



CITIZEN SCIENCE
for Conservation in Southern California
SYMPOSIUM

PRESENTATION
ABSTRACTS

The 2018 Citizen Science Symposium was made possible
by support from the following sponsors:



100 Aquarium Way, Long Beach, CA 90802
(562) 590-3100 • www.aquariumofpacific.org



Saturday, March 24th, 2018

Lightning Round Presentations

10:30 a.m. — 12:00 p.m. in the *Ocean Theater*

Lightning Round Presentation Abstracts are on pages 1 - 5

Special Session Presentations

3:00 p.m. — 3:45 p.m. in the *Ocean Theater*

Special Session Presentation Abstracts are on page 6

Poster Presentations

4:00 p.m. — 6:00 p.m. at the Reception on the *Veranda*

Poster Presentation Abstracts are on pages 7 - 9

Harmful Algal Blooms: Phytoplankton Monitoring Comparison of Two Locations in the Southern California Bight

by Gavin Peters and Jenny Peters;
Aquarium of the Pacific, HABwatch, CDPH Marine Biotxin Monitoring

This project was designed to discover the quantitative contributions of nutrient loading on marine phytoplankton. Through weekly water analysis from two locations, Redondo Beach's King Harbor and Long Beach's Rainbow Harbor near the fresh water outlet of the Los Angeles River, the main purpose of the experiment was to assign relative abundance percentages to observed phytoplankton cells. The hypothesis was that nutrients from the fresh water outlet of the LA River would create a greater prevalence of phytoplankton compared to a similar harbor without the input of these nutrients.

The California Department of Public Health (CDPH) Marine Biotxin Monitoring Program supplies volunteers with a 20 μ m mesh phytoplankton net, 200 mL cod end for collection, identification field guides, data spread sheet, and microscope observation protocols. Using a OMAX digital compound LED microscope, three microscope slide plankton samples were averaged to obtain an accurate representation of relative abundance for each organism observed. The tallied data and water sample were sent to Richmond, California for verification by CDPH Environmental Management Branch experts. The samples were compared once a week from November to January and relative abundances were compared between locations.

Results were achieved by combining relative abundance percentages of Long Beach and comparing those to the combined percentages of Redondo Beach. The data showed phytoplankton accumulation.

The hypothesis that nutrient loading along fresh water outlets increases phytoplankton abundance was strongly supported by the results.

An Overview of the Findings of the North American Freshwater Turtle Research Group's Citizen Science Program

by Michael Skibsted; *Bio Time, Inc.*

For the past year I have been working with the North American Freshwater Turtle Research Group, a citizen science based program, in New Braunfels Texas. The project is a mark and recapture study that is ongoing. Volunteers (citizen scientists) participate in snorkeling for turtles and then process them, which includes PIT tagging and shell notching the turtles. The overall objective of the study is to learn as much as we can about the turtles inhabiting Comal Springs, the local spring system. Periodically, university students will attend samplings to focus on a specific aspect of the study that they will use for one of their projects. There are four samplings in each year in New Braunfels, each having somewhere around 30 volunteers attending. This poster provides statistics and data specifically focused on the turtles.

Short, Cheap...But Sweet!

Informing Local Governments Regarding Wildlife Activity in a Recreational Area Through Inexpensive and Noninvasive Trail Camera Methodology

By Korinna Domingo; *Mountain Lion Foundation* and *Humboldt State University*

Local governments value information about wildlife presence in order to reassure and inform residents about how best to coexist in recreation areas and along the urban edge, to inform land-use planning, and to conserve ecosystems. But most cities cannot afford peer-reviewed studies to document wildlife. This survey identified species of mammals that live in the Verdugo Mountains in Burbank, California using inexpensive, noninvasive techniques in collaboration with citizen scientists.

Little was known about the activity of mammals likely to interact with recreating humans relative to time of day along the primary trail system. Remote sensing cameras were deployed to compare results on fire roads, hiking trails, game trails and in areas without apparent trails.

A total of 162 photos were captured using motion-activated infrared cameras between January and June 2017. Of these, 33% were coyote, 17% bobcat, 14% gray fox, 12% striped skunk, 10% mule deer, 8% opossum, 5% mountain lion, and 1% other.

Citizen Science with the Golden Gate MPA Collaborative and Preliminary Monitoring Results of the Marine Protected Areas of the North Central MPAs

by David McGuire; *MPA Collaborative* and *Shark Stewards*

In 2017 and early 2018 the Golden Gate MPA Collaborative and NGO Shark Stewards partnered with the company Open Explorer, to perform preliminary survey work as a tool to record species and habitat within MPAs using a prototype Trident ROV. This small, camera equipped submersible proved useful in recording benthic observations at the Farallon Islands SMR and other locations, including areas of high surge, low visibility. This poster will highlight the findings from the videos and discuss the merits and challenges of using these underwater drones.

Catalina Marine Society Citizen Science Projects

by Karren Norris and Craig Gelpi; *Catalina Marine Society*

The Catalina Marine Society is chartered to advance scientific knowledge of the local ocean. We design projects for which SCUBA divers and boaters can use their expertise to deploy sensors that automatically record important ocean data. Other volunteers organize and analyze the measurements. The Society has made considerable contributions to the understanding of the Southern California Bight using ocean temperature measurements gathered by citizen scientists coupled with data obtained from universities and government laboratories. Projects include determining a relationship between El Nino and urchin populations, measuring the vertical eddy diffusion coefficient, and chlorophyll dynamics in the Southern California Bight.

Data Analysis: Exploring Individual Citizen Science Monitoring Data

by Barbara Ramon¹, Celeste Hassler¹, Zaida Ortez¹, and Cassandra Davis, M.Sc.^{1,2}; *Southern California Sea Turtle Monitoring Project (SCSTMP)*¹ & *Aquarium of the Pacific (AOP)*²

Citizen science observation is an increasingly important tool for wildlife monitoring and management. Analysis of observational data traditionally examines sightings, observations, and recordings from groups, locations, time periods, or stations. Data quality analysis may examine group performance, specific case studies, or training methods. Citizen science projects offer another unique data point: Individual contributions.

Examining individual observations, total observations, and relationships between observations, training, experience, and site location for the citizen scientists in the Southern California Sea Turtle Monitoring Project revealed unique insights into data quality and observation probability. It also revealed an ongoing opportunity to engage citizen scientist volunteers and communicate a personal connection to the data for individuals.

This study explores the findings of an in-depth analysis of individual contributions to monthly citizen science wildlife observations over the course of six years, and explores the potential for ongoing volunteer engagement through personalized data reports.

Citizen Science in the Classroom Using Photo Identification

by Saki Hashimoto; *TRG Foundation*

The development of photo identification techniques as a valid means of studying some sea turtle species has accelerated in recent years. We have found this technique to be useful in the lower San Gabriel River in Long Beach, California, where we can observe and photograph surfacing green sea turtles in the area. Our next steps involve development of an organized photo collection program that can be incorporated into existing citizen science monitoring efforts, as well as participation from the public anytime photos can be collected. Additionally, increasing awareness and accessibility of citizen science programs are much needed in public school settings. Providing professional development opportunities about citizen science can allow teachers and educators to gain tools to easily incorporate programs into their curriculum.

Leveraging Citizen Science as an Outreach and Education Tool

by Erika Delemarre, *MAS-MBC Candidate at the Scripps Institution of Oceanography, UCSD*

Marine plastic pollution has become a global problem which impacts the health of marine ecosystems worldwide. Plastics can entangle or be ingested by marine animals at all trophic levels, threatening their wellbeing and potentially impacting economically important fisheries and human health. Five Gyres is harnessing the power of citizen science to collect data on marine debris through their TrawlShare program. The data collected will contribute to the organization's research and efforts to educate the public and inform international policy change. I am currently designing an experiential education curriculum to enhance the learning experience of the TrawlShare program for students aboard sailing training vessels. The program will be designed to increase understanding of the issue while inspiring young people to initiate change within their communities.

eLearning Tools—“Hubs” Between Volunteers, Educators, Classrooms, & Events

by Barbara Lloyd; *Ocean Sanctuaries*

One of the challenges of leading a citizen science effort is that volunteers bring with them a wide range of knowledge and experience. Volunteers may live in an area that lacks hands-on field opportunities or may simply be new to the practice of science. Training volunteers is important for the development, motivation, and retention of volunteers as well as ensuring the quality and consistency of data collection.

Ocean Sanctuaries wants to bridge the gap between the newly initiated, remote classrooms, hands-on training, and live citizen science events. Although we use social media regularly to generate interest and participation, we believe that an eLearning platform can provide a strong foundation in the What, Why and How of Citizen Science, for our current and future volunteers. To that end, we developed an eLearning tool to introduce people without a background in science how to participate in scientific investigation and, eventually, design and conduct their own investigations. The tool was designed as a foundation upon which both the burgeoning citizen scientist, as well as organizations, can develop, grow, and strengthen themselves and the movement.

In my 5 minute talk, I will suggest how eLearning tools can be used as a "hub" between new volunteers, continuing education, remote classrooms, and even live events including bioblitzes.

Friends with Fins — Educating the Next Generation of Ocean Stewards

by Jaclyn Friedlander and Timothy Riese; *Friends with Fins*

All it takes is a glimmer of inspiration or the seed of an idea to shape a child's future and create a citizen scientist. In a digital age where children spend hours in front of a screen, our goal is to bring ocean adventure to them and then encourage them to get out and participate!

San Diego Zoo's Wildlife Watch: Empowering Students to be Citizen Scientists

by Colleen Ferguson and Brooke Castro; *San Diego Zoo Global*

The San Diego Zoo has been providing educational programming to students in Southern California since 1955. Through interactive assemblies, engaging classroom programs, and hands-on outdoor field trips, the San Diego Zoo Education Department reached over 65,000 students last year. In an effort to increase scientific literacy and inspire environmental stewardship, outreach programming has been updated to include citizen-science based skill building and conservation action. One initiative, "Citizen Science: Wildlife Watch," was developed in 2016 as a two-part outreach experience that involves a zoo educator-led classroom program and a field trip to a local nature park. Students are given the opportunity to utilize real-world citizen science platforms, including Zooniverse and iNaturalist. Through this innovative program development, the Zoo has incorporated citizen science into additional programming in partnership with organizations, e.g., the National Park Service and U.S. Fish & Wildlife Services. Through these programs alone, the Zoo was able to engage over 400 students in citizen science last year, and expects to engage over 2,000 students in citizen science by June 2018.

2

South Bay Nature Meetup and iNaturalist Community

by Cheryl Bader and David Bader; *South Bay Nature Meetup*

If you are interested in our Coastal Environment this Meetup and iNaturalist Community is for you. Why? The Bolsa Chica Wetlands Ecological Reserve is an important part of our shrinking wetlands here in California. Every month we document the plants and animals that inhabit the wetlands. This monthly look has given us an overall view of migration patterns, a seasonal view of native plants, and has given us a chance to see the "rarities" that live in or visit the wetlands. Through the process of documentation and identification of the animals and plants of the wetlands, each participant has an opportunity to interact and benefit from the knowledge of the scientific community through the iNaturalist Community.

Our project: "Bolsa Chica Ecological Reserve 2017" on iNaturalist has made over 264 observations documenting 110 different species. Our observations have been helpful to other iNaturalist projects like the "California Rare, Threatened, and Endangers Species."

Using iNaturalist for Artificial Reef Monitoring

by Michael Bear; *Ocean Sanctuaries*

In 2000, the City of San Diego in collaboration with the San Diego Oceans Foundation (SDOF), purchased, cleaned and sank a 366 foot-long Canadian warship called the HMCS Yukon to create an artificial reef, a task at which has been spectacularly successful. Sitting at the bottom of the San Diego coast, the Yukon attracts dozens of local marine life species and is becoming a revenue-generating attraction for tourist divers from around the world.

When this project started, both the SDOF and the local scientific community were curious to understand the effects of an artificial reef on local fish populations and surrounding marine life. A joint study was undertaken by SDOF and Dr. Ed Parnell of Scripps Institution of Oceanography and released in 2004.¹ Crucial to the study was data gathered by local citizen science divers to generate a baseline of marine life species on the ship.

Ocean Sanctuaries, San Diego's first citizen science oriented, ocean non-profit is conducting a follow up study to the pioneering work of Dr. Parnell and colleagues using iNaturalist to log and identify marine species which have made the Yukon their home since 2004.

Onshore Sea Turtle Observation and Monitoring

by Cassandra Davis, M.Sc.¹⁻², Barbara Ramon², and Kelly Burkhead²; *AOP*¹ & *SCSTMP*²

Increased populations and urban development around coastal areas has led to increased opportunities for individuals to interact with sea turtles in and around major cities, developments, and recreational areas. It is increasingly important for local and regulatory agencies to understand populations and movement habits of these highly migratory species. Monitoring and identifying resident populations can inform habitat and land usage decisions, better inform recreational users of coastal areas (including divers, paddle boarders, boaters and fishermen), and provide population insights for regulatory agencies.

The discovery of a resident population of Eastern Pacific green sea turtles (*Chelonia mydas*) in Long Beach led to an exploration of shore-based population monitoring using citizen scientists, and the formation of the Southern California Sea Turtle Monitoring Program. The year over year citizen science observations of sea turtles in the San Gabriel River contribute to a greater understanding of the local population of *Chelonia mydas*, and provide insight into successful onshore monitoring of sea turtle populations.

7

Our Urban Watershed: Fostering Connections Through Exploration and Citizen Science

by Alexandria M. Warneke, M.S.; *Cabrillo National Monument*

In collaboration, Cabrillo National Monument and Ocean Discovery Institute developed a dynamic, hands-on science education program for students in the City Heights community. City Heights is a highly urbanized, densely populated, and ethnically diverse neighborhood in central San Diego. Our *Urban Watershed: Fostering Connections Through Exploration and Citizen Science* provides a unique opportunity to engage students in nature and scientific inquiry in meaningful ways across their local watershed both in their neighborhood and in their National Park. Utilizing a four-part guided and inquiry-based program with a classroom activities and field components, students explore watershed biodiversity and the challenges of living in the urban landscape. Using technological platforms provided by ESRI and the same techniques as park biologists, students participate in citizen science, long-term monitoring, and data analysis. The program is concluded with guided reflection and critical thinking regarding resource management and tools for action. The ultimate goal is that the *Our Urban Watershed* program sparks passion and excitement for science in the next generation of environmental leaders. Through this continuum of impacting experiences, we commit to the positive development of a healthy and enriched community – inspiring lifelong connections between students and their unique outdoor spaces.

Global FinPrint: A Collaboration with the Aquarium of the Pacific

by Erin McCombs, M.S.; *Aquarium of the Pacific*

Worldwide, 25% of shark species are threatened with extinction. To better understand this problem, Global FinPrint uses Baited Remote Underwater Videos or “BRUVs” to study shark distribution and population at 400 reefs around the world. A team of Citizen Scientists at the Aquarium of the Pacific is getting involved by viewing BRUVs in the Pacific Ocean and marking the appearance of sharks and rays before sending the information to scientists for further analysis. The information gained in this study will help inform policy decisions to protect reefs and shark populations, and identify shark hotspots that need protection.

Snapshot Cal Coast: 21 Century Natural History Along the California Coast

by Allison Young and Rebecca Johnson; *California Academy of Sciences*

Snapshot Cal Coast mobilizes and focuses community-based coastal stewards to address the need for open and accessible coast-wide biodiversity data. This citizen science program scales local, place-based species documentation efforts to occur simultaneously along the entire California Coast. We utilize the data collection platform iNaturalist and scaffold it with in-person bioblitz events, through close partnership the California Marine Protected Area Collaborative Network and other organizations who are dedicated to advancing marine education, research, and protection. Using this technology not only allows us to create a dataset that is instantly available to scientists and marine managers, but also democratizes this type of marine science, making it accessible for anyone to participate without the barrier of needing to be trained to identify species. 2018 will be the third year of Snapshot Cal Coast, building upon the more than 20,000 observations of 1634 species collected over the first two years.

6

Climate Change: Sea to Trees at Acadia National Park

by Aviva Intveld and Aaron Rovinsky; *Earthwatch Ignite*

Our team received a full merit scholarship through the Earthwatch Ignite program to stay at the Acadia National Park Schoodic Institute in Maine. Between talks from professionals at the institute on forestry and oceanography and interviews with local lobstermen to learn about the economic impact of climate change, we spent hours conducting field and lab research. In the field, this consisted primarily of sampling species in the intertidal zone to study the effects of ocean warming and acidification on biodiversity. We observed and documented the changing landscape of rock, seaweed, and various aquatic organisms using transects and quadrats. In the lab, we investigated the effect of invasive green crabs on the defensive behaviors of native periwinkles. In our free time, we assisted other research involving ascophyllum surveys and bird monitoring. This experience gave us a glimpse into the world of field research, an opportunity most students don't have until later in their lives, allowing us to do hands-on research in a professional setting. The emphasis on citizen science helped us realize how accessible research can be and how simple it is to make a tangible contribution to the scientific community.

Evaluating Grunion Response to Ecosystem Changes Forced by Recent Environmental Conditions in California's Oceans

by Lael Wakamatsu, Karen Martin, Sol Kim, Ariana Nickmeyer; *NASA DEVELOP-JPL*

The California grunion is an endemic fish species vital to the California coast, acting as a versatile food source for many species such as seabirds, large mammals, and other fish in the food web. This species, known primarily for the unique way in which they spawn, have two specialized regions. Historically, they only occur in Southern California and northern Baja California and are vulnerable to air and ocean temperature changes. In the last 16 years, scientists recorded grunion spawning further north to the San Francisco Bay area. In response to air and ocean temperature increases, the fish migrate to cooler waters they are more adapted to. This is an issue due to the fact that the grunion found here are much smaller in size, indicating the north coast may not be as suitable for the species. Increased beach activity, beach cleaning practices, and coastal erosion significantly contribute to the decrease in population and the significant shift of spawning areas. This project, in collaboration with the Grunion Greeters Project, used Aqua MODIS satellite data for sea surface temperature (SST) and chlorophyll-a concentration to create a time series of the California coast from 2003 to 2017. Analyzing this product will help predict grunion spawning areas and can be used to develop beneficial management practices as well as establish new protective areas to keep the species thriving and safe.

MPA Watch:

Community-Based Monitoring of Human Use in Marine Protected Areas

by Angela Kemsley; *WILDCOAST*

California's coastal and marine ecosystems produce some of the most important resources in the state; however, these ecosystems are some of the most exploited. Designed to protect the diversity and abundance of marine life while maintaining recreational access for people, marine protected areas (MPAs) protect over 16% of the California coast. Robust monitoring of the effectiveness of MPAs to conserve biodiversity is crucial to the continued success of the MPA network. Numerous efforts have been undertaken to monitor ecological change, but none have monitored human use of MPAs. MPA Watch was created as a citizen science initiative to collect data on coastal and marine resource use. Data are used to inform adaptive policy and management decisions as well as educate the public about marine stewardship. The MPA Watch network model is applicable across a range of locations and the data valuable to anywhere humans are using coastal or marine resources.

3

Using Citizen Science to Estimate Frequency of Latrine Site Usage Along Tributaries of Humboldt Bay by North American River Otters

by Korinna Domingo, Ximena Gil, and Dr. Jeffrey M. Black; *Humboldt State University*

Since 1999, citizen science volunteers have reported North American River Otters at 39 waterbodies in Humboldt, Del Norte, and adjacent counties in northern California. An average of 235 records per year have been reported (including scat, tracks and sightings), providing an index of use among sites ranging from high to low occurrence, depending on volunteers' participation (i.e. observer effort) or the otters themselves. Sightings of River Otters were reported at all times of the day. This study reports on the usefulness of a remote sensing camera (RSC) with night-time capabilities to better interpret the index of use provided by Citizen Science volunteers. The camera was positioned without bait and aimed at a rocky, shoreline latrine at an estuarine stream leading to Humboldt Bay. The latrine had been used by River Otters in use in all years of the study but to an unknown degree. The camera recorded a 20 sec video at each detection. River Otters triggered the camera 36 times (19 at night, 17 in the day) on 15 of the 53 camera-days. One (n = 22), two (n = 9) or three (n = 5) otters were counted during the 20 sec videos. Based on size and sex characteristics, we determined that the latrine was visited by a minimum of five individuals.

Human Dimensions & Citizen Science: Using Remote Sensing Cameras to Mitigate Wildlife Conflicts

by Korinna Domingo and Ron Dean; *Mountain Lion Foundation*

Footage obtained from remote sensing cameras can be powerful storytelling tools to encourage healthy coexistence with wildlife in local communities. Our focused three-month survey measured the frequency of mammalian occupation on a substantial privately owned property surrounded by both residential and natural areas in Arcata, California. Prior to our survey, citizen scientist Ron Dean spent three years documenting wildlife in his neighborhood after experiencing a mountain lion depredation. The objective of our study was to inform neighborhood residents about the variety of mammalian species present and how often they frequented this forested habitat. The following animals were observed: black bear, black tailed deer, bobcat, coyote, fisher, gray fox, mink, mountain lion, opossum, raccoon, and striped skunk. As representatives of the Mountain Lion Foundation's WildCameras program and our neighborhood, presentations have been made to the California Fish and Game Commission, demonstrating how citizen science and trail cameras can improve neighborhood wildlife conservation.

An Evaluation of Volunteer Effort in the Restoration of Terrestrial and Aquatic Resources in the Santa Monica Mountains

by Angela De Palma-Dow, J. Curti, D. Sharpton, E. Sode, S. Rubin, J. Smith, R. Kosugi, A. Shy-Sobol, T. Hayduk, J. Health, and B. Youngerman; *Mountains Restoration Trust*

Mountains Restoration Trust (MRT), a local land trust organized as a 501(c)(3) public benefit corporation based in Calabasas, CA, has been working in the community for over 35 years conserving the natural and cultural resources of the Santa Monica Mountains. MRT hosts weekly events of between 3 – 6 hours, where volunteers directly contribute to the restoration and ecosystem enhancement of the unique and diverse ecosystems of the Santa Monica Mountains. Volunteers participate in hands-on restoration activities such as planting native trees and shrubs, removing

4

An Evaluation of Volunteer Effort in the Restoration of Terrestrial and Aquatic Resources in the Santa Monica Mountains

Continued from page 4

invasive weeds, and conducting aquatic restoration by trapping and removing invasive red swamp crayfish. MRT has provided vegetation-based restoration opportunities for volunteers since 2010, where 14,000 MRT volunteers have planted 1,426 trees and 6,299 native plants. These efforts are valued over \$1,124,000 according to standard federal volunteer rates. For aquatic restoration, more than 3,400 volunteers have contributed their time and energy since 2015 and have removed 1,000 crayfish from streams. These efforts are valued at \$211,700. The effort of volunteers for restoration activities is essential for MRT to complete management goals and they serve as a method for the public to learn about and invest in their local natural resources. These programs encourage and enrich ideas of stewardship that will continue to percolate throughout the ecological and social community for generations to come.

Volunteer Research Programs Inform the Recovery of Rare Bird Species

by Josh Weinik; *Palos Verdes Peninsula Land Conservancy*

Citizen science research programs comprise an important component of annual biological monitoring activities of the Palos Verdes Peninsula Land Conservancy (Conservancy). The Conservancy coordinates two citizen science research projects designed to inform the natural resource management strategy of the Palos Verdes Nature Preserve (Preserve) and support mandated monitoring requirements of the Rancho Palos Verdes Natural Community Conservation Plan (NCCP). The Citizen Science Cactus Wren Monitoring Program studies the level of coastal cactus wren (*Campylorhynchus brunneicapillus*) inhabitation across patches of habitat within the Preserve. The cactus wren is a protected species under the NCCP and annual monitoring by citizen scientists supplement the triennial monitoring requirements for the species in order to better understand cactus wren response to yearly environmental conditions and their behaviors. Another research program, the Citizen Science Wildlife Tracking Program, monitors wild canid presence and movement across the Preserve using track and scat analysis as well as motion-activated cameras. The inclusion of motion-activated cameras has facilitated the identification of individual wild canids and lead to the only recent photographic documentation of the native gray fox (*Urocyon cinereoargenteus*) within the Preserve. Information regarding wild canid presence improves the understanding of predatory pressures on meso-predators, an important element of special status species recovery. Citizen scientists enable the Conservancy a broader and deeper look into species behaviors and utilization throughout the Peninsula's open space habitats and provide data to inform land management practices.

So Cal Sea Slugs — Diversity and Distribution

by Sarah Kaleel

Southern California provides a fantastic opportunity to view various types of sea slugs without having to be dive certified. Various marine slugs - from sea hares (*Aplysia*) to nudibranchs - can be found in tidal pools throughout the coast line. This visually driven presentation reviews the location and variation in sea slugs found in tide pool locations from San Diego up to Malibu, using citizen science data provided via iNaturalist to support sighting frequencies. This presentation is to provoke interest in the citizen science community to capture sea slug data while tide pooling and identify additional information while documenting animal activity.

5