



COLLECTION and EXPERIMENTAL ETHICS POLICY (CEEP)

BIOS COLLECTION AND EXPERIMENTAL ETHICS POLICY (CEEP)

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GENERAL OVERVIEW

The Bermuda Institute of Ocean Sciences (BIOS) has a deep respect for the natural environment of Bermuda and is dedicated to its preservation. BIOS does not sanction collecting for any purpose other than research or education. The following represents an overview of the BIOS *Collection and Experimental Ethics Policy*.

If you wish to engage in research and education at BIOS, you may be required to fill out forms describing your intended collecting and experimental activities. You will have to submit these forms *prior* to your arrival. To fill out the forms you will need to understand terms such as ‘*Limited Impact Research*’ and ‘*Approved Collecting Equipment*’. While at BIOS you may at any time be asked to explain/justify what you are doing to the ‘*Collection and Experimental Ethics Committee*’ and show your ‘*Collection and Experimental Manipulation Form*’. You will need to have recorded any collection you have done, and be able to document the fate of all organisms collected. If you wish to export any organisms you will need to apply for a Bermuda Government export permit (and maybe even a CITES permit). To understand these terms and their implications, it is important you read and understand this BIOS *Collecting and Experimental Ethics Policy*. The Policy applies to all educational and research activities at BIOS:

Guidelines for Educational activities - These are educational groups that come to BIOS for short periods, usually a week, as well as some BIOS-taught courses that may run up to 15 weeks. The short-term visiting groups often involve high school students, whilst the BIOS-taught courses more often involve graduate and undergraduate students. Our overarching philosophy for visiting groups, and especially those with younger students, is to maximize field observations and minimize collecting. Experimentation and/or manipulation is often discouraged and often impractical within the time duration. The group leader is in charge of obeying/enforcing the *Collection and Experimental Ethics Policy*. For the more long-term, BIOS-taught courses, the students are considered ‘scientists in training’ and collecting, experimentation and manipulation is sometimes involved, and students are taught elements of experimental design. The students themselves are in charge of understanding/obeying/enforcing the *Collection and Experimental Ethics Policy* and their activities and compliance are closely scrutinized by the course instructors.

Guidelines for Research activities - This includes BIOS faculty and staff, undergraduate and graduate interns who are working with faculty/staff, and visiting scientists and their students/staff. It is fully expected that these scientists are conducting research that includes collecting and experimentation as part of their academic program. Each scientist is in charge of obeying/enforcing the *Collecting and Experimental Ethics Policy*.

Major points:

- All collecting activity and experimental activities at BIOS are overseen by the *BIOS Collection and Experimental Ethics Committee*, which is composed of BIOS resident staff/scientists, resident Educators/Instructors and members of BIOS senior management. The committee is responsible for the *Collection and Experimental Ethics Policy (CEEP)* and the Committee has the responsibility to evaluate and inspect the facilities of all scientists using animals for research or teaching, and to assure the humane handling, care, treatment, and transportation of the animal species;
- Group leaders and Instructors of BIOS courses, and BIOS resident scientists and visiting scientists, are responsible for ensuring group members and associates adhere to the *Collection and Experimental Ethics Policy* and all parties are answerable to the *BIOS Collection and Experimental Ethics Committee*;
- The *BIOS Collection and Experimental Ethics Policy* utilizes a concept of *Limited Impact Research (LIR)* whereby accredited institutions may carry out research activities that are deemed to have limited impact without requiring a special permit from government for each and every experiment or collecting activity. The key parts of this management strategy are (1) a clear and comprehensive definition of '*Limited Impact Research*' - see page 6 - and (2) sufficient internal controls on research activities are in place such that external controls on minor work are not necessary;
- Research and Education conducted within the terms of *LIR* will not require a collecting permit from the Bermuda Government or special consideration from the *BIOS Collection and Experimental Ethics Committee*. Figure 1 (below) indicates the decision-making process for engaging in educational and/or research activities at BIOS involving any specimen collecting and/or manipulative research and what forms need to be filled out and submitted and to whom;
- The '*Planned Collection and Experimental Manipulation Form*' is the main mechanism whereby BIOS screens potential visitors to BIOS and assesses whether their proposed activities are consistent with the *Collection and Experimental Ethics Policy*. The '*Realized Collection and Experimental Manipulation Form*' is the main mechanism whereby BIOS accounts for removal of organisms from the environment;
- Visiting scientists and visiting group leaders wishing to conduct research or education at BIOS involving collecting and/or field experiments are required to submit a '*Planned Collection and Experimental Manipulation Form*' at least 1 month before the group's arrival at BIOS and to turn the '*Planned Collection and Experimental Manipulation Form*' into a '*Realized Collection and Experimental Manipulation Form*' at the end of their stay;
- Collecting of any samples that will ultimately be shipped out of Bermuda will require an Export permit from the Department of Environmental Protection (Ministry of the Environment). Some organisms i.e. corals, may also require a CITES permit. Arranging CITES and Export permits make take at least 1 month to organize;
- For experimental ethics purposes, complex organisms are deemed to include all vertebrates (mammals, birds, reptiles, amphibians and fish), as well as higher invertebrates (for example cuttlefishes, squids, octopuses, shrimps, crabs and lobsters of various families);
- Researchers wishing to conduct experiments with complex organisms that are likely to compromise the wellbeing of those organisms have to present a research plan to the *BIOS Collecting and Experimental Ethics committee* for approval in which they have to outline the benefits to be derived from conducting the experiment, and include details such as the total number of organisms involved, duration of the study, details of all procedures and protocols in place to ensure the welfare of the organisms during the study period. All funding sources for such experiments must also be disclosed;
- There are explicit rules on euthanasia and humane disposal of 'complex organisms' and disposal of the remains of test organisms.

You are a visiting scientist(s), visiting group leader, BIOS-taught course leader, BIOS resident scientist(s), or student on a BIOS taught course in which collecting is permitted

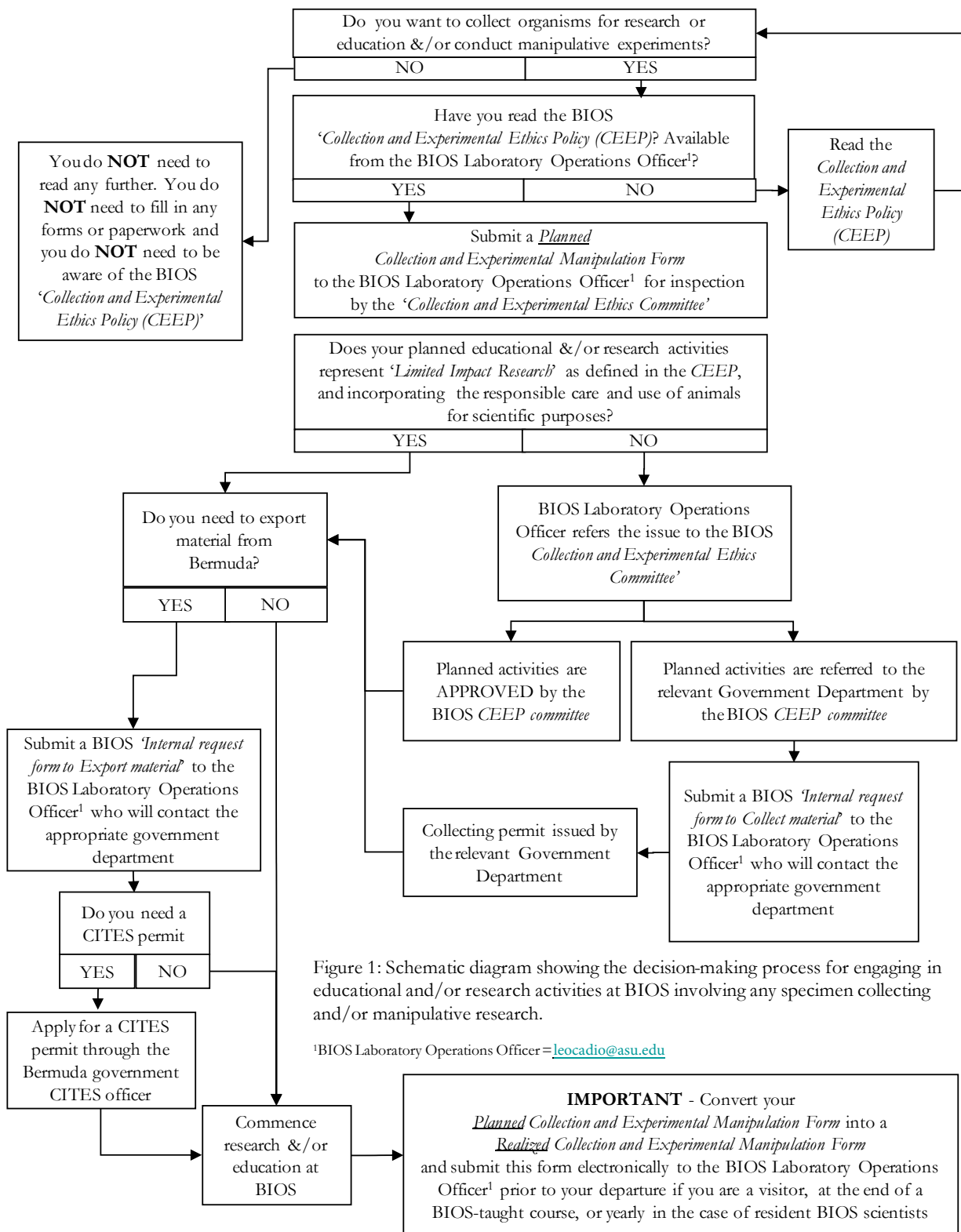


Figure 1: Schematic diagram showing the decision-making process for engaging in educational and/or research activities at BIOS involving any specimen collecting and/or manipulative research.

¹BIOS Laboratory Operations Officer = leocadio@asu.edu

COLLECTION AND EXPERIMENTAL ETHICS POLICY

VISITING GROUPS and COURSES RUN BY BIOS:

All visiting groups and BIOS-taught courses (e.g., fall, summer, and spring semester courses, that are taught or co-taught by BIOS faculty) are required to follow the BIOS *Collection and Experimental Ethics Policy*. This policy does not cover student internships (e.g., Princeton Interns, Galbraith Interns, Volunteer Interns) who follow the Collection Protocols for Researchers (see below).

- 1) The Group Leader, or BIOS Course instructor, is in charge of making each student and chaperone/teaching assistant aware of the BIOS *Collection and Experimental Ethics Policy*, and is responsible for enforcing/obeying the policy as well as all Bermuda Government policies/laws regarding sample collection.
- 2) Whenever possible Group Leaders, or BIOS-taught course instructors, are urged to design programs that will cause the minimum environmental impact. Suggestions for such program elements are given below. If collecting and/or field experiments are required as an integral part of the educational program, a '*Planned Collection and Experimental Manipulation Form*' (see below) must be submitted at least *1 month* before the visiting group's arrival at BIOS, or the start of a BIOS-taught course¹.
- 3) The '*Planned Collection and Experimental Manipulation Form*' must be converted into a '*Realized Collection and Experimental Manipulation Form*' (see Schedule 7) which must be signed and submitted as an electronic copy prior to departure from BIOS (or at the end of a BIOS taught course).
- 4) The '*Planned Collection and Experimental Manipulation Form*' is the main mechanism whereby BIOS screens potential visitors to BIOS and assesses whether their proposed activities are consistent with the *Collection and Experimental Ethics Policy*. The '*Realized Collection and Experimental Manipulation Form*' is the main mechanism whereby BIOS accounts for removal of organisms from the marine environment. As such all activities of Visiting groups and BIOS-taught courses will be closely scrutinized with respect to timely submission of these documents.
- 5) An example of a '*Realized Collection and Experimental Manipulation Form*' is given in Schedule 7.
- 6) All collecting and manipulative work conducted by visiting groups and BIOS-taught courses have to be conducted under what is termed '*Limited Impact Research*' – or under a collecting permit from the relevant government department - and there are explicit definitions of what this involves, how much of what can be taken and from where, and how experimental organisms are treated and disposed of. These terms are defined in the following sections and schedules.
- 7) All Electronic forms are available from the BIOS Lab Operations Officer (bruce.williams@bios.edu).

Suggestions for minimizing the environmental impact of Educational programs²:

The following notes are guidelines amalgamated from various successful programs. Hopefully some of these ideas may be useful in helping minimize our impact and compliance with Bermuda Government policy.

- Make observations *in situ* rather than collecting. Underwater slates are excellent, inexpensive tools for this, and can lead to the development of observational and scientific sketching skills. Check out the book *Keeping a Nature Journal* for ideas: <http://store.clemetparks.com/product84.html>;
- Photo-document rather than collect specimens. This is a great additional exercise and an excellent

¹ Note: For the Fall Semester 'Research' course, item #2 will be completed by each student (or student working group) and turned in to the instructor for evaluation before the project begins. If the instructor has questions about a given student project, the *Collection and Experimental Ethics Committee* would be contacted. Item #3 will be required as part of the project (i.e. grades will not be given if a student has not finished #3).

² BIOS would like to thank all group leaders whose low impact programs have been models for us to follow and who have advised us on these recommendations. We believe that demonstrating such respect for the environment is one of the best lessons we can teach our students. Any further suggestions would be welcomed.

complement to a species list. Some teachers have created a cross curricular IT exercise using a database, by having students create their own species list with digital pictures, taxonomic classification and general description: IT, Language Arts, biology, mathematics...!

- Restoration projects: we encourage groups to participate in woodland restoration projects at Ferry Reach and Coopers Island. These on-going efforts require lots of willing workers, and provide excellent illustrations of threats to Oceanic Islands and the concept of endemic flora and fauna;
- Inter-tidal surveys: students armed only with slates and an ID guide can gather a large amount of useful data on invertebrates on the rocky shore. Several species in this zone are in decline and observational data can be very useful in monitoring them;
- Remind students to avoid touching corals entirely and to limit handling of invertebrates. Encourage students to return inter-tidal rocks to their original locations after making observations.

COLLECTION AND EXPERIMENTAL ETHICS POLICY RESIDENT AND VISITING RESEARCH SCIENTISTS

This policy is designed to cover resident BIOS scientists, and any interns, research students, or assistants/technicians working under them (i.e. volunteer interns, Princeton Research Interns, REU students, and graduate students), as well as visiting scientists and their students, interns and research assistants/technicians.

- 1) Every BIOS resident scientist, or visiting scientist, and all under their supervision, are in charge of obeying/enforcing the BIOS *Collecting and Experimental Ethics policy*, as well as all Bermuda Government policies/laws regarding specimen collection.
- 2) Visiting scientists that have no affiliation with a resident BIOS scientist are required to apply to the BIOS *Collecting and Experimental Ethics Committee* for permission for any collection activities or manipulative field experiments. This involves filling in a '*Planned Collection and Experimental Manipulation Form*' at least *1 month* prior to their arrival at BIOS and submitting it to the BIOS Lab Operations Officer (bruce.williams@bios.edu).
- 3) Every BIOS resident scientist, or visiting scientist, must maintain and upkeep a '*Realized Collection and Experimental Manipulation Form*' outlining all collecting and experimental/manipulative field work carried out while at BIOS. In the case of visiting scientists, these logs must be submitted electronically to BIOS (leocadio@asu.edu) on departure, or yearly in the case of resident scientists. All forms may be requested/inspected by the BIOS *Collecting and Experimental Ethics Committee* at any time.
- 4) The '*Planned Collection and Experimental Manipulation Form*' is the main mechanism whereby BIOS screens potential visitors to BIOS and assesses whether their proposed activities are consistent with the *Collection and Experimental Ethics Policy*. The '*Realized Collection and Experimental Manipulation Form*' is the main mechanism whereby BIOS accounts for removal of organisms from the marine environment. As such accurate record keeping will be checked throughout the year.
- 5) An example of a '*Realized Collection and Experimental Manipulation Form*' is given in Schedule 7. All Electronic forms are available from BIOS (leocadio@asu.edu).
- 6) Use of any materials collected in Bermuda must follow applicable Bermuda laws and regulations pertaining to commercial activities.

THE LIMITED IMPACT RESEARCH PHILOSOPHY

This portion of the document deals with collecting and is based on the current environmental policies of the Bermuda Government, as well as policies in place in Australia under the Great Barrier Reef Marine Park Authority (GBRMPA), and internal policies followed by research institutions that operate under the constraints of GBRMPA. It is based on the principle of '*Limited Impact Research (LIR)*', whereby scientists or educators working within accredited institutions, may carry out research activities that are deemed to have limited impact without requiring an individual special permit issued from the Government. The key parts of this management strategy are (1) accreditation, whereby an institution demonstrates that sufficient internal controls on research activities are in place such that external controls on minor work are not necessary; and (2) a clear and comprehensive definition of '*Limited Impact Research*'.

Policies on collection:

For visiting groups, BIOS-taught courses, visiting or residents scientists:

- 1) Non-extractive activities without discernable impacts (see Schedule 1) and using approved techniques (see Schedule 2) are considered *Limited Impact Research* and will not require a special permit issued to the individual by the relevant Government Department. Extractive activity that does not involve taking of Protected Species (Schedule 3), or the taking of species within certain collecting limits (Schedule 4), and that is not conducted in protected habitats and locations (Schedule 5), and uses approved collecting equipment (Schedule 6), is also considered *Limited Impact Research*, and will not require a special permit to be issued to the individual by the relevant Government Department.
- 2) If any proposed activities fall outside the definition of *Limited Impact Research*, and requires a permit from the relevant Government Department, the application for a permit must be submitted via the BIOS (leocadio@asu.edu). This application is in the form of a '*BIOS internal request for a collection/export permit form*' available from the BIOS Lab Operations Officer.
- 3) Equipment for field experiments should fall within the limitations of *LIR*, or a permit should be sought from the relevant Government Department. Relevant agencies should be notified of large scale field experiments in nearshore waters. Markers for field experiment sites should either fall with the limitations of *LIR* or should follow Marine and Ports Department regulations for fixed moorings. See Schedule 2 for *LIR* equipment approved for long-term field placement.
- 4) Collection of organisms (other than certain corals) that are specifically protected under Bermuda laws and regulations or international laws or conventions (e.g. CITES), whether permanently or on a seasonal basis, is not considered *LIR*, and requires a collecting permit from the relevant Government Department. See Schedule 3 for protected taxa.
- 5) Collecting or experimentation in habitats, or designated areas, specifically protected under Bermuda laws or regulations is not considered *LIR*, and requires a permit from the relevant Government Department. This applies to caves, Marine Protected Areas, etc.. See Schedule 4 for protected areas.
- 6) Collecting specimens with equipment other than that ordinarily permitted under Bermuda laws or regulations, or using permissible equipment outside of its legally permitted uses, is not considered *LIR* and requires a collecting permit from the Bermuda Government (e.g. large nets, spearguns and fish poisons are prohibited, and thus require a permit, as does use of pole spears within 1 mile of shore and/or in conjunction with SCUBA). See Schedule 5 for *LIR* approved and prohibited equipment.
- 7) Collection should be kept to the minimum quantities required to successfully complete the research or educational objectives. If large quantities of a particular organism are required, the collecting effort should be spread out as much as is practicable in order to minimize the impact on any given area. The *LIR* limits for collection of specimens of a given species, both in terms of absolute numbers and in terms of numbers per location, are set out in Schedule 4. If it is not possible to collect enough specimens within the limits stipulated under the *LIR* restrictions, then permission from the *Collecting and Experimental Ethics Committee* or a collecting permit from the relevant Bermuda Government Department is required.

- 8) Collecting of any samples that will ultimately be shipped out of Bermuda requires an Export permit from the Department of Environmental Protection (Ministry of the Environment). A resident BIOS scientist can undertake collection activities for export whilst an export permit is pending, as long as collection activities fall within the definition of *LIR*. A visiting scientist may also undertake collection activities for export whilst the export application is pending, as long as (1) the collection activities fall within the definition of *LIR* and (2) the CEEP committee has been informed and have approved the activity. An example of a 'BIOS Internal Request for an Export Permit Form' is given in Schedule 9. All Electronic forms are available from BIOS (leocadio@asu.edu) and *all* requests for Export permits must be submitted to the relevant Government Department via the BIOS Lab Operations Officer. *Note: it make take up to a month for an Export permit to be issued;*
- 9) Any collecting activities should take account of public sensibilities and perceptions, and should be conducted as discretely as possible, avoiding areas frequented by members of the general public and tourists.

CARE AND USE OF ANIMALS FOR SCIENTIFIC PURPOSES

The *BIOS Collecting and Experimental Ethics Committee* has the responsibility to evaluate, report on, and inspect the facilities of all scientists using animals for research or teaching and to assure the humane handling, care, treatment, and transportation of the animal species. This portion of the document dealing with experimentation are based on the principles of the Australian 'Code of Practice for the Care and Use of Animals for Scientific Purposes' (7 Edition 2004), the 'Queensland (Australia) Government Animal Care and Protection Act 2001', and the 'Canadian Council on Animal Care Guidelines on the Care and Use of Fish in Research'. This material is available in PDF format on BIOS servers. All resident visiting scientists intending to work on vertebrates (i.e. fish) or higher invertebrates from the class Cephalopoda (cuttlefishes, squids, octopuses) and the orders Stomatopoda and Decapoda of the class Malacostraca (shrimps, crabs and lobsters of various families) must be familiar with the contents of these documents and how it applies to their activities. As a starting guide, scientists that may be involved in experimentation on vertebrates or higher invertebrates should read the publication:

Sherwin CM et al. (2003) Guidelines for the ethical use of animals in applied ethology studies. Applied Animal Behaviour Science Vol. 81 291-305

Policies on experimentation:

- 1) According to U.S. federal law, institutions that use laboratory animals for research or instructional purposes must establish a committee to oversee and evaluate all aspects of the institution's animal care. At BIOS this is undertaken by the *BIOS Collecting and Experimental Ethics Committee*.
- 2) Specimens collected for experimental procedures should be collected following the collecting policies outlined above, with permits acquired as necessary. This applies regardless of whether the intention is to return the organisms to the field on completion of the experiment.
- 3) Experimental organisms should be kept adequately fed in appropriate conditions within their normal range of environmental tolerances, unless the express purpose of the experiment is to determine the effects of exposure to parameters outside the normal range.
- 4) Schedule 8 sets out 8 levels of 'interference' that may be encountered under various experimental scenarios. Experimentation should be carried out at the lowest level of interference under which the experimental goals can be achieved.
- 5) Researchers wishing to conduct experiments on complex organisms should present a research plan to the *BIOS Collecting and Experimental Ethics Committee* for approval (see Schedule 8 for a list of organisms to which this applies). Proposals should demonstrate the benefits to be derived from conducting the experiment, and include total number of organisms involved, duration of the study, details of all procedures and protocols in place to ensure the welfare of the organisms during the

study period. All funding sources for such experiments must be disclosed.

- 6) Any organisms that must be sacrificed for research purposes should be euthanized (where *euthanasia* = the act of inducing humane death in an animal as quickly and as humanely as possible), following accepted guidelines where available. Cold euthanasia i.e. immersion in iced seawater is generally deemed appropriate for most 'complex marine organisms'. See Schedule 8 for definition of 'complex marine organisms'. Any other proposed methods for euthanasia should be cleared with the BIOS Collecting and Experimental Ethics Committee.
- 7) Experiments involving 'death' as an end point without the use of euthanasia (procedures at interference level 8 under Schedule 8. e.g. LD₅₀/LC₅₀ assays) should not be carried out on complex organisms. In exceptional cases, the BIOS Collecting and Experimental Ethics Committee will consider authorizing such experiments if adequate justification can be given regarding the wider benefits of undertaking a study of this nature. Approval of the committee must be sought before applying for funding.
- 8) At the end of the experiment, organisms that must be sacrificed as part of the experimental protocols, organisms that have become incapacitated over the course of the experiment, and organisms that have been exposed to disease or contaminants that would pose a threat to other organisms in the wild if they were to be released, should be euthanized as quickly and as humanely as possible, following accepted guidelines where available. (Cold euthanasia – immersion in iced seawater – is deemed appropriate for most complex marine organisms) See Schedule 8 for definition of complex marine organisms. Any other proposed methods for euthanasia³ should be cleared with the BIOS Collecting and Experimental Ethics Committee.
- 9) The remains of any organisms that have been exposed to disease or contaminants should be disposed of through the waste management system and should not be disposed of at sea. The remains of organisms that have not been exposed to disease or contaminants may be disposed of at sea or a shoreline, preferably in a well-flushed location.
- 10) Any organisms that have not been exposed to disease or contaminants that would pose a threat to other organisms in the wild, and which remain healthy at the end of the experimental period, should be returned to the location from which they were collected. Sessile organisms should be reattached to similar substrate from which they were taken if possible.

Schedule 1 – Non-extractive *Limited Impact Research* equipment for temporary field placement

(Temporary field equipment may only be deployed while research personnel are present at the site)

- Non-fixed transect tapes or chains;
- Non-fixed quadrats;
- Temporary sub-surface floats tied to a small weight;
- Temporary surface marker buoys affixed to a person, or tied to a small weight, a stake/pin driven into bare substrate, or a U-shaped rod driven into the sand, where stakes/pins/rods will be removed when the research is completed.

Care should be taken to ensure that any lines will not become entangled on living organisms.

Schedule 2 – *Limited Impact Research* approved equipment for long-term field placement

Approved:

- Fish tags of a recognized standard/tested/approved design;
- Stakes up to 12 mm diameter, affixed in bare substrate and protruding less than 50 cm from the substrate, marked as necessary – not more than 20 per site;
- Bolts or pins less than 10 mm in diameter, affixed in bare substrate and protruding less than 10 cm from the substrate – not more than 200 per site;
- Data loggers affixed to weights, buoys or stakes/pins affixed in bare substrate;
- Subsurface floats less than 10 cm diameter, stationed at least 2 m below the surface and tied to a stake/pin driven into bare substrate, or a U-shaped rod driven into the sand, not more than 20 per site. Care should be taken to ensure that the line will not become entangled on living organisms;
- Fixed, non-mechanical sediment or seawater sampling devices - must not interfere with live surroundings or boating activities; to be removed at the end of the experimental period;
- Fixed settlement attractors, Fixed grow out/acclimation explant structures, or Fixed structures associated with manipulative experiments – not more than 50 cm in any one dimension; not more than 5 per site; to comply with the requirements for stakes or floats as appropriate; must not interfere with live surroundings or boating activities; all equipment to be removed at the end of the experimental period;
- Large fixed structures (any dimension exceeding 50 cm), or large numbers of such structures, designed specifically to have a particular *in situ* effect on living organisms and their surroundings require a permit.

Consult the Department of Marine and Ports Services regarding the placement of permanent or semi-permanent buoys and the Departments of Marine Resources and Conservation Services regarding long-term field equipment other than that listed above.

Schedule 3 – Protected species for which a collecting permit must be requested (standard permit type in brackets if available)

Note: All Scleractinia, Milleporina and Antipatharia plus the Alcyonaria are protected by the Bermuda Government under the Fisheries Act. Although certain families of Scleractinia, the Milleporina and the Gorgonacea are exempted from permitting requirements under the BIOS *LIR* terms, the Scleractinia, Milleporina and Antipatharia are also protected under CITES. Therefore any hard corals that will ultimately be exported must have a CITES export permit. In order to obtain a CITES export permit, a collecting permit must be shown.

| Major taxon | Protection | Family/Species | Common name | Permit type |
|-----------------|---------------------------------|---|---|--|
| Mammalia | Fully protected | | whales/dolphins | |
| Reptilia | Fully protected | | all turtles | |
| Fish | Fully protected | <i>Epinephelus striatus</i> <i>E. morio</i> <i>Alphistes afer</i> <i>Mycteroperca tigris</i> <i>M. microlepis</i> <i>M. venenosa</i> <i>Aetobatus narinari</i> Scaridae Hippocampus | Nassau grouper Red grouper Mutton Hamlet Tiger grouper Gag grouper Yellowfin grouper Spotted Eagle ray All parrotfishes All Seahorses | |
| | CITES | Syngnathidae | Seahorses/Pipefish | CITES |
| P. Mollusca | Fully protected | <i>Strombus gigas</i> <i>S. costatus</i> | Queen conch Harbour conch | |
| | | <i>Cittarium pica</i> F. Conidae | Topshell Cone shells | |
| | | F. Olividae <i>Euvola ziczac</i> <i>Argopecten gibbus</i> <i>Pinctada imbricate</i> Cassidae <i>Macrocallista maculata</i> | Olives (Netted olive) Bermuda scallop Calico scallop Pearl oyster Helmets/Bonnets Calico clam | |
| SP. Crustacea | Seasonal Protection | <i>Panulirus argus</i> | Spiny lobsters | Recreational permit in season |
| O. Antipatharia | Fully protected/CITES | | Black corals | Bermuda Government & CITES |
| O. Scleractinia | Fully protected/CITES | F. Caryophylliidae F. Guyniidae F. Denrophylliidae F. Rhizangiidae | Tube corals | Bermuda Government & CITES |
| O. Scleractinia | Fully protected/CITES protected | F. Astrocoeniidae F. Pocilloporidae F. Agariciidae F. Siderastreidae F. Poritidae F. Faviidae F. Oculinidae F. Meandrinidae F. Mussidae | Common Hard corals | Bermuda Government & CITES permits required for export and for collecting that exceeds the terms of <i>LIR</i> |

Schedule 3 – Protected species for which a collecting permit must be requested (standard permit type in brackets if available) – continued

| | | | | |
|----------------------------------|---------------------------------|----------------------------|---|--|
| O. Milleporina | Fully protected/CITES protected | F. Milleporidae | Fire corals | Bermuda Government & CITES permits required for export and for collecting that exceeds the terms of <i>LIR</i> |
| O. Alcyonacea O. Pennatulacea | Fully protected/CITES protected | All species All species | Soft corals Sea Pens | Bermuda Government & CITES permits required for export and for collecting that exceeds the terms of <i>LIR</i> |
| O. Gorgonacea | Fully protected/CITES protected | All species | Sea fans Sea rods, Sea plumes Sea feathers Sea fingers Sea whips | Bermuda Government & CITES permits required for export and for collecting that exceeds the terms of <i>LIR</i> |

Schedule 4 – *Limited Impact Research* collecting limits

In addition to the species listed in Schedule 3, there are the following general restrictions on *LIR* collecting:

Gamefishes, elasmobranchs (sharks and rays) and fishes of the family Serranidae (with the exception of the genera *Anthias*, *Hypoplectrus*, and *Rypticus*) may not be collected under *LIR*, regardless of their protection status, unless collecting in conjunction with a licensed commercial or charter fishing operation.

The endemic species *Caulolatilus bermudensis*, *Lythrypnus mowbrayi* and all *Fundulus spp.* and the families Dactyloscopidae, Molidae and Eleotridae may not be collected without a permit.

Species from the class Asteroidea, with the exception of *Linckia guildingii* and *Coscinasterias tenuispina*, may not be collected under *LIR*.

Species collection limits as set out below do *not* apply to the larval forms of these organisms should such larvae occur in general plankton samples.

Definitions:

- 1) Skeleto-tissue sample/sample – subsample of colonial organism equivalent to not more than 10% of the total colony area;
- 2) Tissue sample/sample – sample of tissue taken from an individual equivalent to not more than 5% of the organism’s mass and that will not impact that individual’s ability to survive and function in either the short or long term;
- 3) Branch (referring to branching scleractinians and gorgonians) – single or forked subunit of branching colony or portion thereof, typical of what are recognized as branches for that specific organism but not exceeding 20cm in length;
- 4) Multibranch sample (in branching scleractinians) – equivalent to 10 typical branches;
- 5) Legal size – Any fish collected under *LIR* must comply with legal minimum or maximum size limits (to collect specimens outside of these limits requires a permit);
- 6) Current size limits on *LIR* species (to be checked and updated annually as necessary):
 - Yellowtail snapper (*O. chrysurus*) – 30 cm;
 - Lane snapper (*L. synagris*) – 25 cm;
 - Hogfish (*L. maximus*) – 45 cm.
- 7) Bag limits – Any fish collected under *LIR* must be captured at a rate that complies with the legal bag limits;
- 8) Current bag limits on *LIR* species (to be checked and updated annually as necessary):
 - Lane Snapper (*L. synagris*) – 30 per day

Schedule 4 – Limited Impact Research collecting limits - continued

| | Category | Annual limit (per species per project) | Annual limit (per species per site per project) |
|----------|--|---|--|
| <u>1</u> | <u>Common massive coral species</u> <i>Diploria spp.</i> <i>Montastraea spp.</i> | 20 colonies 100 skeleto-tissue samples | 5 colonies 10 skeleto-tissue samples |
| <u>2</u> | <u>Common sub-massive coral species</u> <i>Porites astreoides</i> <i>Siderastrea spp.</i> <i>Favia fragum</i> | 40 colonies 100 skeleto-tissue samples | 10 colonies 15 skeleto-tissue samples |
| <u>3</u> | <u>Uncommon submassive coral species</u> <i>Stephanocoenia michelinii</i> <i>Agaricia fragilis</i> <i>Isophyllia sinuosa</i> | 20 colonies 80 skeleto-tissue samples | 5 colonies 10 skeleto-tissue samples |
| <u>4</u> | <u>Rare submassive coral species</u> <i>Meandrina meandrites</i> <i>Dichocoenia stokesi</i> <i>Scolymia spp.</i> | 5 colonies 10 skeleto-tissue samples | 1 colony 2 skeleto-tissue samples |
| <u>5</u> | <u>Common branching coral species</u> <i>Madracis mirabilis</i> | 30 multi-branch samples 300 branches | 10 multi-branch samples 100 branches |
| <u>6</u> | <u>Other branching coral species</u> <i>Oculina spp.</i> <i>Madracis decactis</i> <i>Porites porites</i> | 15 multi-branch samples 150 branches | 5 multi-branch samples 50 branches |
| <u>7</u> | <u>Common gorgonians</u> <i>Plexaura spp.</i> <i>Pseudoplexaura spp.</i> <i>Plexaurella spp.</i> <i>Pseudopterogorgia spp.</i> | 30 colonies 150 branches/samples | 5 colonies 25 branches/samples |
| <u>8</u> | <u>Uncommon gorgonians</u> <i>Eunicea spp.</i> <i>Muricea spp.</i> | 15 colonies 25 branches/samples | 3 colonies 5 branches/samples |
| <u>9</u> | <u>Rare gorgonians</u> <i>Briareum polyanthes</i> <i>Ellisella spp.</i> <i>Pterogorgia spp.</i> | 5 colonies 10 branches/tissue samples | 1 colony, 2 branches/tissue samples |
| 10 | O. Alcyonacea, O. Pennatulacea | 2 of each species | 2 of each species |
| 11 | O. Stomatopoda, O. Decapoda | 30 of each species | 5 of each species |
| 12 | O. Octopoda, | 30 of each species | 5 of each species |

Schedule 4 – Limited Impact Research collecting limits - continued

| | Category | Annual limit (per species per project) | Annual limit (per species per site per project) |
|----|--|---|---|
| 13 | <u>Common colonial invertebrates</u> O. Zoanthidea (<i>except I. duchassaingi</i>) P. Bryozoa Colonial Ascidiacea | Unlimited samples (<10% of colony). If greater >10% follow the guidelines for 'Fairly common invertebrates' (see below) | Unlimited samples (<10% of colony). If greater >10% follow the guidelines for 'Fairly common invertebrates' (see below) |
| 14 | <u>Rare invertebrates</u> <i>Isaurus duchassaingi</i> F. Triviidae S.F. Cypraeacea F. Naticidae F. Tonnidae S.F. Cymatiacea F. Muricidae O. Sepioidea <i>Diadema antillarum</i> <i>Euclidaris tribuloides</i> C. Echinoidea (urchins) unless listed C. Holothuroidea (cucumbers) unless listed P. Hemichordata | 5 individuals of each species | 1 individual of each species |
| 15 | <u>Uncommon invertebrates</u> F. Janthinidae, F. Aclididae, F. Epitoniidae O. Anaspidea O. Notaspidea O. Ascoglossa O. Nudibranchia C. Scaphopoda <i>Linckia guildingii</i> <i>Coscinasterias tenuispina</i> C. Ophiuroidea <i>Echinometra lucunter</i> | 25 individuals of each species 50 tissue samples | 5 individuals of each species 25 tissue samples |
| 16 | <u>Fairly common invertebrates</u> O. Corallimorpharia O. Actinaria (anemones) unless listed C. Gastropoda (snails) unless listed C. Bivalvia (bivalves) unless listed O. Teuthoidea P. Phoronidae, P. Brachiopoda <i>Holothuria parvula</i> , <i>H. arenicola</i> , <i>H. surinamensis</i> <i>Synaptula hydriformis</i> C. Ascidiacea | 50 individuals 100 tissue samples | 10 individuals 25 tissue samples |

Schedule 4 – Limited Impact Research collecting limits - continued

| | Category | Annual limit (per species per project) | Annual limit (per species per site per project) |
|-----------|--|---|--|
| <u>17</u> | <u>Common invertebrates</u> <i>Bartholomea annulata</i> <i>Lebrunia danae</i> <i>Bunodeopsis antillensis</i> <i>Isostichopus badionotus</i> | 100 individuals 1000 tissue samples | 15 individuals 1000 tissue samples |
| <u>18</u> | <u>Abundant invertebrates</u> <i>Aiptasia pallida</i> O. Myoidea <i>Tripneustes ventricosus</i> | 200 individuals 1000 tissue samples | 20 individuals 1000 tissue samples |
| <u>19</u> | <u>Abundant invertebrates</u> <i>Lytechinus variegatus</i> | 200 individuals 1000 tissue samples | 24 individuals 1000 tissue samples |
| <u>20</u> | <u>Uncommon fishery species</u> <i>Lachnolaimus maximus</i> <i>Tarpon Atlanticus</i> <i>Albula vulpes</i> | 30 individuals | 2 individuals |
| <u>21</u> | <u>Common fishery species</u> F. Lutjanidae | 60 fish of legal size | 10 fish of legal size |
| <u>22</u> | <u>Abundant fishery species</u> F. Haemulidae F. Carangidae not otherwise listed | 100 adults, 150 juveniles | 10 adults, 30 juveniles |
| <u>23</u> | <u>Baitfishes</u> F. Atherinidae F. Clupeidae F. Engraulidae | 3,000 individuals | 500 individuals |
| <u>24</u> | <u>Rare fish species/families</u> O. Gadiformes O. Lophiiformes O. Atheriniformes except F. Atherinidae F. Chlopsidae F. Antennariidae F. Ogcocephalidae F. Echeneidae <i>Anarchias similis</i> <i>Cbannomuraena vittata</i> <i>Myrichthys platyrhynchus</i> <i>Arisoma balearicum</i> <i>Sargocentron bullisi</i> <i>Apogon gouldi</i> <i>Doronotatus megalepis</i> <i>Halichoeres pictus</i> <i>Halichoeres bathyphilus</i> <i>Bothus maculiferus</i> | 5 individuals | 1 individual |

Schedule 4 – *Limited Impact Research* collecting limits - continued

| | Category | Annual limit (per species per project) | Annual limit (per species per site per project) |
|-----------|--|---|--|
| <u>25</u> | <u>Uncommon fish species/families</u> O. Anguilliformes unless listed O. Tetraodontiformes | 10 individuals | 1 individual |
| <u>26</u> | <u>Other fish families</u> not otherwise protected, within the limits of fisheries regulations | 25 of each species | 2 of each species |
| <u>27</u> | <u>Common fish species/families</u> F. Labridae not otherwise listed F. Acanthuridae F. Gerreidae <i>Diplodus bermudensis</i> <i>Kyphosus sectatrix</i> | 100 individuals | 25 individuals |
| <u>28</u> | <u>Wet sediment + biota</u> | 50 L | 5 L |
| <u>29</u> | <u>Algae</u> | 5 kg wet weight | 1 kg wet weight |
| <u>30</u> | <u>Seagrasses</u> | 10,000 shoots of each species | 1,000 shoots of each species |
| <u>31</u> | <u>Mangroves</u> | Sprouted seedlings/trees are protected; Unlimited propagules for restoration projects 5 × 50 cm long roots (for studies of fouling communities) | Sprouted seedlings/trees are protected; 500 propagules for restoration projects; 1-2 × 50 cm long roots (for studies of fouling communities) |

Schedule 5 – Protected habitats and locations

Protected habitats and locations include (1) the North and South Shore Coral Reef Preserves (2) 29 Fisheries Protected Areas/MPAs (see below) (3) Walsingham Marine Park (4) Seasonally protected Fisheries areas to the southwest and north east of the island (5) All cave habitats (6) Enclosed bays such as Coot Pond, Whalebone Bay, Shelly Bay and Somerset Long Bay (which are protected from net fishing).

BIOS considers Whalebone Bay a special case as due to its proximity, it is used frequently for field trips. Collecting or manipulative field experiments should not be undertaken in this area. In exceptional cases, the BIOS *Collecting and Experimental Ethics Committee* will consider authorizing activities at Whalebone Bay if adequate justification can be given as to why this area is the most suitable for a given activity.

Given the constraints of the scientific hypothesis being tested, it would also be preferable not to collect in any enclosed or semi-enclosed bays, or harbours (such as Castle Harbour), or locations close to shore.

In protect areas the following is prohibited

- (1) the taking of any marine organisms (i.e. plants or animals) of all descriptions - where 'taking' means injuring, capturing, killing, destroying, collecting and being in possession and 'fish' means any marine organism whether alive or dead;
- (2) the of any anchor other than a Danforth (sand) anchor.

Enclosed Bays

Shelly Bay — that body of water enclosed on the Western margin by a line running due South from the Westernmost tip of Bowen Point; and on the Eastern and Northern sides by the shores of Hamilton Island;

Somerset Long Bay — that body of water enclosed by a line running from King's Point, Sandy's Parish to Daniel's Head, Sandy's Parish and the shores of Somerset Island;

Whalebone Bay — that enclosed body of water commonly known as Whalebone Bay, St. George's Parish; Coot Pond — that enclosed body of water commonly known as Coot Pond, St. George's Parish,

North Shore Coral Reef Preserve

All that area bounded:

- (a) on the South, by a straight line drawn in a direction East true from the most northerly extremity of Commissioner's House on Ireland Point; and
- (b) on the West, by the meridian of 64 degrees 50 minutes West; and
- (c) on the North, by the northern limit of the reefs of Bermuda; and
- (d) on the East, by the meridian of 64 degrees 45 minutes west.

South Shore Coral Reef Preserve

All that area bounded by—

- (a) the mean high water mark of the south shore of Bermuda; and
- (b) a straight line drawn between the most southerly extremity of the eastern arm of Hungry Bay and the most southerly extremity of Gurnet Rock; and
- (c) a straight line drawn from the most southerly extremity of Gurnet Rock and the most southerly extremity of Castle Island, and extended to the south shore

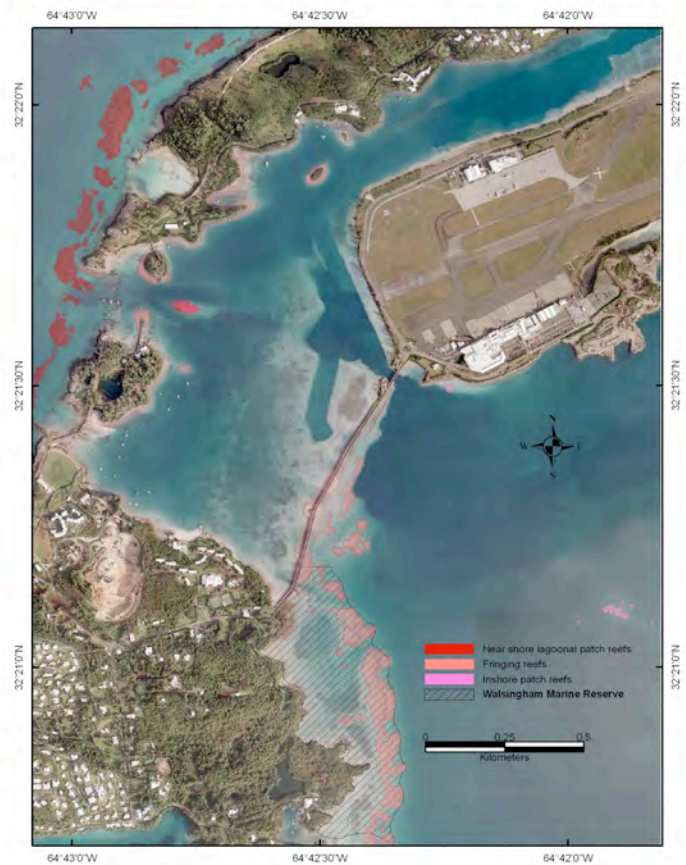
29 Fisheries Protected Areas/MPAs

- 1 "Cristobal Colon" located 32° 29.1'N, 64° 42.5'W- the area within 300 metres radius of a mooring buoy at the wreck of the "Cristobal Colon";
- 2 "North East Breaker" located 32° 29.0'N, 64°42.5'W - the area within 300 metres radius of the North East Breaker beacon;
- 3 "Taunton" located 32° 29.5'N, 64° 41.5'W - the area within 300 metres radius of a mooring buoyat the wreck of the "Taunton";

- 4 "Aristo" located 32° 28.5'N, 64° 39.4'W - the area within a 300 metres radius of a mooring buoy at the wreck of the "Aristo";
- 5 "Mills Breaker" located 32° 24.6'N, 64° 37.8'W -the area within 300 metres radius of Mills Breaker beacon;
- 6 "Pelinaion" & "Rita Zovetto" located 32° 21.3'N,64° 38.4'W - the area within 500 metres radius of a mooring buoy at the wrecks of the vessels "Pelinaion" and "Rita Zovetto";
- 7 "The Cathedral" located 32° 19.6'N, 64° 39.4'W -the area within 300 metres radius of the mooring buoy at the site known as the Cathedral;
- 8 "Kate" located 32° 19.4'N, 64° 41.7'W - the area within 300 metres radius of a mooring buoy at the wreck of the vessel "Kate";
- 9 "Tarpon Hole" located 32° 16.2'N, 64° 46.6'W -the area within 300 metres radius of a mooring buoy at the site known as Tarpon Hole;
- 10 "Hermes" & "Minnie Breslauer" located 32°14.4'N, 64° 47.4'W - the area within 500 metres radius of the mooring buoy at the wrecks of the vessels "Hermes" and "Minnie Breslauer";
- 11 "Marie Celeste" located 32° 14.5'N, 64° 49.9'W -the area within 300 metres radius of a mooring buoy at the wreck of the "Marie Celeste";
- 12 "South West Breaker Area" located 32° 13.8'N,64° 51.8'W - the area within 600 metres radius of a mooring buoy at South West Breaker;
- 13 "North Carolina" located 32° 15.6'N, 64° 57.5'W- the area within 300 metres radius of a mooring buoy at the wreck of the "North Carolina";
- 14 "Airplane" located 32° 15.2'N, 64° 58.6'W - the area within 300 metres radius of a mooring buoy at the wreck of the airplane;
- 15 "Blanche King" located 32° 16.3'N, 64 58.5'W -the area within 300 metres radius of a mooring buoy at the wreck of the "Blanche King";
- 16 "Darlington" located 32° 17.2'N, 64° 59.0'W -the area within 300 metres radius of a mooring buoy at the wreck of the "Darlington";
- 17 "L'Herminie" located 32° 19.1'N, 64° 58.5'W -the area within 300 metres radius of a mooring buoy at the wreck of the "L'Herminie";
- 18 "Vixen" located 300 metres west of Daniel's Head, Sandys - the area within a 100 metres radius of the wreck "Vixen";
- 19 "Commissioner's Point Area" being the area within a 200 metres radius of a stake located at 32° 19.72N, 64° 49.93W and bounded on the outh-west and south-east by the shore;
- 20 "Lartington" located 32° 21.8'N, 64° 54.8'W -the area within 300 metres radius of a mooring buoy at the wreck of the "Lartington";
- 21 "Constellation Area" located 32° 21.8'N, 64°54.8'W - the area within 500 metres radius of a mooring buoy at the wreck of the "Constellation";
- 22 "Montana" located 32° 21.7'N, 64° 54.8'W - the area within 300 metres radius of a mooring buoy at the wreck of the "Montana";
- 23 "Eastern Blue Cut" located 32° 23.4'N, 64°53.1'W - the area within 600 metres radius of a mooring buoy at Eastern Blue Cut;
- 24 "Xing Da Area" being that area within a 200 metre radius of a mooring buoy located at 32° 25.027' N, 64°54.375' W at the wreck of the vessel "Xing Da";
- 25 "Snake Pit" located 32° 26.5'N, 64° 50.3'W - the area within 300 metres radius of a mooring buoy at the area called Snake Pit;
- 26 "Hog Breaker" located 32° 27.5'N, 64° 49.8'W -the area within 300 metres radius of a mooring buoy at Hog Breaker;
- 27 "Caraquet" located 32° 27.7'N, 64° 50.1'W - the area within a 300 metres radius of a mooring buoy at the wreck of the "Caraquet";
- 28 "Madiana" located at 32° 27.5'N, 64° 48.5'W -the area within 300 metres radius of a mooring buoy at the wreck of the "Madiana";
- 29 "North Rock" located at 32° 28.5'N 64° 46.1'W -the area within 1,000 metre radius of the North Rock beacon.



Walsingham Marine Park



Aerial photomosaic (2003 image) of Grotto Bay, Ferry Reach and the Walsingham Marine Reserve showing inshore and nearshore reefs.

Seasonally protected Fisheries areas to the southwest and north east of the island

on 1 May and ending on 31 August in any year collecting is prohibited in any of the following areas:

- (a) "South Western Area" being the area enclosed: on the Northern margin by a line originating at Gibbs Hill Light, running on a bearing of 276 degrees true to the 200 metre contour; (Gibbs Hill Light in line with the tripod at the southern end of the Western Boat Channel); on the South Eastern margin by a line originating at Gibbs Hill Light and running on a bearing of 235 degrees true to the 200 metre contour (Gibbs Hill Light in line with South West Breaker); and, on the Seaward margin by the 200 metre contour;
- (b) "Eastern Area" being the area enclosed: on the Northwest margin by a line originating at St. David's Light and running on a bearing of 036 degrees true to the 200 metre contour; on the Southeast margin by a line originating at St. David's Light and running on a bearing of 065 degrees true to the 200 metre contour: and, on the Seaward margin by the 200 metre contour; and
- (c) "North Eastern Area" being roughly rectangular in shape, is the area enclosed: from the Northern Point (32 degrees 31.7 minutes North, 64 degrees 39.3 minutes West) by a line running in a south-westerly direction to the Western Point (32 degrees 30.8minutes North, 64 degrees 40.4 minutes West) thence by a line running in a south-easterly direction to the Southern Point (32 degrees 25.8 minutes North, 64 degrees 34.1 minutes West) thence by a line running in a north-easterly direction to the Eastern Point (32 degrees 26.2 minutes North, 64 degrees 33.0 minutes West): and on the Seaward margin by the 200 metre contour."

Schedule 6 – Limited Impact Research approved collecting equipment

Approved:

- Scissors/snips;
- Hammer and chisel;
- Hook and line (hand held or rod and reel);
- Dip net;
- Non-fixed plankton net;
- Natural fish anaesthetic - Clove oil emulsified in water;
- Temporary surface marker buoys;
- Pole spear – if used at sites more than 1 mile from the shore without the aid of SCUBA (using a pole spear close to shore and/or using SCUBA requires a permit);
- Cast net (outside of enclosed bays as listed in Schedule 4);
- Bait net less than 9' in depth and 75' long (outside of enclosed bays as listed in Schedule 4);
- Hand operated sediment sampling devices e.g. hand corers, hand grabs;
- Non-fixed water sampling devices.

Restricted (permit required if restrictions cannot be adhered to):

- Pole spear – not permitted within 1 mile of shore or with the aid of SCUBA;
- Cast net no larger than 8' diameter – not permitted in enclosed bays as listed in Schedule 2;
- SCUBA may be used as an aid in most collecting activities but may not be used to take fish;
- Light traps set at dusk and removed at dawn, located outside of high traffic areas.

Prohibited (permit required):

- Fish poisons and chemical anaesthetics – rotenone, MS222, tricaine, eugenol etc;
- Natural fish anaesthetic - Clove oil emulsified in ethanol or acetone;
- Bleach;
- Any chemicals or solutions other than those specifically listed as approved;
- Fixed fishing gear of any type (e.g. pots, traps, fyke nets, other fixed nets etc.);
- Longlines with more than 15 hooks;
- Spearguns of any type, whether powered by tension or compressed air or explosive;
- Explosives.

Schedule 7 - Copy of a filled in ‘VISITING GROUP/VISITING RESEARCHER/BIOS RESIDENT SCIENTIST PLANNED AND REALIZED Collection and Experimental Manipulation Form. NOTE: You will need to fill in an electronic version of this form which can be obtained from the BIOS: leocadio@asu.edu

BIOS – Internal Collection and Experimental Protocols and Policy

BIOS ‘PLANNED’ or ‘REALIZED’ Collection and Experimental Manipulation Form¹

This is a READ-ONLY file, - please fill in the required information and save as **Visiting Group Name and Month and Year** (i.e. Southampton University - May 2007) or **Visiting Researcher Name and Month and Year** (i.e. John Doe - May 2007) or **BIOS Scientist Name and Year** (i.e. Doe - 2007). Please complete if any collecting or experimental manipulation is planned in your program, and forward an electronic copy to BIOS: leocadio@asu.edu prior to your arrival. On completing your stay, please convert the *Planned* collection form (see below) into a *Realized* collection form by updating numbers, dates, locations etc and tickin the appropriate box.. Then please resubmit the form to the BIOS Laboratory manager and your original *Planned* collection form will be replaced with the *Realized* collection form - and this will be kept at BIOS for possible inspection by Government and for internal book-keeping records. For BIOS resident scientist (and their students and interns), the form should be submitted yearly (December) to the BIOS Laboratory manager. *Use a separate line for each planned collection occasion. Examples of completed forms are given below.*

| | | | |
|--|--------|---------|---|
| Name: | Title: | e-mail: | Tel: |
| Professional Affiliation and address, including City/State/Province/Post Code/Country: | | | Date of Visit From / / to / / |
| Visiting Group: <input type="checkbox"/> Visiting Scientist: <input type="checkbox"/> Resident scientist: <input type="checkbox"/> BIOS-taught course: <input type="checkbox"/> Student on a visiting group or BIOS-Taught course: <input type="checkbox"/> Overseas researcher request collection: <input type="checkbox"/> | | | |
| I am familiar with the BIOS <i>Collecting and Experimental Ethics Policy</i> and of the concepts of <i>Limited Impact Research (LIR)</i> : | | | Yes <input type="checkbox"/> No <input type="checkbox"/> (tick box) |
| I am aware that export of any collected material may require a Bermuda Government granted export licence and/or CITES permit: | | | Yes <input type="checkbox"/> No <input type="checkbox"/> (tick box) |
| Do you have any commercial interest in the collection and export of these samples either by yourself or external parties: | | | Yes <input type="checkbox"/> No <input type="checkbox"/> (tick box) |
| Is this Collection and Experimental Manipulation form a <i>Planned</i> (P) or <i>Realized</i> (R) form: | | | P <input type="checkbox"/> R <input type="checkbox"/> (tick box) |

| Mon./Year ² or D/M/Y | Species (and common name) (LIST all species on a separate line) | (a) Site(s); (b) GPS point; (c) Depth (m). | Size or volume | No. | Fate of sample (use terms such as ‘sacrificed’ or ‘returned alive’) or ‘not collected’ |
|---------------------------------|---|--|----------------|-----|--|
| / / | | | | | |
| / / | | | | | |
| / / | | | | | |

¹These forms are the main mechanism whereby BIOS can screen ALL potential collecting activities and ensure internal and external rules and regulations are adhered to. If you expect to collect or conduct manipulative work in Bermuda, you will need to fill out the form *prior* to your arrival and before any collection is undertaken.

² Enter the month of stay for ‘Planned’ collections (i.e. October) and the exact date (i.e. 1/10/2007) for items eventually collected;

Schedule 8 – Levels of Experimental Interference

For ethics purposes, complex organisms are deemed to include all vertebrates (mammals, birds, reptiles, amphibians and fish), as well as higher invertebrates from the class Cephalopoda (cuttlefishes, squids, octopuses) and the orders Stomatopoda and Decapoda of the class Malacostraca (shrimps, crabs and lobsters of various families). For the purposes of euthanasia, complex marine organisms includes fishes, cephalopods, stomatopods and decapods. Other marine vertebrates should be treated as would their terrestrial counterparts.

These procedure categories are intended to give some indication of the impact to which the animal is subjected. This is ONLY a guide and does not exclude otherwise unlisted procedures judged to have a similar level of impact. Project proposals including multiple procedures will be judged based on the highest impact procedure involved.

| Level | Description | Examples |
|-------|--|---|
| 1 | Observational studies involving minor interference Animals are not interacted with or, where there is interaction, it would not be expected to compromise the animal's welfare any more than normal handling feeding etc. There is no pain or suffering involved | Observational study only such as photographing whales at close quarters; Breeding or reproductive study with no detriment to the animal; Behavioural study with minor environmental manipulation |
| 2 | Animal unconscious without recovery Animal is rendered unconscious under controlled circumstances (i.e. not in a field situation) with as little pain or distress as possible. Capture methods are not required. Any pain is minor and brief and does not require analgesia. Procedures are carried out on the unconscious animal that is then killed without regaining consciousness | No experimentation on living animals eg animals killed painlessly for dissection, biochemical analysis, in vitro cell culture, tissue or organ studies; Teaching surgical techniques on live, anaesthetised animals which are not allowed to recover following the procedure |
| 3 | Minor conscious intervention without anaesthesia Animal is subjected to minor procedures that would normally not require anaesthesia or analgesia. Any pain is minor and analgesia usually unnecessary, although some distress may occur as a result of trapping or handling | Injections, blood sampling in conscious animals; Minor dietary or environmental deprivation or manipulation, such as feeding nutrient-deficient diets for short periods; Trapping and release as used in species impact studies; Trapping and humane euthanasia for collection of specimens |
| 4 | Minor operative procedures with recovery Animal may be rendered unconscious with as little pain or distress as possible. A minor procedure such as cannulation or skin biopsy is carried out and the animal allowed to recover. Depending on the procedure, pain may be minor or moderate and post-operative analgesia may be appropriate. Field capture using chemical restraint methods is also included here | Biopsies Cannulations Sedation/anaesthesia for relocation, examination or injections/blood sampling |
| 5 | Surgery with recovery Animal may be rendered unconscious with as little pain or distress as possible. A major procedure such as abdominal or orthopaedic surgery is carried out and the animal allowed to recover. Postoperative pain is usually considerable and at a level requiring analgesia. | Orthopaedic surgery Abdominal or thoracic surgery |

| | | |
|---|---|--|
| 6 | <p>Minor physiological challenge Animal remains conscious for some or all of the procedure. There is interference with the animal's physiological or psychological processes. The challenge may cause only a small degree of pain/distress or any pain/distress is quickly and effectively alleviated.</p> | <p>Minor infection, minor or moderate phenotypic modification, early oncogenesis Polyclonal antibody production Antiserum production</p> |
| 7 | <p>Major physiological challenge Animal remains conscious for some or all of the procedure. There is interference with the animal's physiological or psychological processes. The challenge causes a moderate or large degree of pain/distress that is not quickly or effectively alleviated.</p> | <p>Major infection, major phenotypic modification, oncogenesis with pain alleviation Isolation or environmental deprivation for extended periods Monoclonal antibody raising in mice</p> |
| 8 | <p>Death as an endpoint</p> <p>This category only applies in those rare cases where the death of the animal is a planned part of the procedure. Restrictions will be placed on lethality studies such as LD₅₀ tests or similar. (Where predictive signs of death have been determined and euthanasia is carried out before significant suffering category 6 or 7 applies.) Death as an end point does not include: death by natural causes; animals which are euthanized on completion of the project; animals which are killed if something goes wrong; animals killed for dissection or for use as museum voucher specimens; or accidental deaths.</p> | <p>Lethality testing (LD₅₀, LC₅₀) Toxicity testing with death as a planned end occurs, point without euthanasia</p> |

Adapted from DPI & F Protocol AE P4

<http://www.dpi.qld.gov.au/extra/word/aniamlwelfare/protocolaep4.doc>

Schedule 9 - BIOS internal request form to export material

NOTE: You will need to fill in an electronic version of this form which can be obtained from BIOS: leocadio.asu.edu

BIOS Internal request form to *import, collect* and/or *export* material



Bermuda Institute of Ocean Sciences (BIOS)
 17 Biological Lane, St George's, Bermuda GE01
 Tel: 441-297 1880
 Fax: 441-297 8143
 Web: www.bios.edu

| BIOS internal request form to IMPORT, COLLECT and/or EXPORT materials | | | |
|--|--|--|--|
| Name: | | Student: | Yes <input type="checkbox"/> NO <input type="checkbox"/> |
| Title: | | Supervisor: | |
| E-Mail Address: | | E-mail | |
| Professional Affiliation | | | |
| Address (line 1) | | | |
| Address (line 2) | | BIOS contact if applicable: | |
| City | | Name: | |
| State/Post Code | | E-mail: | |
| Phone/Extension: | | Phone/Ext: | |
| Time schedule | | | |
| Requesting an: Import Permit : Yes <input type="checkbox"/> NO <input type="checkbox"/> Collecting permit : Yes <input type="checkbox"/> NO <input type="checkbox"/> Export permit : Yes <input type="checkbox"/> NO <input type="checkbox"/> | | | |
| Requested IMPORTING DATE date :(day/month/year) | / | / | i.e. (01/January/2007) |
| Requested COLLECTING date :(day/month/year) | / | / | i.e. (01/January/2007) |
| Requested EXPORTING date :(day/month/year) | / | / | i.e. (01/January/2007) |
| Enquiry Information | | | |
| Common name: | | i.e. Hard coral, Brain coral, seagrass | |
| Species name | | i.e. <i>Diploria strigosa</i> | |
| Collection location: | | i.e. NE Breakers | |
| Unit: | | i.e. blade, branch, kg, litre | |
| Quantity: | | i.e. 5 | |
| Size: | | i.e. 10 cm long x 5 cm wide | |
| CITES permit required? | Yes <input type="checkbox"/> NO <input type="checkbox"/> | | |
| Method of Export: | | i.e. air freight, personal | |
| Enquiry Information – continued | | | |
| Common name: | | i.e. Hard coral, Brain coral, seagrass | |
| Species name | | i.e. <i>Diploria strigosa</i> | |
| Collection location: | | i.e. NE Breakers | |
| Unit: | | i.e. blade, branch, kg, litre | |
| Quantity: | | i.e. 5 | |
| Size: | | i.e. 10 cm long x 5 cm wide | |
| CITES permit required? | Yes <input type="checkbox"/> NO <input type="checkbox"/> | | |
| Method of Export: | | i.e. air freight, personal | |
| Enquiry Information – continued | | | |
| Common name: | | i.e. Hard coral, Brain coral, seagrass | |
| Species name | | i.e. <i>Diploria strigosa</i> | |
| Collection location: | | i.e. NE Breakers | |
| Unit: | | i.e. blade, branch, kg, litre | |
| Quantity: | | i.e. 5 | |
| Size: | | i.e. 10 cm long x 5 cm wide | |
| CITES permit required? | Yes <input type="checkbox"/> NO <input type="checkbox"/> | | |
| Method of Export: | | i.e. air freight, personal | |

BIOS Internal request form to export material 23 April 2013

BIOS Internal request form to *import, collect* and/or *export* material

| | |
|--|-----------------|
| Reasons for Import | |
| <p>If applicable, within the space below, provide information describing why an import permit is required i.e. why these organisms need to be imported (pure strain, not available locally or too complex to isolate them from local waters, etc.). Where they come from (culture lab, no extraneous material). Background on each (i.e. non-toxic, whether it is naturally present in Bermuda or not, any history as a known invasive species). A statement regarding the containment of the organisms, and how they will be disposed of, to ensure that they do not end up in the wider Bermuda environment. Please also provide a brief summary of the research (what is being examined or tested, why this is important, and what knowledge that will be gained from use of this material etc). Please name all collaborators and their institutions/organizations that may use this material. Note: you may also be required to also supply this information on your institution's letterhead (3-4 paragraphs max).</p> | |
| Reasons for Collection and/or Export | |
| <p>Within the space below, provide information describing why a collecting and/or export permit is required, i.e. what is being examined or tested, why this is important, and what knowledge that will be gained from use of this material etc. Also include how you are going to collect the specimens (for example with fixed nets using SCUBA etc). Please name all collaborators and their institutions/organizations that may use this material. Note: you may also be required to also supply this information on your institution's letterhead (3-4 paragraphs max)</p> | |
| <p>DISCLAIMER By submitting this request, I agree that I will abide by all laws/regulations for collecting biological specimens in and around Bermuda. I also agree that I will:(a) use the specimens and their derivatives (e.g., progeny or DNA clones) only for the applications outlined above . If a new application is to be undertaken after samples have been exported, this application must be approved in writing by the Bermuda Government Department of Environmental Protection; b) not use the specimens or their derivatives for any commercial interest without explicit sanction of the Bermuda Government Department of Environmental Protection, under the terms the Government deems appropriate; (c) not provide the specimens or their derivatives to third parties; (d) store and dispose of the specimens and their derivatives in a safe and secure manner</p> | |
| Agree <input type="checkbox"/> Disagree <input type="checkbox"/> | Applicant Name: |

Fill in this form including the disclaimer and send an electronic copy to bruce.williams@bios.edu. NOTE: This is a READ-ONLY document. After completing it, save it as your surname + space+ month + year i.e. save as 'Williams May 2007'.

BIOS Internal request form to export material

23 April 2013

Schedule 10 – Applying for a CITES permit

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Exports with CITES permits must be inspected by the CITES officer at the Ministry of the Environment, Department of Environmental Protection (DEP) offices in the Botanical Gardens in Paget (near Hamilton), at which time the permit will be validated, and then the items must be shipped *on the same day as validation*⁴

The person requesting the export permit should contact the CITES officer at the Ministry of the Environment, Department of Environmental Protection (DEP) to arrange for the CITES inspection. The officer is currently Dr. Jonathan Nisbett (The Government Veterinary Officer).

Department of Environmental Protection
Botanical Gardens
169 South Road Paget,
Bermuda DV-04
Telephone: 441-236-4201
Fax: 441-236-7582

You will need to send (fax) your 'Export Permit' previously issued by the Department of Environmental Protection which contains all relevant details in order for the CITES permit to be filled in, and then take the samples to the DEP for inspection and to be issued the CITES permit.

The shipment must also be inspected at the point of entry into the destination country. If sending via courier⁵, this should be noted in the special instructions on the airway bill as follows: 'Contains samples of species controlled by CITES – must be inspected by USFWS officer on entry to U.S. or DEFRA officer on entry to UK'.

If samples are being carried by an airline passenger then arrangements must be made for a representative of the appropriate authority to be present at the port of entry to carry out the inspection. For travel to the US, customs and import inspections are carried out at the L.F. Wade International Airport (the Bermuda civil air terminal on exiting the island) – this is considered the point of entry to the US. There is a US Department of Agriculture Officer at the inspection point for all scheduled flights⁶.

For further information or to notify them about a shipment, contact: - U.S. Department of Agriculture, 2 Cahow Way, Tel: 293 8127, US Customs and Border Protection: Telephone: 293 0467⁷

Although Appendix I species require an import permit for the destination country, Appendix II species do not require one unless specifically required under the national laws of the importing country. The US does not require import permits for corals. The UK does not appear to have any specific requirement for this either.

⁴ In addition, because of the flight schedules, it is often not possible to get the local inspection / permit validation on the same day if traveling on an early flight. The local officers understand this and have agreed that an inspection/validation within the past 24 hours (e.g. from the previous afternoon) is fine.

⁵ The Federal Express office on Serpentine Road in Hamilton receives packages up to 6pm for shipping on the late flight the same night. For live specimens, delivery to the office later in the day may be better than having them collected here in the middle of the day and sitting around in the container for longer than necessary)

⁶ Although it is not strictly necessary to call ahead to the US Department of Agriculture Officer at the airport, it may speed things up to call their office and leave a message on the answering machine for them to expect passenger X on flight Y with CITES controlled samples of Z.

⁷ Telephone number valid as of 19 October 2007

For questions regarding export to the US contact

US Fish and Wildlife Service
Division of Management Authority
4401 N. Fairfax Drive, Room 700
ARLINGTON, VA 22203-3247
+1 (800) toll-free within the United States; otherwise
+1 (703) 358 21 04
Fax: Office of Chief, DMA: +1 (703) 358 22 80
Branch of CITES Operations: +1 (703) 358 22 98
Branch of Permits: +1 (703) 358 22 81
Email: managementauthority@fws.gov
Web: <http://international.fws.gov>

For questions regarding export to the UK contact:

Department for Environment, Food and Rural
Affairs (DEFRA)
Global Wildlife Division
1st Floor, Temple Quay House
2 The Square
Temple Quay
BRISTOL BS1 6EB
Tel: +44 (117) 372 80 17
Fax: +44 (117) 372 82 06
Email: cites.ukma@defra.gsi.gov.uk
Web: <http://www.ukcites.gov.uk>

Schedule 11 – Short CEEP Alert poster



BIOS COLLECTION and EXPERIMENTAL ETHICS POLICY

The Bermuda Institute of Ocean Sciences (BIOS) has a deep respect for the natural environment of Bermuda and is dedicated to its preservation. BIOS does not sanction collecting, export, or experimental studies for any purpose other than research or education (i.e., recreational collection is not permitted). Collection for commercial purposes is expressly prohibited without permission from the Bermuda Government.

All visitors and BIOS staff are expected to be familiar with and abide by the BIOS *Collection and Experimental Ethics Policy*

Copies of CEEP are available at Reception for visitors. Copies are available to staff at:
biosfs01\Department_Data\Public\Lab Ops\Collecting Policy and Protocols

If you have any questions, please contact Leocadio Blanco-Bercial (leocadio@asu.edu).

Note, this policy does NOT apply to:
Water samples
Air/atmospheric samples