

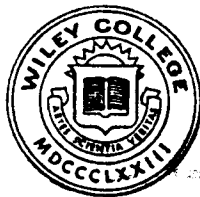
WILEY COLLEGE

MARSHALL, TEXAS 75670

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FEB 5 1975

PADRE ISLAND
NATIONAL SEASHORE



Baseline Ecological
Study of Mammals on
Padre Is. ~~Marshall, Texas~~

January 31, 1974

Robert G. Whistler
Chief Park Naturalist
Padre Island National Seashore
10235 South Padre Island Drive
Corpus Christi, Texas 78418

Dear Bob:

Enclosed please find three copies of the Investigator's Annual Report. Please read through the various statements, and if there are any questions I will attempt to expand on the information. One area of concern for me is financial support. The old grant which I used for funds last year has expired. I have a new proposal in, but you never know about the funding.

As I mentioned to you in Santa Fe, I think the Padre study could be of significance from a mammal standpoint in view of the building race and reduction of land with native environments. Let me list some of the information from my work that you may want to add to your notes:

1. On July 29, at 7:30 P.M. I observed an adult badger in excellent physical condition cross the pavement approximately 100 yards south of the seashore entrance.
2. On June 20, 22, 25 and July 26 and 27 I observed blacktail Jackrabbits out on the beach just after sunrise.
3. There was a large number of snakes of various species present during the summer.

I plan to be in your area in March. Thank you for your assistance in this research project.

Sincerely yours,

John T. Baccus
John T. Baccus

JTB/wbj



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APR 22 1974

PADRE ISLAND
NATIONAL SEASHORE

WILEY COLLEGE

MARSHALL, TEXAS 75670



April 19, 1974

John Turney, Superintendent
Padre Island National Seashore
Box 8560
Corpus Christi, Texas 78412

RECEIVED PADRE ISLAND NATIONAL SEASHORE	
☒ Superintendent	
☒ Adm. Officer	
☒ Chief, I & RM	
☒ Park Naturalist	
☐ Secretary	
☐ Chief of Maint.	
☐ B & U	
☐ R & T	
☐ LM District	
☐ GC District	
☐ Supply Assistant	
☐ Receptionist	
☐ Admin. Secy.	
☒ Files	N-321427

Dear Superintendent Turney:

I was informed recently by Bo Wauer that you had been appointed to head Padre Island Seashore. I applied and visited with Jim McLaughlin about a baseline ecological study using the small mammals as community indicators. Jim had some questions about my proposal, and the matter has been hanging for about a year.

Since last corresponding with Jim, I have been contacted by Patrick Parker at the Marine Institute about the project, and its relation to their study at Padre Island. I have decided to coordinate my proposal project with the people at the institute. I believe that by doing this the greatest amount of useful data will be gathered.

Let me comment on Jim's letter of the 5th of July 1973. I will not trap or collect marine mammals. I intend to pursue only objective one in my proposal. I will not collect large numbers of mammals for specimens. A series of 15 should be sufficient. Progress reports will be submitted.

I plan to begin work with the Marine Institute in early June. If you have additional questions concerning my phase of the study, please feel free to contact me. I await further correspondence with you and approval by you of my project.

Sincerely yours,

John Baccus

John T. Baccus, Chairman
Department of Biology



Padre Island National Seashore
P. O. Box 8560
Corpus Christi, Texas 78412

N1427

July 5, 1973

Dr. John Baccus, Chairman
Department of Biology
Wiley College
Marshall, Texas 75670

Dear Dr. Baccus:

I have read with interest your proposal for a mammal research project to be conducted here at the National Seashore. There were comments and questions raised in my mind, however, in regard to the proposal. First I must say that it is not possible to have available for your use a boat for the spoil bank study. With our limited manpower and resources, it is imperative that we concentrate on visitor needs first.

The objectives listed are rather comprehensive and need much more clarification.

I gather due to the extent of your study and objectives that more in the way of staff than yourself are involved. It would be necessary to know who these other people are and particulars concerning their professional background.

The first objective you proposed defines the "mammal fauna of the National Seashore and its surrounding waters." Do you intend to trap any marine mammals? These animals are now protected by law under the Ocean Mammal Protection Act of 1972. You made no further mention or indication of work in this regard.

It is indicated that a series of 30 specimens would be collected over the duration of study for each species. This figure for the collection seems too high and not realistic from our standpoint. This figure should be further considered rather carefully.

There is no mention of reports. It would be necessary to have quarterly progress reports of work completed and plans for the next quarter submitted to this office.

I recommend that you consider the above points and further define each objective in a proposal revision. We await your reply.

Sincerely,

James L. McLaughlin
Superintendent

RGWhistler:jaa

- 2) Expansion of plot size.
- 3) Random sampling over the extent of the seashore.
- 4) Establishment of ten mile transects
- 5) Correlation of rodent distribution with vegetative units, including c^{13} studies.

The present plan of operation should meet the stated objectives outlined in the proposal. There should be no major change in methods.

Financial support for the 1975 year was provided through a grant to Wiley College by the National Science Foundation (GY 10486). This grant has expired. The principal investigator has submitted a proposal for additional funding by the National Science Foundation. This proposal for approximately \$22,000.00 includes funds for the Padre Island study. If this proposal is not funded, then no funds would be available to continue the current project. If this occurs then a grant from the National Park Service would be necessary for the continuation of the project. It is estimated that \$5,000.00 would be sufficient for continuance of the research.

Padre Island National Seashore
P. O. Box 8560
Corpus Christi, Texas 78412

N1427

July 5, 1973

Dr. John Baccus, Chairman
Department of Biology
Wiley College
Marshall, Texas 75670

Dear Dr. Baccus:

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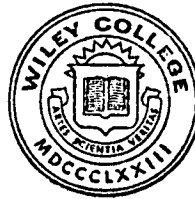
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Sincerely,

James L. McLaughlin
Superintendent

RGWhistler:jaa

PADRE ISLAND NATIONAL SEASHORE		WILEY COLLEGE
✓ Superintendent		MARSHALL, TEXAS 75670
✓ Adm. Officer		
Chief, I & RM		
✓ Park Naturalist	W	
✓ Secretary		
DIVISION OF NATURAL SCIENCE AND MATHEMATICS		
B & U		
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GC District		
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June 6, 1973

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JUN 14 1973

PADRE ISLAND
NATIONAL SEASHORE

James L. McLaughlin, Superintendent
Padre Island National Seashore
10235 South Padre Island Drive
Corpus Christi, Texas 78412

Dear Superintendent McLaughlin:

I apologize for the lengthy delay in the submission of a proposal to conduct mammalian research at Padre Island. I assure you the delay in no way reflects my interest in the study we previously discussed.

In the proposal I have outlined a course of research that should produce baseline ecological data. An ecological framework for future studies on Padre Island will be available. Using this data, hurricane or human impact studies can be pursued or mammal investigations continued as the vegetation changes.

I also want to engage in studies of succession on the spoil bank islands. One area of interest is the use of these islands as a temporary habitat for dispersing mainland forms. I hope your boat will be available to assist us in this phase of the study.

I request your permission to initiate a mammal study at Padre Island National Seashore and the extension to me of a collaboratorship for such a study. I assure you that I will abide by the rules and regulations of the National Park Service and consult with you and your staff concerning all phases of the study.

This project will be funded through a grant from the National Science Foundation. I will try to obtain lodging at Welder. I hope, if approved, to initiate the study in July.

Should there be any questions concerning the proposal or methods to be used, please contact me for clarification.

Yours very truly,

John Baccus
John T. Baccus, Chairman
Department of Biology



JTB/sl
Enclosure

UNITED STATES GOVERNMENT

Memorandum

TO : Superintendent

DATE: March 6, 1974

FROM : Chief Park Naturalist

SUBJECT: Questions dealing with the mammal phase of the park carrying capacity study

As you recall we have discussed this situation verbally recently. I have put to writing various considerations that we might look into and have an understanding with Dr. Baccus upon initiation of this study.

First, it is understood by all that there is no taking of collection of any marine mammal.

Second, catch and release of animals is certainly all right and would fit in with an ecological understanding that his study is dealing with. Trapping and museum preparation of study skins is something else. Even though he has a collaboratorship I believe that a understanding between all on this should be cleared. That is, only a few specimens at the very most should be collected - not any number or designation that one might want. Definite lines of study or investigation should be elaborated here on the researchers part. He states in his proposal, "it will be necessary to collect a series of representative specimens for each species. A series of 30 specimens collected over the duration of the study should be sufficient". What does he mean here? What is a representative number of specimens for each species? (Not 30) Where are mist nets going to be placed? How many bats are to be collected?

Third, inform us as to the location of line transects so that there will not be any unknown disruption or activity that might take place that we could counteract. The 10 mile stakes don't seem to be a satisfactory indicator here, many are missing, etc.

Fourth, how is the determination of the visitors on the mammalian population going to be determined as tied into the carrying capacity study?

Fifth, the spoil bank study will involve some kind of transportation, does he have this worked out? He indicated that he would like for us to provide a boat but we wrote back that this was not possible.

Sixth, his study represents a sensitive area in the eyes of various groups and it is imperative that he attempt to understand this. We have to answer to these people and also keep a NPS image and a professional image.

B. Baccus





RECEIVED DIRECTOR

PADRE ISLAND NATIONAL PARK SERVICE
NATIONAL SEASHORE

SOUTHWEST REGION

P.O. Box 728

Santa Fe, New Mexico 87501

RECEIVED

JUL 2 1973

PADRE ISLAND
NATIONAL SEASHORE

JUN 29 1973

IN REPLY REFER TO:

N1427-PSN

Superintendent	
Adm. Officer	
PSN, I & RM	
Park Naturalist	
Secretary	
Chief of Maint.	
B & U	
R & T	
IM District	
GC District	
Supply Assistant	
Director	
Asst. Dir.	
Files	

Dr. Ross L. Shipman
Division of Natural Resources and Environment
University of Texas
University Station, Box X
Austin, Texas 78712

Dear Ross:

Enclosed is a proposal from Dr. John Baccus, Wiley College, for study of small mammals at Padre Island. I mentioned this study to you in the past, but have just received the proposal. Dr. Baccus is funded by N.S.F. and his proposal is self-explanatory.

Much of what he proposes fits in very nicely with some of the analysis of the Padre Island ecosystem with which you folks will be involved. You may want to meet with Dr. Baccus, or at least develop communications so that his research can be of assistance to your program. I have considerable confidence in Dr. Baccus, and he may be of considerable assistance to you.

Just as soon as we receive word that our 1974 FY monies are reality, I will initiate a contract for Padre Island research as per our previous correspondence and a work program that will be approved by the Southwest Regional Director, Mr. Kowski.

Sincerely,

~~(SIGNED)~~

Roland H. Wauer
Chief, Natural Science

Enclosure

cc:

Superintendent, Padre Island

WILEY COLLEGE

MARSHALL, TEXAS 75670



DIVISION OF NATURAL SCIENCE AND MATHEMATICS

June 6, 1973

Proposal for a Baseline Ecological Study of Mammals on Padre Island National Seashore

Introduction

Padre and Mustang Islands are unique in that they provide an essentially uniform environment extending some 150 miles along the Texas Coast. Padre Island is approximately 110 miles long and extends from Corpus Christi Pass at the northern end to Brazos Santiago Pass at the south. Geologically Padre Island has not been separated from the mainland for a significant period of time.

Padre Island is located in the Tamaulipan biotic province (Dice, 1943). This biotic province is recognized as an area in which diverse faunas and floras meet and intergrade. The Tamaulipan province is important biogeographically because it is situated along the apparent route of invasion of eastern North America by various species of mammals from Mexico (Blair, 1952). The island system along the coasts of Texas and Mexico could be important as a dispersal corridor. Islands of similar ecological composition extend from Padre Island and occur north as far as Galveston Island and south to Altamaria, Tamaulipas, Mexico. The adjacent mainland does not have such a homogenous composition. The ability of mammals to



utilize this dispersal route apparently depends on the age and inter-connection of the offshore islands.

Padre Island has probably not been present long enough, or separated from the mainland by a sufficient barrier (Laguna Madre) for genetic isolation to be a major factor in speciation. Only a limited amount of speciation into subspecies distinct from mainland forms has occurred. Two subspecies on the island, Geomys personatus personatus, and Dipodomys ordii compactus differ from their counterparts on the mainland. Speciation has begun on Padre Island. This fact enhances the unique biological position of the island.

Blair (1952) recorded 62 species of land mammals from the Tam-aulipan biotic province. Raun (undated) reported 18 terrestrial and six marine mammals distributed on Mustang and Padre Islands and adjacent waters. Several of the mammals, Spermophilus spilosoma, Scalopus aquaticus, Geomys personatus, and Dipodomys ordii are ecologically restricted to areas of deep sand. Basically the mammalian fauna of Padre Island is poorly known. Literature references are few, and there is a paucity of specimens in museum collections. I believe it is of vital importance that reference series of Padre Island mammals be made. Generally the mammal fauna of Padre Island appears to be a depauperate mainland fauna.

The sand dune ecosystem is one of the most unstable ecosystems. A dune is never completely stable unless covered with a continuous mat of vegetation. Should this mat be broken for any reason, rapid changes occur in dune structure. The extensive dunes on the banks along the South-Atlantic coast have in recent years become increasingly

active because their cover was broken or reduced by overgrazing and other disturbances by man (Oosting, 1954). Of course any changes at Padre Island would first influence the vegetational patterns, but since mammalian composition is directly linked to vegetation in this unstable ecosystem, a dramatic change in the mammal fauna would coincide with vegetational changes.

Five vegetative types compose the Padre Island flora. These are (1) coastal dunes, (2) low coastal sands, (3) salt marsh, (4) salty sands, and (5) shoregrass flats (Rechenthin and Passey, 1967). No appreciable vegetation exists on salt or mud flats. Evidently some secondary succession is presently initiated in the low coastal sands. This could possibly reach a prairie climax in the future. Possibly a climax has already been attained in the shoregrass flats.

Objectives

The major objective of this study would be correlation of mammalian distribution and abundance with the appropriate vegetative units. Other objectives are:

1. Define the mammal fauna of Padre Island National Seashore and its surrounding waters. *Handwritten: 1. Define the mammal fauna of Padre Island National Seashore and its surrounding waters.*
2. Determine the impact of seashore visitors upon the mammalian fauna. *Handwritten: 2. Determine the impact of seashore visitors upon the mammalian fauna.*
3. Study speciation of resident mammals.
4. Evaluate the dynamics of the rodent populations.
5. Study the invasion and dynamics of spoil banks succession.
6. Establish a baseline to determine the impact of hurricanes on the mammal species.

Methods

This study will be conducted at Padre Island National Seashore. To analyze the mammal species, it will be necessary to collect a series of representative specimens for each species. A series of 30 specimens collected over the duration of the study should be sufficient. Pertinent data--sex, body measurements, reproductive condition, collection site, ecological associates, parasites--will be recorded for each specimen.

To determine the vegetative-mammalian correlation for the baseline study, permanent quadrat plots will be established. The plots will be located in the five different vegetative associations. Each quadrat will have a permanent bench marker and permanent grid stakes. These quadrats will be the primary source of data for the study. The permanent quadrats will allow follow-up studies in the future. The number and location of the permanent quadrats will be selected in consultation with seashore officials.

Mammalian population estimates will utilize the quadrats. The Schnabel removal method as modified by Zippin (1956) will be employed in population estimates. The formula $N = \frac{y^2}{\bar{y}z}$ will yield a statistical analysis of the population density of all mammals or individual species.

General distribution pattern will be obtained by line transects extending from the east side of the island to the west side. These transects will not be permanent but could be duplicated at a later date. The 10 mile posts will be the reference points for the line transects.

Taxonomic studies will include data from skins and skulls in addition to karyological methods, electrophoretic analysis of blood proteins, and other biochemical methods. The systematic status of the mammalian fauna will be delineated.

Spoil bank islands will be examined. Such factors as island size, vegetative coverage, vegetative composition, and species diversity will be analyzed in relation to invasion of these islands by mammals.

Sherman live traps will be used to collect specimens of small mammals. Bat collection will utilize mist nets. Mammals will be prepared as museum mounts and deposited in the Modern Mammal Collection of Wiley College.

The duration of this project is estimated to be three years. Partial financial support will be from a National Science Foundation Grant (GY 10486) to Wiley College. Dr. John T. Baccus of the biology faculty will supervise this investigation.

Literature Cited

- Blair, W. F. 1952. Mammals of the Tamaulipan biotic province in Texas. Tex. J. Sci., 4:230-250.
- Dice, L. R. 1943. The biotic provinces of North America. Univ. Michigan Press, Ann Arbor.
- Oosting, H. J. 1954. Ecological processes and vegetation of the maritime strand in the southeastern United States. Bot. Rev., 20:226-262.
- Rechenthin, C. A. and H. Passey. 1967. The vegetation of Padre Island National Seashore. SCS, Temple, Texas. 17 pp.
- Raun, G. G. An annotated checklist of the mammals of Mustang and Padre Island. Welder Wildlife Foundation, 6 pp.
- Zipkin, C. 1958. The removal method of population estimation. J. Wildlife Management, 22:325-339.