



Republic of the Philippines  
Department of Environment and Natural Resources  
MIMAROPA Region  
Provincial Environment and Natural Resources Office

RECEIVED

29 SEP 2022

INCOMING  
OUTGOING  
DATE NO.

September 22, 2022

## MEMORANDUM

**FOR** : The Regional Executive Director  
MIMAROPA Region

**THRU** : The ARD for Technical Services

**FROM** : The In-charge, PENR Officer  
Oriental Mindoro

**SUBJECT** : **ENDORSEMENT OF DRAFT MEMORANDUM OF AGREEMENT (MOA) BETWEEN DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (DENR) AND MINDORO STATE UNIVERSITY (MINSU) REGARDING THE CONDUCT OF SCIENTIFIC STUDIES IN NAUJAN LAKE NATIONAL PARK (NLNP)**

Forwarded is the request of Mindoro State University (MINSU) for the issuance of Gratuitous Permit for the collection of species and the biodiversity within Naujan Lake National Park (NLNP), for thesis purposes. The said proposal was already presented to the NLNP – Protected Area Management Board (NLNP-PAMB) Executive Meeting on May 26, 2022.

Attached are the letter request, draft of the thesis study, draft MOA and the minutes of the NLNP-PAMB Executive Meeting.

For information and reference.

  
TSD/CHIEF ALMA E. GIBE



DENRPENRO2209000036



September 19, 2022

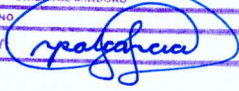
**MEMORANDUM**

**FOR :** The Regional Executive Director

**THRU :** The In-Charge, PENR Officer

**FROM :** The CENR Officer

**SUBJECT :** **ENDORSEMENT OF DRAFT MEMORANDUM OF AGREEMENT (MOA) BETWEEN DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES (DENR) AND MINDORO STATE UNIVERSITY (MINSU) REGARDING THE CONDUCT OF SCIENTIFIC STUDIES IN NAUJAN LAKE NATIONAL PARK (NLNP)**

DENR-MIMAROPA REGION	
PROVINCIAL ENVIRONMENT AND NATURAL RESOURCES OFFICE	
ORIENTAL MINDORO	
PENR TRACKING NO.	
RECEIVED BY	
DATE	SEP 20 2022
TIME	

This pertains to the several request by Mindoro State University for permit to undertake studies of species and biodiversity within Naujan Lake National Park (NLNP). The studies which are mostly thesis, entails collection of specimen species from the lake.

Relative thereto, we are forwarding the draft MOA for review and comment. The MOA serve as the main instrument for the research undertaking agreement and basis for the issuance of corresponding Gratuitous Permit (GP) for the collection of species subject of the research.

Also, attached are letter request for Gratuitous Permit dated May 13, 2022, sample research proposal and minutes of the NLNP-PAMB Executive Committee Meeting last May 26, 2022.

For information, record and consideration.

  
**RODEL M. BOYLES**



**Mindoro State University**  
Victoria, Oriental Mindoro 5205 Philippines

E-mail: mnsctmainop@gmail.com  
Website: www.minscat.edu.ph  
Phone: +63 977 846 72 28

13 May 2022

**RODEL M. BOYLES**  
CENR Officer  
Socorro, Oriental Mindoro

Thru: **RICARDO R. NATIVIDAD**  
PASu  
Naujan Lake National Park

Sir:

Greetings!

One of our students is interested to work on *Barbodes hemictenus*, a local endemic and thus classified as vulnerable. The species has very limited study due to its ecological classification, but as a local learning institution, we want to take steps in understanding its ecology and biology.

Please see, attached, a copy of the proposal by Enrico Duazo entitled Geometric Morphometric Analysis of Paitan (*Barbodes hemictenus*) in Three Tributaries of Naujan Lake. He is set to collect at least 30 individuals by hook-and-line from Gusay, Malbog, and Pasi Creeks for the study. Each collected specimen will be photographed in a scaled background, the photos will be processed for geometric morphometrics. As we are aware of the rarity of the species, specimen will be stored in 75% alcohol to serve as vouchers or may be used for future studies.

In this regard, may we request your endorsement of the same to DENR for the granting of a **Gratuitous Permit**?

Thank you very much.

Respectfully yours,

A handwritten signature in blue ink, appearing to read 'Katherine P. Sanchez-Escalona'.

**KATHERINE P. SANCHEZ-ESCALONA**  
Adviser

**Geometric Morphometric Analysis of Paitan (*Barbodes  
hemictenus*) from Three Tributaries of Naujan Lake**

A Thesis Proposal  
Presented to the Faculty of the  
**MINDORO STATE UNIVERSITY**  
Main Campus  
Alcate, Victoria, Oriental Mindoro

In Partial Fulfilment  
of the Requirements for the Degree  
**BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE**

By  
**ENRICO C. DUAZO**



## **CHAPTER I**

### **Introduction**

#### **Background and Importance of the Study**

The Philippines contains a total area of over 370,000 hectares of freshwater habitats, including lakes, swamps, reservoirs, rivers, ponds, and tiny impoundments. Our freshwater environments are rich resources in terms of both economics and biodiversity. Thousands of fishermen rely on lakes, swamps, and rivers for their food and livelihood. Reservoirs generate more than 40% of the country's electricity through hydroelectric plants, which also offer irrigation to over 1.5 million hectares of farmland. Dams provide the majority of Metro Manila's residential water supply. In 1989, freshwater fisheries from our interior waters supplied 222,257 metric tons, or 11% of the country's total fisheries production (BFAR 1990).

In the Philippine taxonomy there are 43 indigenous freshwater fishes, as well as other aquatic animals and plants (De la Paz, 1988).

Naujan Lake is the Philippines' fifth largest lake located in Oriental Mindoro, but unlike the country's other major lakes, its aquatic biodiversity has received little attention. When compared to Taal Lake and Laguna de Bay, where the immense aquatic diversity, particularly fishes, is now recognized up to genetic level, accounts on its aquatic fauna are confined to merely listing of species. The fact that this lake is not part of the country's major island group might be the cause. The lake is fed by several mountain streams and springs, and it is drained by its lone exit (Butas River), which is roughly 20 kilometers long and connects it to the sea (Tablas Strait). The Butas River provides as a migratory route for migratory species, which many fishermen rely on.

The lake is a wetland ecosystem that supports vulnerable, endangered, or critically endangered species as well as a migratory bird population, and it was designated as the 1008th RAMSAR site worldwide and the Philippines' second RAMSAR site. However, the areas around the lake, which were once covered in a lush forest, were destroyed for various human activities.

Paitan, or *Barbodes hemictenus* as it is scientifically known, was once a dominant species in Naujan

Lake. Only Mindoro Island in the Philippines is home to this species (Labatos, 2016). Because of its limited geographic range, it is classified by IUCN as Vulnerable species. It covers an estimated 8-9 threat-based locales with an extent of occurrence (EOO) of 5,483 km<sup>2</sup> and an area of occupancy (AOO) of 1,376 km<sup>2</sup>. Various threats in Naujan Lake may push this species to extinction (Torres, A.G et al. 2021). The quality of this species' habitat is expected to continue to deteriorate as a result of uncontrolled human migration and population growth, exotic fish introductions, illegal fishing practices, siltation, pollution from agricultural and domestic wastes and garbage, and various land-use conversions. Because this species is becoming increasingly scarce, immediate investigation on its population is important.

Due to scarcity of data about *Barbodes hemictenus* the outcome of this study will be beneficial for future research on this endemic and vulnerable species. The study's findings will lead to an accurate identification of *Barbodes hemictenus* based on shape variation in morphology, which is critical for fishery management and has significant ramifications for biodiversity. It's also a crucial characteristic for studying fish evolution,

particularly spatial variation among populations and hypotheses regarding adaptation to local environmental conditions (Nieves and Monteiro, 2003).

### **Objectives of the Study**

The purpose of this study generally aims to determine the Geometric Morphometrics of Paitan (*Barbodes hemictenus*) in selected tributary of Naujan lake.

Specifically, this aimed to:

1. know and identify through Geometric Morphometrics the Shape Variation of Paitan (*Barbodes hemictenus*) per site:

- 1.1. site 1 (gusay creek)

- 1.2 site 2 (Malbog creek)

- 1.3 site 3 (Pasi creek)

2. know and identify through Geometric Morphometrics the Shape Variation of Paitan (*Barbodes hemictenus*) in three tributaries of Naujan lake in terms of sex:



2.1. Male

2.2 Female

3. know the significant difference of Shape Variation  
of samples per site

### **Hypothesis of the Study**

There is a significant difference in m Shape Variation  
orphometric characters of Paitan (*Barbodes hemictenus*) in  
three different tributary of Naujan Lake.

### **Significance of the Study**

The study will serve as information for the  
conservation of Paitan (*Barbodes hemictenus*) and create  
plans for its natural habitat specially the selected  
tributary (Gusay, Malbog and Pasi Creek) of Naujan Lake.  
Specifically, throughout of the study is expected to be  
beneficial for the following:

**Bureau of Fisheries and Aquatic Resources :** The study will serve as a bases for plans and conservation measures to the said endemic species.

**Local Citizens:** The study would benefit the citizens as important source of food and for them to be able to conserve and to preserve this species.

**Local Government Unit (LGU):** With the information that this study may provide the best strategies for the tributaries specially Gusay, Malbog, and Pasi Creek that may help the preservation of this endemic and vulnerable species

**The Researcher:** The researcher can also gain significance of this study. They would improve their research skills, knowledge and learning how to organize information.

**The Institution:** The study would enable the institution to help students to conduct researches and better understand their published works to have better future.

#### **Limitation and Scope of the Study**

The study will focus only on Paitan (*Barbodes hemictenus*) that exists in selected tributary of Naujan

lake. It will be conducted to determine the Morphological Variation of Paitan (*Barbodes hemictenus*) in selected tributary of Naujan lake.

#### **Time and Place of the Study**

The conducting of study will be in three different tributary of Naujan Lake located in its South-western part, Brgy. Pakyas and Bambanin, Victoria, and Brgy. Pasi I Socorro Oriental Mindoro during dry season from April 2022 - May 2022.

#### **Definition of Terms**

The following definition of terms conceptually and operationally defined.

Population - a community of animals, plants, or humans among whose members interbreeding occurs

Biodiversity - a term used to describe the enormous variety of life on Earth. It can be used more specifically to refer to all of the species in one region or ecosystem.

Exotic - organisms that have been introduced into an area outside their normal distribution. Human individuals or agencies have both intentionally and accidentally

introduced alien species into ecosystems, sometimes with devastating unintended consequences.

Endemism - the state of a species being native to a single defined geographic location, such as an island, state, nation, country or other defined zone; organisms that are indigenous to a place are not endemic to it if they are also found elsewhere.

Fisheries - refer to the occupation, industry, or season for catching fish. It can also refer to the area of ocean where fish are caught, or the business of catching the fish.

Siltation - a process by which water becomes dirty as a result of fine mineral particles in the water. When sediment, or silt, is suspended in water, this is an example of siltation.

Temperature- is measure of coldness or warmth of a substance. It is measure by a thermometer or barometer

Vulnerable species - a species which has been categorized by the International Union for Conservation of Nature that is threatened with extinction unless the circumstances that are threatening its survival and reproduction improve.



## **Chapter II**

### **Review of Related Literature**

#### **Geometric morphometric analysis on Fish**

According to Rohlf and Marcus (1993), Geometric morphometrics is a recently developed approach that explicitly retains information on spatial covariation among landmarks. These landmark-based strategies have no limits on the direction of variation or the localisation of shape changes, and they are particularly effective at gathering useful information about organism shapes. It is feasible to recreate a group consensus shape and the hypothetical shape of a common ancestor using geometric morphometrics, which uses statistically comparable shape variables. Changes and transformations required to identify one shape from another can also be seen. Morphometric approaches are enhanced by multivariate statistical procedures (Rohlf and Marcus 1993; Rohlf et

al. 1996; Cavalcanti et al. 1999; Zelditch et al. 2004) because they allow the statistical characterization of the morphological variation itself. They're also used to see if there's a link between body form and ecological features, or to see how much phylogenetic inertia affects shape similarity. Felsenstein (1985); Rüber and Adams (2001); Rosenberg (2002); Guill et al. (2003) predict closely related species to be more similar than they would be if they didn't share an evolutionary history. To convincingly establish a link between an observed pattern of morphological variation and a theorized process generating adaptive divergence, it is necessary to combine phylogenetic information with geometric morphometric techniques (Coddington 1990; Linde et al. 2004).

A study made by Roldan T. Echem (2016) determined the shape variation of *Sardinella lemuru* through geometric morphometrics. A total of 120 samples were digitized and sexes were determined by direct gonadal examination. Images were processed using geometric thin-plate spline grids (TPS), partial warps (PW) and relative warps (RW) software. The generated relative warp scores were subjected to statistical analysis using the PAST software. Results revealed that the shape variation (90.86%) in the

female was found in the curvature of the body and length area between posterior insertion of the first dorsal fin and posterior most body extremity at RW 1. In the males, shape variation (48.24%) was found in the mid-section of the body at RW 1. The body shape variation of *Sardinella lemuru* can be accounted to their genetics and evolutionary adaption. Over fishing could have contributed to their differentiation. The phenotypic plasticity of *Sardinella lemuru* allows them to respond and adapt to environmental change by modifying their morphology and behaviour which eventually lead to changes in their morphology, reproduction, or survival that alleviate the effects of such environmental change.

Another research by Brian S. Santos and Jonas P. Quilang on 2011 used geometric morphometrics to examine shape variation in the sea catfishes *Arius manillensis* and *A. dispar*. The endemic species *A. manillensis* and the native species *A. dispar* constitute major fishery resources in Laguna de Bay. Thus, they are economically important species. The two species look very similar externally, but they can be distinguished by examining the tooth patch morphology on the palate. However, within each species, there are variants of tooth patch morphology.

Shape differences between *A. manillensis* and *A. dispar*, between populations, and between variants within each species, were determined. Samples were obtained from Binangonan, Tanay, and Calamba areas of Laguna de Bay. Shape differences between species, between morphs within species, and among specimens of different sites were significant, but the groups were difficult to differentiate due to high overlaps in Canonical Variate Analysis (CVA) plots and low Mahalanobis distance-based correct classification percentages. This was attributed to possible introgression between *A. manillensis* and *A. dispar*.

Geometric morphometrics revealed significant shape variations among the samples. Differentiation between species and among their populations and morphs, however, was poor based on large overlaps and low correct classification percentages. It is hypothesized that there is little or no genetic differentiation between the species and among the different populations. Introgression may also be occurring between the two species in the lake as suggested by their cohabitation, presence of variable tooth patch morphologies, and the low differentiation among the different morphs. As the species hybridize,



variation between them is reduced. This can be verified in future studies using population genetic markers such as the mitochondrial control region and microsatellites. Distance-based measurements particularly involving the top of the supraoccipital, which was the most variable landmark in this study, is also recommended.

#### **Morphology of (*Barbodes hemictenus*)**

According to Torres, A.G., et al (2021) *Barbodes hemictenus* has three (3) Dorsal spines ; eight (8) Dorsal soft rays , three (3) Anal spines, and five (5) Anal soft rays. Preserved color blackish on top of head and dorsal region merging to dark olive brown on sides; paler or yellowish ventrally; minute spots forms a dark margin to scales on sides; fin rays more or less dusky. Eyes with a narrow circular gelatinous lid. Eight (8) (rarely 9) scales from nape to dorsal. 2.5 scales between origin of ventral and lateral line. Ventral axillary scale pointed, 1.5-1.75X in head. Minute pores usually cover the top of head. Short snout rounded equals eye or a seventh longer.

## **Chapter III**

### **Methodology**

#### **Materials**

1. Fishing rod (pambis)
2. Camera
3. Notebook and pen
4. Formalin solution
5. Jars
6. Digital Camera

#### **Methods**

##### **Sampling site**

The specimen collection sites will be in the two barangays of Victoria, namely, Barangays Pakyas 13°08'13"

N 121°18'33"E and Bambanin (13°07'17" N 121°18'21"E and one Barangay in Socorro Which is Barangay Pasi I 13°06'47" N 121°19'11"E. This sites are located near the south western portion of Naujan Lake (Figure 1). Conducting of the study will be in First quarter moon to last quarter moon of April and full moon to last quarter moon of May 2022, which represents dry seasons.

In each collection site, 3 replicate sampling stations with specific geographical coordinates will establish.

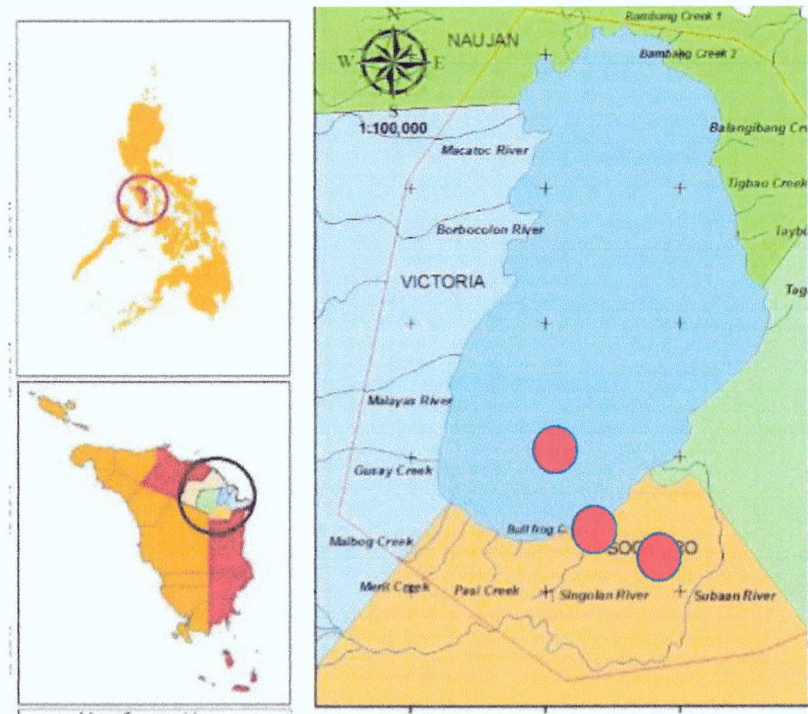


Figure 1. Study Site

### **Collection of samples**

Before the collection began the researcher will gather permits to Department of Natural Resources (DENR) and Municipal Government office to conduct the study in the area. To avoid harming the target species, non-target species and the ecosystem they live in, the researcher will use fishing rod and bait. Nine (9) field assistant will assign to designated sampling points that simultaneously fishing for three (3) hours. Gathered specimen will be put in formalin solution and will be brought in Mindoro State University laboratory for identifying its morphometric and meristic data.

### **Collection of Data**

The left side of a fish's body will be measured and photographed. A Digital Camera will be used to capture the photograph. The photographs will be transmitted to computer software for body shape digitalization. Each of the fish samples will be digitized.

Sexing will be based by direct examination of the gonads after scanning. The resulting partial scores of the images will be subjected to relative warp analysis, which quantifies body shape of the specimens. It also plots the



landmarks in a three dimensional morpho-space warp grid where variations will be shown as deformations of the grids. Images of different sex among selected existing species will be separated for comparison of body shape between the sexes. The PAST software (Paleontological Statistics Version 1.31) will be used to test and visualize the shape differences of *Barbodes hemictenus*.

Landmarks will be placed on significant points or features of the fish body for the acquisition of coordinate data that will be used to determine shape variations.

### **Data Analysis**

To determine morphological differences of *Barbodes hemictenus*, the data will be subjected to Relative Warp Analysis. The data of the relative warp analysis will be further confirmed using the scatter plot and Discriminant Function Analysis (DFA).

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<https://dx.doi.org/10.2305/IUCN.UK.2021->

2.RLTS.T18906A162163129.en



Republic of the Philippines  
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES  
NAUJAN LAKE NATIONAL PARK  
Protected Area Management Board  
Oriental Mindoro



**KATITIKAN NG PAGPUPULONG**  
**(NLNP-PAMB Executive Committee Meeting)**

Petsa: May 26, 2022

Lugar: DENR CENRO Socorro, Pasi II, Socorro, Oriental Mindoro

**Mga Dumalo:**

- |                           |   |                               |
|---------------------------|---|-------------------------------|
| 1. RAQUELITA M. UMALI     | - | MGDH-I, Naujan                |
| 2. MARILYN R. ALCANICES   | - | PAGo, Calapan                 |
| 3. RICMAR B. AZUCENA      | - | PCO, DWCC                     |
| 4. ATTY. MANUEL P. DELICA | - | MPDC, Socorro                 |
| 5. LYDIA MUÑECA S. MELGAR | - | PPDO, Calapan City (via zoom) |
| 6. RACHEL B. MONTERO      | - | SRS II, DOST (via zoom)       |

**Mga Hindi Dumalo:**

- |                          |   |                           |
|--------------------------|---|---------------------------|
| 1. LORENZO F. CARREON II | - | MPDC, Pola                |
| 2. CAROLINE G. MANUEL    | - | MPDC, Victoria            |
| 3. GRACE C. DIAMANTE     | - | Executive Director, MBCFI |

**Mga Panauhina:**

- |                              |   |                                |
|------------------------------|---|--------------------------------|
| 1. RUDOLF JAMES D. BUARON    | - | Student, MinSU                 |
| 2. ENRICO C. DUANO           | - | Student, MinSU                 |
| 3. ALFIE T. TIGUE            | - | Student, MinSU                 |
| 4. JOHN PAUL G. TELEGRAPO    | - | Student, MinSU                 |
| 5. KATHY ESCALONA            | - | Faculty, MinSU                 |
| 6. RODEL M. BOYLES           | - | CENR Officer, CENRO Socorro    |
| 7. RICARDO R. NATIVIDAD      | - | PASu, NLNP                     |
| 8. BEA NATASHA FORTU         | - | FORESTER I, PENRO              |
| 9. NESTOR G. MIRA, JR.       | - | PO II, PENRO                   |
| 10. JOSE MARIA M. FONTANILLA | - | ECOMS I/ APASu, NLNP           |
| 11. RHONA C. LIWAG           | - | Forest Ranger, CENRO Socorro   |
| 12. ERIC C. GITO             | - | Park Maintenance Foreman, NLNP |
| 13. ROMALYN F. FLORES        | - | Project Support Staff, NLNP    |

**PAGPUPULONG**

Nagsimula ang pagpupulong sa ganap na ika-9:20 ng umaga sa pamamagitan ng isang panalangin na sinundan ng pag-awit ng Pambansang Awit ng Pilipinas. Nagbigay ng panimulang pananalita si PASu Ricardo Natividad ng Naujan Lake National Park upang batiin ang mga dumalo sa araw na iyon na pinasalamatan ang bawat miyembro ng Protected Area



51 Management Board (PAMB) Executive Committee sa kanilang pagdalo at taos-pusong  
52 pakikilahok sa pagpupulong ngayong umaga. Sa bahagi ng PENRO Oriental Mindoro, ay ang  
53 kinatawan mula sa CDD na nagbigay ng kaniyang pagbati si Forester Bea Fortu para sa araw  
54 na iyon. Kinilala naman ni APASu Jose Maria Fontanilla ang mga nagsipagdalo at mga  
55 panauhin. Kanya ding ibinahagi na may anim (6) na miyembro ng PAMB Executive  
56 Committee na dumalo sa pagpupulong at may korum.

57  
58 Inihain ni PASu Ric Natividad ang nominasyon sa pangunguna ng pagpupulong na  
59 tinugunan ni MGDH-I Raquelita Umali ang pagpili ng tagapanguna. Iminungkahi niya si PCO  
60 Ricmar B. Azucena ng DWCC na manguna sa pagpupulong na sinang-ayunan ni Atty. Manuel  
61 P. Delica ng MPDC Socorro na pinangalawahan ni Bb. Marilyn M. Alcañices ng PAgO. Kaya't  
62 inumpisahan ang pagpupulong sa pangunguna niya.

### 63 64 **Presentation and Approval of the Agenda**

65  
66 Pinangunahan ni G. Azucena ang pagbabasa ng adyenda ng pagpupulong at  
67 pagpapadaloy ng bawat isang nabanggit.

### 68 69 **Meeting Agenda**

#### 70 71 **Presentation draft Policy on White Goby Protection based on conducted research**

72  
73 Humingi ng paumanhin si Bb. Marilyn Alcañices na ayon sa kaniya ay hindi pa sapat  
74 ang mga datos na hawak niya kaya't minabuti niyang hilingin sa kapulungan ang pagpapatuloy  
75 ng pagkalap para sa nasabing *draft policy*. Ang gamit sa pangingisda (*fishing gear*) pa lamang  
76 ang meron siyang nabuong polisiya at nais pa niyang isama ang panahon (*time*) at lugar  
77 (*spawning area for closed season*). Ang ginawang pag-aaral ay hindi pa sapat o established  
78 kaya't nais pa niya itong ipagpatuloy bago ihain sa kapulungan. Ang ibang research study ay  
79 manggagaling sa tulong ng Mindoro State University (MinSU) upang mabuo ang *draft policy*.  
80 Nagbigay naman ng kaniyang mungkahi si Dra. Kathy Escalona kung ano ang gustong alagaan  
81 o partikular na specie. Dahil sa ngayon ang mayroon lamang sila ay ang *general white goby* na  
82 sinang-ayunan ni Bb. Alcanices para sa madaling pagbuo ng *draft policy* para dito.

#### 83 84 **Introduction re: Training Needs Assessment (TNA) for Protected Areas**

85  
86 Ang mga sipi ng *Training Needs Assessment* o *TNA Questionnaire for Protected Areas*  
87 ay ibinahagi sa bawat miyembro ng PAMB upang mabigyang oras upang masagutan ang mga  
88 katanungan na nakatala dito. Ito ay isang pamamaraan upang ma-assess at suriin ang mga  
89 kinakailangan sa *protected area management*. Ito ay magsisilbing basehan para sa paghahanda  
90 ng isang *capacity building plan for protected areas*. Ang nasabing TNA ay target para ngayong  
91 3<sup>rd</sup> quarter activity ng PAMO.

#### 92 93 **Endorsement of additional PAMB Members**

94  
95 Iminungkahi ni G. Jose Maria Fontanilla ang pormal na pagkilala bilang bahagi ng  
96 PAMB, kinatawan mula sa DOST (Gng. Rachel Montero) at LGU Pola (MENRO Lorenz  
97 Carreon III). Upang mas maging malinaw ang pagkilala sa mga kinatawan ay ibinahagi ni Atty.  
98 Engr. Delica ang nakatala sa Sec. 11, (b) ng NIPAS Act of 2018. Dagdag pa niya ang  
99 pagbibigay ng liham para sa mga munisipyong may bagong halal na Punongbayan upang



ipagbigay alam ang kinatawan ng PAMB sa kasalukuyan at kung ito ay ipagpapatuloy pa at pagtitibayin ng bagong halal na Punongbayan. Gayundin ang parehas na mungkahi ni Gng. Raquelita Umali para sa kaniyang panig. Kaya't mungkahi ni CENRO Boyles ang pagsasagawa ng pagsusuri ng mga endorsement ng bawat PAMB member sa bahagi ng PAMB Secretariat.

#### **Concern about the membership of Philippine National Police (PNP) in the PAMB**

Ang usaping ito ay ibinahagi kasabay ng naunang adyenda kung saan ang kinatawan na ilalagay sa liham ay ang opisina ng Philippine National Police (PNP) bilang bahagi ng komposisyon ng PAMB. Nasa kanilang panig na lamang kung sino ang bibigyan ng pahintulot na maging kinatawan sa PAMB tuwing may pagpupulong.

#### **Updates on the coordination with Philippine Coast Guard and MARINA re: registration of boats**

Ayon kay G. Fontanilla, sa ginawa nilang pagbisita sa Coast Guard at Marina ay nagbahagi sila ng ilang mga proseso at *format* ng pagrerehistro ng bangka.

#### **OTHER MATTERS**

#### **MINSu Students Presentation of their studies to conduct inside Naujan Lake**

Bago inumpisahan ang pagpapakita ng isang powerpoint presentation ay ibinahagi ni Dra. Kathy Escalona ang kahalagahan ng pag-aaral na ito at kanilang pagbibigay abiso sa PAMB bago pa man umpisahan ang nasabing pag-aaral. Matapos ang pagpapaliwanag sa gagawing mga pag-aaral at bilang pagkonsidera sa ginawang presentasyon ng mga estudyante ng MinSU, binigyan ito ng papuri ni Gng. Raquelita Umali. Dagdag pa ni Bb. Alcanices kung sila ay mabibigyan ng pagkakataon na makasama sa isa sa mga gagawing pagsusuri. Iminungkahi naman ni CENRO Rodel Boyles na sa dahilan na rin na sila ay may hinahabol na panahon upang maisumite ang nasabing pagsusuri ngayong Hulyo ayon kay Dra. Kathy na magiging kanilang *final defense* ay maari na lamang silang gumawa ng Memorandum of Understanding o MOU para sa pagdali ng proseso nito. Dagdag naman ni Atty. Engr. Manuel Delica na gumawa na sila ng kaukulang request para sa *proposed activities* upang malarisagawa na ang pag-aaral. Isang mungkahi pa mula kay CENRO Boyles na ito ay gawin na lamang *research initiative* na magkaagapay ang MinSU at PAMB para sa mga *research studies* na gagawin o *joint initiative* para sa dalawang ahensya. Gayundin ang paggawa ng *clearance* at resolusyon nito na nakasaad ang pagpapatupad ng *data sharing* at *publication* para sa mga pagsusuri o pag-aaral na gagawin ng MinSU at magiging resulta nito para sa bahagi ng *academe* na isa sa mga kinatawan ng PAMB.

#### **Resolutions with comments, recommendations and instructions from the Regional Office**

- Resolution No. 1, Series of 2021 re: *Resolution Authorizing the Protected Area Management Office (PAMO) thru Protected Area Superintendent (PASu)/Assistant PASu to Issue/Release Clearance or Certification as Requirement for Issuance of Cutting Permit within Titled Property covered by the Naujan Lake National Park.* – Ang ginawang pagpapaliwanag dito na bagaman ang PAMB ay nagbibigay ng naturang sertipikasyon, ito ay alinsunod lamang sa requirements na kailangang tugunan kaya't iminungkahi ni CENRO Boyles na tanggalin na lamang ang salitang “clearance” sa naturang resolusyon



156 **OTHER MATTERS**

157  
158 **Resolutions with comments, recommendations and instructions from the Regional Office**

- 159
- 160 • Resolution No. 1, Series of 2021 re: *Resolution Authorizing the Protected Area*  
161 *Management Office (PAMO) thru Protected Area Superintendent (PASu)/Assistant PASu*  
162 *to Issue/Release Clearance or Certification as Requirement for Issuance of Cutting Permit*  
163 *within Titled Property covered by the Naujan Lake National Park.* – Ang ginawang  
164 pagpapaliwanag dito na bagaman ang PAMB ay nagbibigay ng naturang sertipikasyon, ito  
165 ay alinsunod lamang sa requirements na kailangang tugunan kaya’t iminungkahi ni  
166 CENRO Boyles na tanggalin na lamang ang salitang “clearance” sa naturang resolusyon at  
167 banggitin na ang “certification” ay ibinibigay bilang “supporting documents” lamang sa  
168 naturang “request”. Sa huli ito ay minungkahi ng PAMB para baguhin ang nasabing  
169 resolusyon ayon sa napagkasunduan na sinang-ayunan ng karamihan.
  - 170 • Resolution No. 11, Series of 2021 re: *Resolution endorsing the provision of honorarium*  
171 *for NLNP-PAMB members during regular meetings.* – Para sa kaalaman ng bawat PAMB  
172 member ito ay hindi inaprubahan, sa dahilan na ang pagiging kinatawan dito ay isang bukal  
173 sa pusong paglilingkod para sa pagpapatupad ng batas para sa Naujan Lake National Park.  
174 Ito ay walang tatanggapin na kahit anong kabayaran o *honorarium* sa mga dadaluhang  
175 pagpupulong na patawag ng NLNP-PAMB. Kaya’t iminungkahi ni Atty. Delica na palitan  
176 ang mga kataga sa unang resolusyon na isinumite na “*provision of actual, necessary*  
177 *subsistence travelling expenses*” upang bigyang-katwiran ang nasabing resolusyon.
- 178

179 **Updates on Consolidation of maps of NLNP for the proposed proclamation**

180  
181 Nabanggit dito ang pagbuo ng isang Technical Working Group o TWG para maiproseso  
182 ang pagsasagawa ng *Public Notification (Consultation)* upang matugunan ang mga *requirements*  
183 na kailangang tuparin para sa pagpasa ng Naujan Lake National Park bilang isang protected area  
184 sa ilalim ng ENIPAS Act.

185  
186 Natapos ang pagpupulong sa ganap na ika-1:04 ng hapon sa pamamagitan ng mungkahi ni  
187 Bb. Alcañices ng PAgO na pinangalawahan ni MGDH-I Umali ng LGU Naujan.

188  
189  
190 Inihanda ni:

191  
192 **RICARDO R. NATIVIDAD**  
193 PASu, NLNP/PAMB Secretariat

194  
195  
196 Pinatunayan ni:

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198 **RICMAR B. ALUCENA**  
199 PCO, DWCC/Tagapanguna

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201  
202 Pinagtibay ni:

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204 **LORMELYN E. CLAUDIO**  
205 Regional Executive Director/PAMB Chairperson  
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## MEMORANDUM OF AGREEMENT

### KNOW ALL MEN BY THIS PRESENTS:

**This Memorandum of Agreement entered into by and between:**

The **Department of Environment and Natural Resources** of the Republic of the Philippines with principal address at the DENR MIMAROPA Region, Regional Office IVB, 1515 L & S Building, Roxas Boulevard, Ermita, Manila referred to as “DENR” and represented by its Regional Executive Director and Protected Area Management Board Chairperson of Naujan Lake National Park, **LORMELYN E. CLAUDIO, CESO IV**;

-and-

The **Mindoro State University**, through the Center for Environmental Studies (CES) with office address at Barangay Alcate, Victoria, Oriental Mindoro herein referred to as “MinSU” represented herein by its President **Dr. LEVY B. ARAGO, JR.**;

### WITNESSETH

**WHEREAS**, the **DENR**, by virtue of Executive Order 192 is the Philippine Government Agency mandated to manage, protect and conserve the country’s natural resources, including wildlife and other biological resources, for the present and future generations;

**WHEREAS**, the **DENR**, in pursuit of its mandate, is committed to enrich the information and regarding the country’s biological diversity and address the urgent need to develop scientific, technical and institutional capacities to plan and implement appropriate measures in conserving these resources;

**WHEREAS**, the **DENR**, shall collaborate with local and foreign institutions in implementing various biodiversity conservation-oriented programs of scientific researches for social, economic and scientific benefits;

**WHEREAS**, one of the primary goals of the **DENR** is the sound management of the country’s wildlife resources, through habitat management, scientific researches and conservation among other approaches;

**WHEREAS**, the Philippines, being one of the mega-diversity countries and one of the biodiversity hotspots in the world, should receive all combined efforts;

**WHEREAS**, **Republic Act 9147** otherwise known as the Wildlife Resources Conservation and Protection Act 2001 and its implementing Rules and Regulations, allows the collection and utilization of biological resources for scientific researches but not for commercial purposes upon the execution of understanding/agreement by the DENR Secretary or authorized representative;

**WHEREAS**, the collection of wildlife for scientific research requires the execution of an **Affidavit of Understanding (AU) and Memorandum of Agreement (MOA)** by and between the Regional Director and the proponent or his authorized representative prior to the issuance of **Gratuitous Permit**;

**WHEREAS**, Republic Act 11038, otherwise known as the Expanded National Integrated Protected Areas System (ENIPAS) Act of 2018 amended Republic Act 7586 or NIPAS Act of 1992, provides the conservation, protection and management of protected areas like Naujan Lake National Park (NLNP) as an initial component;



**WHEREAS**, NLNP has been designated as a Wetland of International Importance to the Ramsar List, as well as recognized as a Conservation Priority Area (CPA), Important Bird Area (IBA), and Key Biodiversity Area (KBA);

**WHEREAS**, under RA 11038, the PAMB and the Protected Area Superintendent (PASu) as the Chief Operating Officer of the Protected Area shall be responsible for the effective implementation of the PA management plan;

**WHEREAS**, the DENR Regional Office together with the PAMB and Protected Area Management Office is charged with the monitoring, assessment, evaluation and provision of administrative and technical assistance in the implementation of the project referred to in this Agreement;

**WHEREAS**, MinSU is an educational institution conducting advance scientific studies and researches, the immediate or long term benefits of which – whether direct or indirect – shall be shared equitably by the parties;

**WHEREAS**, MinSU is committed to develop highly trained globally competent students and professionals, generate innovative and cutting edge knowledge and technologies for people empowerment and sustainable development;

**WHEREAS**, MinSU shall constantly seek for more effective and yet most economical ways of pursuing its vision and mission and goals amidst resources;

**WHEREAS**, MinSU puts prime value on our living planet, accepts the responsibility, adopts practices to protect environment thru scientific undertakings; and

**WHEREAS**, MinSU recommends policy measures to the DENR regarding the conservation and protection of flora

**NOW, THEREFORE**, for and in consideration of the foregoing premises, and of the mutual covenants contained herein, the Parties agreed as follows:

## **ARTICLE 1. RESPONSIBILITIES OF THE DENR**

### **The DENR shall:**

- 1.1 Provide technical assistance in the collection of fish specimens specifically *Glossogobius sp.*, *Leiopotherapon plumbeus*, *Giuris margaritaceus*, *Barbodes hemictenus* and other fauna and flora species within the Municipalities of Naujan, Pola, Socorro and Victoria covering Naujan Lake National Park;
- 1.2 Inspect and verify shipments of wildlife resources, of fish specimens specifically *Glossogobius sp.*, *Leiopotherapon plumbeus*, *Giuris margaritaceus*, *Barbodes hemictenus* and other fauna and flora species, its by-products and derivatives for local transport;
- 1.3 Enforce existing wildlife laws, rules and regulations and such other orders and regulations that may be promulgated for the protection of flora and fauna species;
- 1.4 Seize and confiscate illegally collected, possessed and traded wildlife by product and derivatives in favor of the government or refuse clearance when there are reasonable grounds to believe that existing wildlife laws, rules and regulations or the CITES have been violated;
- 1.5 Conduct investigation and receive evidence regarding the commission of any of the offenses defined under RA 9147 and RA 11038 as amended RA 7586 within the area of assignment, whether or not such offense was committed in their (DENR Officials) presence; and
- 1.6 Allow scientists and researchers affiliated with the MinSU to participate in any project and/or related undertakings; Provided, that all activities of the affiliated scientists/researchers are in accordance with this Agreement, provided further, that the MinSU shall ensure that all the terms and conditions in this agreement are complied with by the affiliated scientists/researchers;



## ARTICLE 2. RESPONSIBILITIES OF THE MINDORO STATE UNIVERSITY (MinSU)

### The MinSU shall:

- 2.1 Drive attention of scientific community to wide and rich biological diversity of fish specimens specifically *Glossogobius* sp., *Leiopotherapon plumbeus*, *Giuris margaritaceus*, *Barbodes hemictenus* and other fauna and flora species in Naujan Lake National Park.;
- 2.2 Ensure that the specimens collected and transported outside the country meet quarantine procedures;
- 2.3 Spin-off technology shall not developed out of the results of scientific study research, thesis or dissertation;
- 2.4 Intellectual property rights over the result shall not be applied without prior approval of the scientist concerned agency;
- 2.5 Commit that the specimens collected shall not be transported from the place of collection to any other place without the Local Transport Permit and/or Export Transport Permit issued by the DENR office that has jurisdiction over the collection site. For this purpose, the concerned affiliated researcher(s) shall present the collected specimens for inspection and issuance of the necessary Transport Permit;
- 2.6 Commit that the specimens collected shall be deposited to the **MinSU** at Biology Laboratory, Alcate, Victoria, Oriental Mindoro and or other mutually agreed depository institution.
- 2.7 In case there is a need to transfer any of the collected specimens in the possession of the **MinSU** to any other party/individual or entity for further taxonomic or for museum purposes, the **MinSU** shall secure consent/express approval from, the **DENR** prior to any transfer of such specimen/s;
- 2.8 Ownership of all specimens collected, including those deposited transferred to any other party in accordance with the immediate preceding provision shall remain the property of the **Philippine Government**;
- 2.9 Agree that the specimens collected shall be used strictly in pursuit of the biodiversity and conservation related activities under this agreement and shall not in any manner be used for commercial purposes or for extraction of genetic material for commercial purposes;
- 2.10 Commit to secure **Export Permit** from the DENR Regional Office concerned or Biodiversity Management Bureau for CITES species prior to any shipment of collected specimens outside the country and also ensure that such specimens are free from or are not carriers of any disease that can pose danger to the health and safety of humans and other organisms;
- 2.11 Undertake public education and awareness campaign on biodiversity conservation especially in communities within or near the study sites;
- 2.12 Allow **DENR** personnel access to the specimens deposited with the **MinSU** and/or other entities for further studies and to all research-related information data generated in accordance with this **Agreement**;
- 2.13 Agree to a fair and equitable sharing of benefits arising from the research /study from the used of traditional knowledge, innovations and practices in the conduct of research related activities;
- 2.14 Acknowledge the **DENR** and other stakeholders in all research, experimental data or materials produced from the undertaking;
- 2.15 Accord co-authorship of materials, reports, articles and/or publications to the **DENR** personnel, PAMB members and PAMO personnel and other **Filipino** scientists/individual(s) substantially involved in the researches to be implemented;
- 2.16 Submit terminal reports including conclusion of the research, the result of the recommended plan of action, and pictures of collected *Leiopotherapon plumbeus*, *Giuris*



- margaritaceus*, *Barbodes hemictenus* and other fauna and flora species in Naujan Lake National Park, with geo-tagged, at the end of the project in hard and in soft copy;
- 2.17 Abide by other provisions of the Republic Act 9147 and RA 11038 as amended 7586 as well as its Implementing Rules and Regulations and other pertinent Laws and Regulations, as may be applicable and appropriate;
- 2.18 Ensure that all the terms and conditions of this **Agreement** are complied with by the affiliated scientists/researches;
- 2.19 Acknowledge that any fraudulent act or violation of any of the terms and conditions herein set forth is sufficient ground to revoke this **Agreement** and to deny any **succeeding request** for permit to conduct studies on any biological and genetic resources in the Philippines.

### ARTICLE 3. OTHER PROVISIONS

- 3.1 In instances where discoveries are developed from the conduct of research on the Philippines endemic species, the permittee shall make available to the **Philippine Government**, the use of technologies, commercially and locally, without paying royalty to permittee, provided however that the appropriate and applicable, other agreements maybe negotiated between the **DENR** and **MinSU**;
- 3.2 In the event that a product with commercial and high economic value is discovered from the use of the specimens collected and/or research undertaken and in case of commercial use of such discovery/technology, the **MinSU** shall enter into a **Commercial Research Agreement (CRA)** or any appropriate legal instrument for the purpose with the **DENR** in accordance with **DAO No. 96-20 (Implementing Rules and Regulations on the Prospecting of Biological and Genetic Resources)**, section 14 and 15 of R.A. 9147 and its Implementing Rules and Regulations;
- 3.3 Inform the Philippine Government thru the **DENR** and the **Indigenous Communities** if any, of such activity conducted;
- 3.4 Remit/pay to the Philippine Government thru the **DENR-Licenses, Patents and Deeds Division** and the **local or indigenous cultural community** patent royalties if any, in the amount and manner to be mutually agreed upon by the **Parties** to the **CRA**.

### ARTICLE 4. LIMITATIONS

- 4.1 The **MinSU** shall not enter into any contact or agreement with assume obligation on behalf of or in the name of the **DENR** in the course of implementing this Agreement without the written consent of the same.

### ARTICLE 5. TERMS OF AGREEMENT

- 5.1 This Memorandum of Agreement shall remain valid and effective for a period of five (5) years from the date of signing thereof. **Renewal** for another **five (5) years** subject to submission of reports specified in **Article 2** item number **2.14** of this **Agreement** and other relevant documents as may be appropriate and necessary and/or as may be required by the **DENR**.
- 5.2 This **Agreement** is subject to annual review and may be revised or modified upon mutual written consent of the **Parties**; and
- 5.3 Deliberate disregard by the **MinSU** of any of the terms and conditions stipulated herein, and/or any of the provision(s) of relevant laws, rules and regulations shall result to the automatic cancellation of this **Agreement**, without prejudice to the application of other

appropriate measures in accordance with relevant laws and/or policies of the **Philippine Government**.

**IN WITNESS WHEREOF**, the Parties herein have caused this Memorandum of Agreement to be signed, through their respective representatives on the date and place first written above.

**Department of Environment and Natural Resources**

**Mindoro State University**

**LORMELYN E. CLAUDIO, CESO IV**  
Regional Executive Director

**Dr. LEVY B. ARAGO JR.**  
President

**Witnesses**

**KATHERINE P. SANCHEZ-ESCALONA**  
MCES In-Charge

**RODEL M. BOYLES**  
CENRO

**REPUBLIC OF THE PHILIPPINES**  
**Metro Manila**

Before me, a notary public for and in the Province \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_, 2022, personally appeared.

NAME	Identification No.	Date/Place issued
1. LORMELYN E. CLAUDIO, CESO IV		
2. Dr. LEVY B. ARAGO JR		

Known to me to be persons who executed the foregoing instrument and the acknowledged to me that the same is their free and voluntary act and deed as well as the voluntary act the institution/agency they represent.

This instrument consists of six (6) pages including this page wherein the ACKNOWLEDGEMENT is written and duly signed by the parties on each and every page hereof.

**WITNESS MY HAND AND SEAL**, on the date at the place first above-written.

Doc No. \_\_\_\_\_  
Page No. \_\_\_\_\_  
Book No. \_\_\_\_\_  
Series of 2022

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