute all vegetarian lunch scraps to our worm bin and/or compost pile. All non-recyclables, alas, must be taken back to school.

SUMMARY

Key Concepts:

1. Cycles in nature are interconnected; we (people) are part of these natural cycles.
2. Biodiversity is critical for the health of people and the planet.
3. There is a finite supply of natural resources on Earth. We must follow nature's example and recycle what we use to ensure that we always have the food, water, and raw materials that we need.

Objectives:

Students will be able to:

1. Describe how natural cycles relate to one another.
2. Explain the importance of biodiversity for the health of people and the planet.
3. Identify ways we can help to take care of nature, including the conservation of water and biodiversity.

Activity: The Program Coordinator will present the five giant cycles created in the morning introduction. Together, we'll review the cycles and discuss their interdependence based on observations in the field. The group will end with a discussion on various ways to emulate nature's cycles and care for natural resources at home.



Field Trip Preparation, Reminders & Post-Visit Activities

IN-CLASS PREPARATION

Before Your Visit

The following activities may help your class prepare for their visit to the Hawai'i Nature Center:

- Introduce (or review) cycles in nature. The following activities (copied with permission from the *'Ōhi'a Project Grades K-3 Guidebook*) are recommended:

The Water Express (water cycling between soil and plants)

The Airy Go Round (the gas cycle)

Waterfall Wizards ('o'opu life cycles)

Sprouting, Flowering and Fruiting (plant life cycles)

- Review the food web of the compost pile (see enclosed information sheet).

ON THE DAY OF THE FIELD TRIP

Important reminders for the day

- Prior to your visit, you will receive a phone call from the Environmental Educator coordinating your field trip to confirm the number of students, arrival and departure times, and other details, including a "rainy day" plan. If weather conditions are questionable, you will receive a call the morning of your field trip to discuss alternative options. If you do not receive a call the morning of your field trip, your field trip is good to go.
- Divide students into equal subgroups of 20 students before leaving school. Classes of 40 or fewer students need only two subgroups. Classes with fewer than 20 students need not divide.
- Bring two adults (teachers/parents) for every subgroups of students. Aids for special needs students are encouraged to come and are not considered group chaperones. They may come free of charge.
- EVERYONE, including teachers and parents, needs name tags.
- Apply mosquito repellent before you arrive - please do not apply to face or hands (long sleeved shirts and long pants are the best protection).
- Have students wear old clothes and sneakers that can get dirty. (Rain gear is optional, HNC has ponchos for the children to use.)
- Bring large garbage bags to take lunch litter back to school. However, we encourage ZERO WASTE (i.e., reusable lunch bags, reusable food containers, and reusable water bottles).

EXTENDED ACTIVITIES

After Your Visit

Before the excitement cools and the memories begin to fade, try some of these activities:

- Learn the Hawai'i Nature Center's "Cycle Song", included at the end of this packet. It addresses the cycles presented during the field trip, and can be sung in 3 rounds, or cycles.
- Produce a cycle board illustrating the different natural cycles presented at the Hawai'i Nature Center.
- Complete the 'o'opu craft suggested in *Waterfall Wizards*, and use the models on a stream mural. Add pebbles, twigs, and mosses to give depth and texture.
- Build an aquarium and/or terrarium in your class. Have students take responsibility for caring for the plants and animals.



- Go on a seed search! Examine the seeds with a magnifier and try to find the plants they came from.
- Create a compost pile at school. See *Get the Most Out of Compost*, included. Alternatively, see how quickly (or slowly) items decompose under water, or buried deep in the soil!
- Decide as a class to recycle at least one type of material you regularly use.
- Learn more about small animals on the school grounds. Excellent resources on stink bugs, flies, praying mantis, roaches, sowbugs, earthworms and spiderlings, reprinted with permission from *Hawai'i Nature Study's* volumes on Insects and Small Animals are included.



Background Information for Teachers

(Note: This information is provided to help you answer those difficult questions. Most of it is not age appropriate for Second Graders.)

The Water Cycle

More than two thirds of the Earth is covered by water. However, less than three percent of the total is freshwater, and most of that is stored in ice caps and glaciers! Less than one percent of the water on Earth is found in streams and lakes and underground reservoirs. Fresh water is a very precious commodity.

All of the fresh water found in the Hawaiian Islands is derived from moisture held in the air as water vapor. Energy from the sun evaporates water (from the ocean, streams, cane fields, forests, and puddles) and holds it in the air as water vapor. As the tradewinds push the air up and over the mountains, the water vapor cools, and some of it condenses into clouds and rain. Water droplets from drifting clouds and fog catch on rocks and trees and add their moisture to the land. As a result, rainfall in the islands is highest on windward slopes. Leeward areas receive rain only sporadically, usually during Kona storms.

Some of the moisture from rain, clouds, and fog is drawn in by plants through their roots to transport nutrients and help keep them upright. It is eventually released, or transpired, through the plant walls (primarily through stomata on the underside of leaves). Plants need much more water than animals do, since water travels through plants only once, while it cycles around and around in animals. A full grown tree might use as much as 200 gallons of water per day!

Once water drains deeper than the deepest root reaches, it can no longer be used by plants. Some will seep out into streams and rivers. Some will become perched atop sheets of dense, impermeable rock. The rest will drain into a freshwater lens within the island. Because fresh water is slightly less dense than salt water, the fresh water lens floats atop the sea water that saturates our islands below sea level.

Most of the freshwater lens is in fact below sea level! For every foot of fresh water above sea level, about 40 feet are below, floating gently on the denser salt water. Water in the lens continually seeps out the sides of the islands...swimmers may feel the cooler water near shore. Fresh water is also pumped up for human use.

Of course, not all water is used by plants or recharges the groundwater lens. When rain falls faster than the soil can absorb, it runs off into gullies and streams and flows out to sea. This is what happens to most of the rain that falls during storms and extended rainy periods. Streams are also fed from water seeping in from higher elevations, and from perched water that flows horizontally into stream cuts. At lower elevations, streams may be fed from groundwater sources.

Regardless of where the water goes - into streams, out to sea, or to be used by plants - it will eventually be picked up by the sun again, and return to the air as water vapor. The water cycle operates day and night, continually cleaning and replenishing the Earth's water supply.

Stream Life at Makiki Valley

There is ample archeological evidence that people have been living in Makiki Valley for centuries. Stream water was captured for domestic use as well as for agriculture. The stream continued to flow out to Waikiki, where marshes, taro *lo'i* and duck ponds flourished.

For a time, much of the fresh water that came from springs in the back of the Makiki Valley was captured by the Board of Water supply for domestic use. The excess water eventually made its way to the Ala Wai Canal and flowed out to sea, as it does today. Daily stream flow, occasional storm flows, channelization downstream, and urban pollution have created a less-than-ideal environment for Hawaiian streamlife. To understand the effect low stream flow has on native freshwater organisms, we need to understand their life cycles.



Native Hawaiian stream animals typical of healthy streams include gobies (*'o'opu*), shrimp (*'ōpae*), snails (*hīhīwai*), dragonflies (*pinao*) and damselflies (*pinao 'ula*). The *'o'opu*, *'ōpae*, and *hīhīwai* all have diadromous life cycles. That is, they spend part of their lives in the ocean, and part of their lives in a stream. Mature adults live in streams, where females eventually lay eggs. As the eggs hatch, they are carried out to sea by the force of the stream. The fry spend their childhood in the ocean, and then return to a stream as young adults, where they complete their life cycles. If access between the stream and the ocean is cut off (due to low stream flow, for example), the cycle is broken, and they cannot reproduce. Because Makiki Stream is so heavily channelized downstream, and so much water is diverted before it reaches the sea, we seldom see *'o'opu*, *'ōpae*, or *hīhīwai* in the wild around the Hawai'i Nature Center.

Fortunately, dragonflies and damselflies do not have diadromous life cycles. Most species deposit their eggs in fresh water. Naiads (a name for aquatic larvae) hatch from the eggs. After a series of molts and a great deal of food, they metamorphose into adults. Students are unlikely to see naiads in the Makiki streams, since it's a little too strong and fast for them, but they may see the adults, who lay eggs in the slower, smaller feeder streams.

The animals students are most likely to find during their investigations are introduced shrimp, tadpoles, swordtails, guppies, and Tahitian prawns. The tadpoles we are likely to encounter will grow up to be wrinkled frogs, which were originally brought to Hawai'i from Japan in 1896 for insect control. The tadpoles have pale bellies (which blend with the sky when seen from below) and are dark brown on top, just like the rocks in the stream. The adult frogs are good leapers, and can hide underwater for several minutes. Swordtails, which originated in Mexico, can be distinguished by long "swords" protruding from rear of the males. They are typically silvery blue or green, although other colors of swordtails do exist. Guppies are popular aquarium fish which were released into the wild and are now found in the lower reaches of streams throughout Hawai'i. They are carnivorous, feeding on insect larvae and even their own young. Tahitian prawns were introduced to two streams in Hawai'i in the 1950s as part of an effort in aquaculture. Like the native gobies and shrimp, they have diadromous life cycles, and quickly spread to all free-flowing streams in Hawai'i. They are larger than native prawns or shrimp, and as omnivorous scavengers, they compete with the native organisms for food and habitat.

The Nutrient Cycle

All living things need an assortment of nutrients to survive. These range from the carbohydrate combinations of sugars and starches, to trace elements such as iodine and magnesium. Many nutrients are in limited supply or lie on the bottom of oceans. Fortunately, nature responds by recycling locally.

Through photosynthesis, plants make their own food. Many plants rely on symbiotic microbes to fix nitrogen, the most important nutrient for plant growth. Other nutrients are harder to come by. Nutrients stored in once-living matter must be broken down by decomposers before plants can draw them up through their root systems.

Bacteria are generally the first organisms to begin the process of decomposition. They may begin to attack an old tree at the cellular level even before it falls. This breakdown of matter allows other decomposers to enter the picture and continue the process.

Fungi are also early stage decomposers. Fungi, as well as bacteria, need warmth and moisture to thrive. The fungi we sometimes see protruding from fallen logs are connected to fungal "roots" which lie deep inside the log, decomposing it from the inside out. The colorful piece outside is the fruiting body, the part that produces spores and can reproduce.

Fungi and bacteria both require warm, moist conditions to survive. This is why soggy socks under the bed are quickly covered with fungal "fur", while orange peels tossed off the trail at chilly Haleakalā may stay intact for weeks!



After sufficient decomposition by bacteria and fungi, invertebrates begin their role in the forest clean up. Invertebrates comprise by far the greatest abundance of animal life in Makiki Valley. They include pill bugs, worms, ants, ear wigs, springtails, leaf hoppers, nematodes, flat worms, roaches, millipedes and spiders.

Throughout time, nutrients have been recycled through the process of growth, death, decomposition, and new growth. We have much to learn by copying these natural processes. Here in Hawai'i, treated waste water is sometimes applied to cane fields after the harmful bacteria are destroyed in the processing of the cane. Treated human sewage can also be used on plants that people do not eat, such as lawns for golf courses and parks. In our own backyards, composting kitchen scraps and garden wastes is a simple and inexpensive way to recycle nutrients back into the soil. By copying nature's example, we can protect our soil resources, avoid using costly petroleum-based fertilizers, and put wastes that might otherwise pollute our land and water to good use.

The Plant Life Cycle

Plants undergo their own cycles of birth, growth, maturity, and death. Unlike animals, plants continue to grow throughout their lives. Non-flowering plants (which include blue-green algae, mosses, liverworts, ferns, and gymnosperms, or pines) have relatively primitive reproductive systems. In the HNC Grade 2 program, we focus on flowering plants.

In all flowering plants, the organ for sexual reproduction is the flower itself. The flower can be viewed in four separate parts. The outermost parts, which are usually green and leaf-like, are the sepals. Next are the petals, which are often brightly colored and attract insects or birds. Within the petals are the stamens. At the top of each stamen is an anther, which releases pollen grains.

The innermost part of the flower is the carpel. At the top of the carpel is the stigma (the sticky surface specialized to collect pollen). It is connected by a slender style to the ovary at the base of the flower. When pollen is brushed by a foraging bird or insect onto the stigma, it is carried to the ovules (eggs) in the ovary.

Once fertilized, the ovule develops into a seed. The petals and stamens fall away, and the wall of the ovary develops into the fruit. Some plants, such as avocado, produce only one seed per fruit. Others, such as guava, produce many seeds. Still others produce fruit and seeds so tiny we can barely see them!

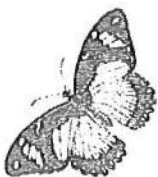
When the seed matures, the embryo becomes dormant. The seed wall thickens and hardens, and the seed (in the fruit) drops from the plant. Seeds must remain dormant for a while before they will germinate (sprout). Seeds of some species can remain dormant for hundreds of years before germinating.

The seed coat plays a major role in maintaining dormancy in a plant. As long as the seed coat is intact, water and light cannot reach the seed and promote growth. Some seeds' coats disintegrate readily under normal rain and wind conditions. Others must be burned away by fire. Still others must pass through a bird's gullet before they will weaken!

The first part of the plant to break through the seed is the root. The root anchors the seed to the ground, and begins drawing in water and nutrients. Next, a tiny sprout will reach up towards the light. If it continues to receive enough light and water, and isn't stepped on, eaten, or washed away, the sprout may survive and grow into a seedling, a sapling, and finally a full grown tree. When the tree (or other plant) reaches sexual maturity, it will begin producing flowers of its own, and the cycle will continue.

The Gas Cycle

Carbon and oxygen also travel through natural cycles. While most carbon is stored in rock deep within the Earth, some is found in plant matter on the surface of the Earth, or as a gas combined with oxygen.



Oxygen, while critical to our survival, comprises only a small part of the elements present on Earth. It did not exist as a free gas (not combined with something else) until evolutionary processes on the planet had led to the emergence of plant life. Without the photosynthetic processes of plants, modern animals would not have evolved. Today, only very primitive types of organisms, such as some fungi and yeasts, can survive without oxygen.

Plants take in carbon dioxide through their stomata, tiny oval openings on the underside of leaves. This combines with hydrogen (a component of water) and, fueled by light, is converted into a simple sugar that the plant uses to grow. The oxygen left over in the conversion process is released back into the air through the stomata. Because plants are the primary source of free oxygen in the atmosphere, they are very important to animal survival.

Animals draw in oxygen in a variety of different ways. Some pull it into lungs, others through gills, still others (such as earthworms) through membranes on the surfaces of their bodies. The oxygen is circulated through the body in the blood stream. It enters individual cells through the cell wall. Carbon dioxide is picked up by the blood stream, and released (in many animals) into the lungs, and then back in the air.

Because carbon dioxide is produced naturally through volcanoes and other sources, plants do not need animals to survive. Animals, on the other hand, could not survive without the help of plants, and the important role they serve in the gas cycle.

***More background information on the
Next Generation Science Standards (NGSS) to be added soon!**

Below are the NGSS for Second Grade Life Sciences and Earth Systems that are emphasized in HNC's Cycles in Nature program. HNC is currently in the process of compiling additional background information as well as pre/post activities that are aligned with the new standards. Thank you for your patience with this!

Science Practices:

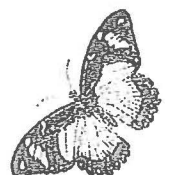
1 - Asking Questions. Ask questions based on observations to find more information about the natural and/or designed world(s).

3 – Planning and Carrying Out Investigations. Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. Make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons.

4 - Analyzing and Interpreting Data. Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions.

6 - Constructing Explanations and Designing Solutions. Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. Generate and/or compare multiple solutions to a problem.

8 - Obtaining, Evaluating, and Communicating Information. Builds on prior experiences and uses observations and texts to communicate new information. Read grade-appropriate texts and use media to obtain scientific information to determine patterns in the natural world.



Disciplinary Core Ideas:**LS2.A: Interdependent Relationships in Ecosystems.**

- * Plants depend on water and light to grow (2-LS2-1).
- * Plants depend on animals for pollination or to move their seeds around. (2-LS2-2)

LS4.D: Biodiversity and Humans.

- * There are many different kinds of living things in any area, and they exist in different places on land and in water. (2-LS4-1)

ESS2-C: The Roles of Water in Earth's Surface Processes

- * Water is found in the ocean, rivers, lakes, and ponds. Water exists as a solid ice and in liquid form (2-ESS2-3)

Crosscutting Concepts:**Cause and Effect.**

- * Events have causes that generate observable patterns. (2-LS2-1)

Structure and Function.

- * The shape and stability of structures of natural and designed objects are related to their functions). (2-LS2-2)

Patterns.

- * Patterns in the natural world can be observed, used to describe phenomena, and used as evidence. (2-ESS2-2), (2-ESS2-3)

Safety Concerns

While the stream is an exciting place to explore and discover, it does have its hazards. The most common concern is that children will become too rambunctious on the wet rocks and slip and hurt themselves. Our teaching staff will review the rules for stream conduct before we go out. If a child fails to heed safety concerns, s/he will be asked to remain on the bank.

Rapidly moving water presents another risk (although Makiki Stream has few flash floods). Staff are alert to the danger, and regularly monitor the stream. We will cancel the program or move this activity to another location if we judge the stream to be unsafe.

Leptospirosis is a less visible, but potentially serious threat. It is a spirochete carried in the wastes of mammals, including rats, mongooses, and pigs. People can contract the virus through open wounds, eyes, nose, and mouth. Early symptoms are flu-like, but the illness can be fatal if left untreated. Children will be asked to inspect their hands for cuts before venturing into the stream. No one, under any circumstances, should drink the water.

Leptospirosis is a small risk when the stream is moving quickly...it is more of a danger when the water is shallow, warm, and stagnant. Muddy soil near the stream can also harbor the virus. A strong rain after a dry spell can flush leptospirosis into streams. It is very important that children do not put their fingers in their mouths, noses, or eyes, and that they wash their hands well before lunch.

Perhaps the most ferocious of the forest animals are centipedes. They tend to live under rocks or logs. They won't bite unless they are threatened or alarmed. In nutrient cycle investigations, children sometimes find baby centipedes. We will place the first one found in a bug box for all to inspect, and ask that any other centipedes discovered be left alone. This is a very difficult rule for excited children to follow. It might help if you warn them ahead of time that centipede bites can be very painful, and that collecting centipedes is off limits.



Another possible danger in the forest is the wind. It can appear still and calm on the forest floor, while in the canopy high above, limbs are flailing back and forth. Old or diseased trees can fall with little or no warning to those below. Programs will be canceled on very windy days.

Our staff and volunteers are well trained and are prepared to handle most emergencies, with your help. First aid kits and phones are always close at hand. No one on a Hawai'i Nature Center program has been hit by a falling tree, carried away by a flash flood, or contracted leptospirosis. Safety is always our first concern and the information presented here is included to make you aware of the dangers, and help us create a safe, successful program for your class. Please call our office if you have any additional concerns or suggestions.



Todd A. Cullison
2131 Makiki Heights Dr. Honolulu, HI 96822

Experience

- August 1, 2019 – Present Hawai'i Nature Center Honolulu, HI
Executive Director
Strategic vision and implementation of mission and new programs
Staff management
Principal grant writer/fundraiser
Board of Director's liaison
Overall project management
- June 1, 2016 – Present University of Hawai'i Foundation Honolulu, HI
Associate Director of Development, UH Cancer Center
Identify, engage and solicit prospective donors for major and leadership gifts (>\$5million raised)
Strategic planning for capital campaign; manage 75-100 major gift prospects
Liaise with University of Hawai'i Foundation and Cancer Center leadership on priority philanthropic needs
Partnership collaboration across University units and community partners
- Dec. 2006 – May 2016 Hui o Ko'olaupoko (HOK) Kailua, HI
Executive Director
Oversaw transition of Kailua Bay Advisory Council to a 501(c) (3) non-profit
Developed strategic business plan for non-profit
Developed and tracked annual and project budgets
Provided overall project management including budget tracking, funder coordination, technical review, sub-contractor awards and on-the-ground restoration project management
Created volunteer program: >13,000 volunteers contributed >35,000 hours (2010-16)
Oversaw donor relations including individual, corporate and annual fundraiser
Principal grant writer, secured >\$3 million in total grant funding, >70% grant award rate
Recruited, hired and supervised staff including community coordinator, project and grants manager
Principal Investigator: *Ko'olaupoko Urban Sub-basin Action Plan* and *Hawai'i Residential Rain Garden Manual*
Principal Investigator: *Waimānalo Watershed Water Quality Investigation*
Liaise with government, private entities, landowners and community stakeholders
- July 2006 – Dec. 2006 Kailua Bay Advisory Council Kailua, HI
Watershed Restoration Action Strategy Coordinator
Principal Investigator: *Ko'olaupoko, Watershed Restoration Action Strategy*
Supervised staff including project manager and GIS researchers
Prioritized, planned and coordinated watershed restoration and monitoring efforts
- Jan. 2001 – June 2006 CREST (Columbia River Estuary Study Taskforce) Astoria, OR
Director of Watershed Programs
Coordinated watershed restoration and monitoring for five community-based watershed councils
Provided on-site construction management for fresh water and estuarine restoration projects
Managed field staff including fisheries biologist and riparian restoration coordinator
Coordination and delivery of in-class environmental education and field work
Coordinated with federal, state and local permitting agencies
Generated and tracked project budgets for watershed restoration and monitoring
Facilitated >300 community meetings
Conducted education and outreach to state and local elected officials and municipalities
Secured > \$1.3-million dollars in grant funds for restoration, monitoring and planning
- May 2000-Dec. 2000: Center for Environmental Education, Project Coordinator, Pullman, WA
May 1998-Dec. 2000: Groundworks Institute, Environmental Education Coordinator, Pullman, WA
May 1998-May 2000: Center for Environmental Education, Program Staff, Pullman, WA

Education

Washington State University, B.A. English (technical writing), Business Minor
Washington State University, course work toward Masters in Community Based Restoration
Continuing education: estuary ecology, watershed restoration prioritization models, donor engagement and fundraising

Chaylise K. Chang

875 Iao Valley Rd. Wailuku, HI 96793
(808) 244-6500

PROFESSIONAL EXPERIENCE

HAWAII NATURE CENTER, WAILUKU, HI

PROGRAM COORDINATOR, OCTOBER 2018 – PRESENT

- Develop and implement education programs and lessons
- Provide environment-based, hands-on field trips, tours, intersession camps, & demonstrations
- Scheduling
- Training & managing staff
- Attend community outreach events
- Fund development
- Facility maintenance

BIG BROTHERS BIG SISTERS OF MAUI, WAILUKU, HI

PROGRAM COORDINATOR, JULY 2017 – OCTOBER 2018

- RUN AND MANAGE AN AFTER-SCHOOL PROGRAM FOR DISADVANTAGED YOUTH
- CREATE AND WRITE LESSON PLANS
- SCHEDULE APPOINTMENTS WITH COMMUNITY PARTNERS AND ATTEND COMMUNITY MEETINGS
- TRAIN PROGRAM ASSISTANT AND VOLUNTEERS
- ORGANIZE FILES/PAPERWORK FOR GRANT REPORTS

HAWAII NATURE CENTER, WAILUKU, HI

ENVIRONMENTAL EDUCATOR, MAY 2011 – FEBRUARY 2015

- Taught students about Hawaii's unique ecosystems, plant & animal species, geographical history, and modern conservation efforts
- Helped develop and implement education programs and lessons
- Provided environment-based, hands-on field trips, tours, summer camps, & demonstrations
- Attended community outreach events

KAMEHAMEHA SCHOOLS, HONOLULU, HI

ENRICHMENT LEADER, SUMMERS OF 2007-2010

- TAUGHT CHILDREN, AGES 10-15, ABOUT HAWAIIAN CULTURE, LANGUAGE, HISTORY, AND ARTS
- SUPERVISED CHILDREN IN DORMITORIES AND ON FIELD TRIPS
- HELPED CHILDREN DEVELOP COMMUNICATION, INTERPERSONAL, AND WORK ETHIC SKILLS

EDUCATION

UNIVERSITY OF HAWAII AT MANOA, HONOLULU, HI

Elementary Education

University of Hawaii Maui College, Kahului, HI

Liberal Arts

Kamehameha Schools, Honolulu, HI

High School

Taylor Fujimoto

tfuj@hawaiinaturecenter.org

Education:

University of San Francisco – USF

San Francisco, California
Bachelor of Arts Degree - Environmental Studies Major

Aug 2006 - Dec 2013

Related Experience:

Hawai'i Nature Center (NPO), Education Program Manager

- Lead DOE field trips with a focus on Hawai'i's natural history and environmental science for grades K-8
- Work with interdisciplinary team to develop curriculum
- Schedule, manage, and train new environmental educator

Nov 2014 – Present

Surfrider Spirit Sessions (NPO), Program Coordinator

- Directed programs with Hawaiian and environmental lesson plans for at-risk youth
- Assisted in grant management, writing, and research for local, state and government funding opportunities
- Coached teenage interns to help develop life and career skills
- Contributed in ongoing fundraising efforts including an annual golf tournament

*Mar 2013 – March
2019*

Iolani School Summer Programs, Surf Instructor

- Wrote and taught curriculum on the history and cultural significance of surfing in Hawaii
- Instructed students on marine safety while teaching basic principles of surfing
- Provided hands on assistance while students were in the ocean

*June 2013 – July
2015*

Nu'uanu Elementary, After School Program Instructor

- Tutored 2nd and 3rd graders in English, Math, and Science
- Organized indoor and outdoor activities for students
- Corresponded with parents regarding student requirements

*Nov 2012 - Dec
2013*

Jean Parker Elementary, After School Program Director

- Tutored 3rd and 4th graders in Math and English
- Developed and implemented lesson plans in Gardening, Drama, and Journalism
- Led and instructed student field trips for after school collaborations

*Sept 2010 – June
2011*

Additional Experience:

Kona Kai Sushi, Manager

- Provided optimal dining experience for restaurant guests
- Scheduled and trained staff

*March 2017 – Dec
2019*

University of San Francisco, Event Scheduling Assistant

- Assisted clients with planning and preparation for on-campus meetings and events
- Coordinated and assisted with set up of events, including audio-visual equipment

*Sept 2007 - Feb
2010*

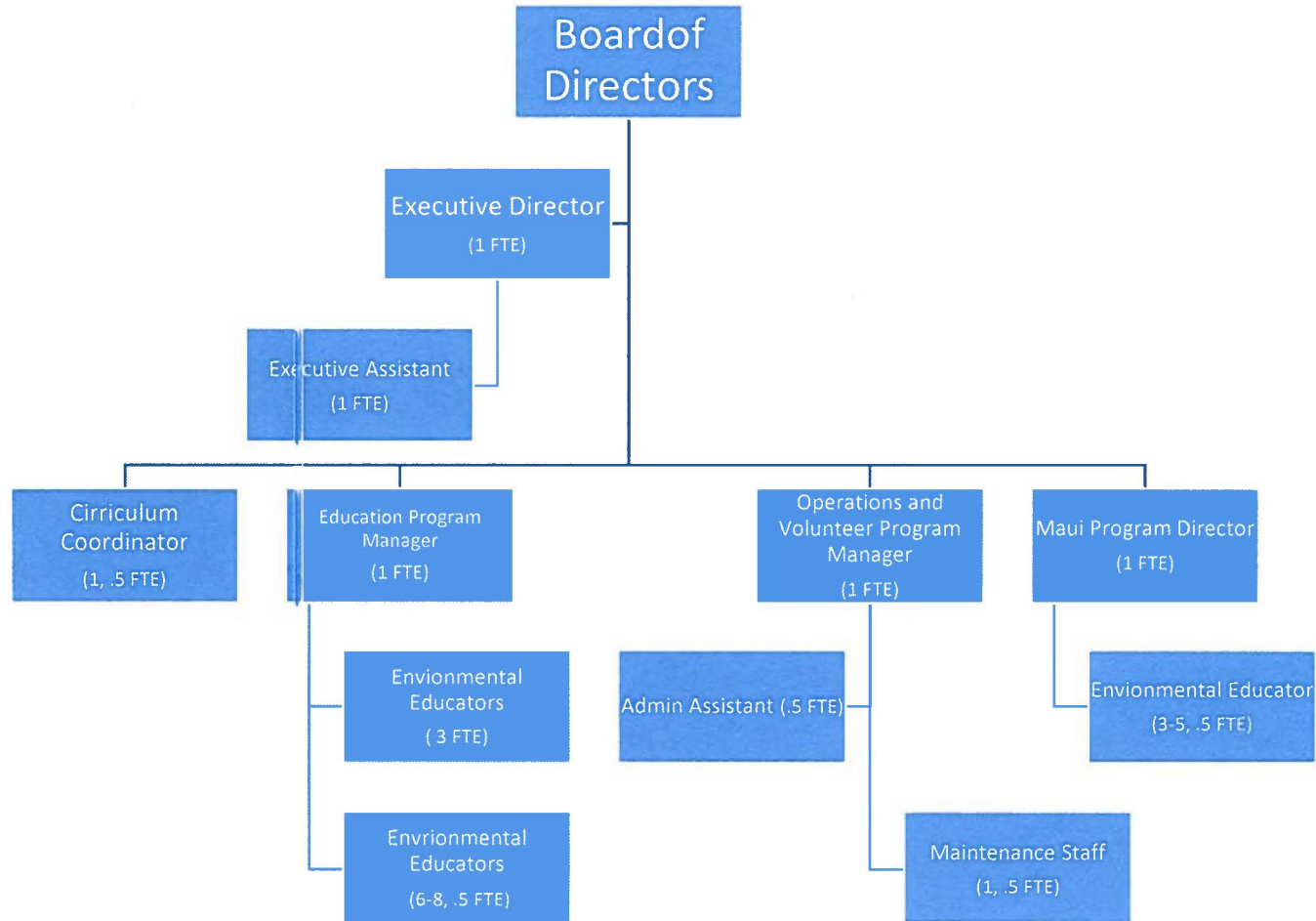
Volunteer Experience:

KTUH Radio Station, Disc Jockey

- Host the rock music segment every Friday from noon to three p.m.
- Announce on-air community and campus calendars

Aug 2012 - Present

Hawaii Nature Center: Thirtieth Legislature GIA: Appendix E



BUDGET JUSTIFICATION - PERSONNEL SALARIES AND WAGES

Period: July 1, 2020 to June 30, 2021

Applicant: Hawaii Nature Center

POSITION TITLE	FULL TIME EQUIVALENT	ANNUAL SALARY A	% OF TIME ALLOCATED TO GRANT REQUEST B	TOTAL STATE FUNDS REQUESTED (A x B)
Executive Director	1	\$90,000.00	10.00%	\$ 9,000.00
Mauui Program Coordinator	1	\$45,000.00	25.00%	\$ 11,250.00
Education Program Coordinator	1	\$42,000.00	25.00%	\$ 10,500.00
Envrionmental Educator	1	\$30,000.00	30.00%	\$ 9,000.00
Envrionmental Educator	1	\$30,000.00	30.00%	\$ 9,000.00
Envrionmental Educator	1	\$30,000.00	30.00%	\$ 9,000.00
Envrionmental Educator	1	\$30,000.00	30.00%	\$ 9,000.00
Envrionmental Educator	1	\$30,000.00	30.00%	\$ 9,000.00
Envrionmental Educator	0	\$30,000.00	30.00%	\$ 9,000.00
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
				\$ -
TOTAL:				84,750.00
JUSTIFICATION/COMMENTS:				

BUDGET JUSTIFICATION - EQUIPMENT AND MOTOR VEHICLES

Period: July 1, 2020 to June 30, 2021

Applicant: Hawaii Nature Center

DESCRIPTION EQUIPMENT	NO. OF ITEMS	COST PER ITEM	TOTAL COST	TOTAL BUDGETED
NOT APPLICABLE			\$ -	
			\$ -	
			\$ -	
			\$ -	
			\$ -	
TOTAL:				
JUSTIFICATION/COMMENTS:				

DESCRIPTION OF MOTOR VEHICLE	NO. OF VEHICLES	COST PER VEHICLE	TOTAL COST	TOTAL BUDGETED
			\$ -	
			\$ -	
			\$ -	
			\$ -	
			\$ -	
TOTAL:				
JUSTIFICATION/COMMENTS:				

BUDGET JUSTIFICATION - CAPITAL PROJECT DETAILS

Period: July 1, 2020 to June 30, 2021

Applicant: Hawaii Nature Center

FUNDING AMOUNT REQUESTED						
TOTAL PROJECT COST	ALL SOURCES OF FUNDS RECEIVED IN PRIOR YEARS		STATE FUNDS REQUESTED	OF FUNDS REQUESTED	FUNDING REQUIRED IN SUCCEEDING YEARS	
	FY: 2018-2019	FY: 2019-2020	FY:2020-2021	FY:2020-2021	FY:2021-2022	FY:2022-2023
PLANS	NA					
LAND ACQUISITION	NA					
DESIGN	NA					
CONSTRUCTION	NA					
EQUIPMENT	NA					
TOTAL:						
JUSTIFICATION/COMMENTS:						