

# An Ecological Assessment for Offset Site Wetland Conservation and Management

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# Presentation Outline

- I. Ecological Assessment
- II. Wetland Offsetting
- III. Frameworks and guidelines in offsetting
- IV. Wetland Offsetting: The Case of Valenzuela and Paligui Wetlands
- V. Rapid Ecological Assessment Results: Valenzuela
- VI. Rapid Ecological Assessments Results: Paligui, Candaba
- VII. Conclusion

# I. Ecological Assessment



“An ecological assessment is part of an EIA study for a designated project which may have an impact on the natural environment including existing flora, fauna and wildlife habitats.”

*Source: Environmental Protection Department, 2011*



# I. Ecological Assessment (Objective)



- To provide sufficient and accurate ecological data
- To come up with objective identification, science base prediction and evaluation of the potential ecological impacts.

*Source: Environmental Protection Department, 2011*

## II. Wetland Offsetting

- **Measurable conservation outcomes** resulting from actions designed to **compensate for significant residual adverse impacts** on wetlands (*including all impacts on water resources, including hydrological and ecological processes and function, and wetland biodiversity including ecosystems, habitats and species*).

Source: Macfarlane, et al., 2014





## II. Wetland Offsetting

- follows the concept of “no net loss” *a strategy that is expressed in terms of no net loss of wetland area and/or ecological character overall, at a given geographical scale (often national).*
- Impacts may be permitted, but compensation (*through restoration or creation*) **is necessary to counterbalance these impacts**, not necessarily site-by-site but at the level of the totality of the wetland resource.

Source: Ramsar, 2012



# III. Frameworks and Guidelines in Wetland Offsetting

- Compensating for wetland impacts refers to actions that are intended to offset the residual impacts on wetland ecological character that remain after any mitigation has been achieved.
- An example of compensation would be an on-site or off-site wetland restoration or creation project, provided it adds value beyond what would have happened otherwise.

*Source: Ramsar, 2014*

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Describe (site) ecological character



Monitor (site) ecological character



Identify potential change in (site) ecological character and assess whether it would exceed limit of acceptable change



Avoid change (site) ecological character



If change in ecological character has occurred or cannot be avoided



Mitigate in situ for unavoidable change in (site) ecological character

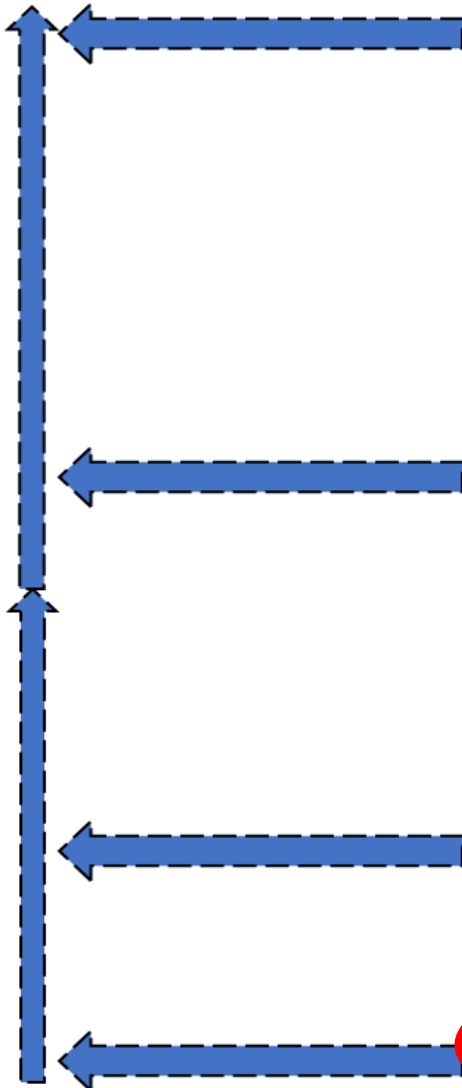
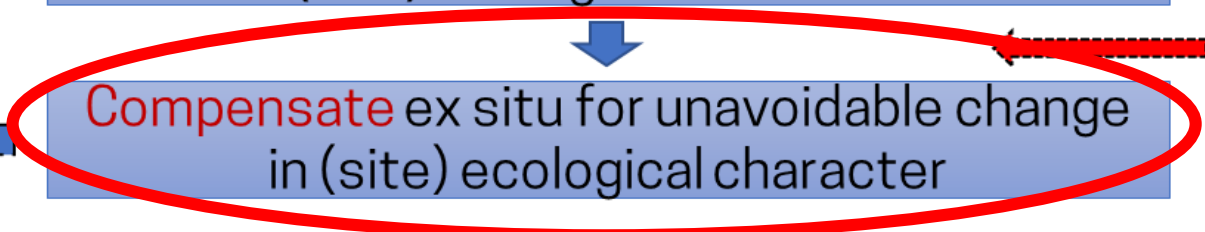


Compensate ex situ for unavoidable change in (site) ecological character

Application of criteria for avoidance

Application of criteria for mitigation

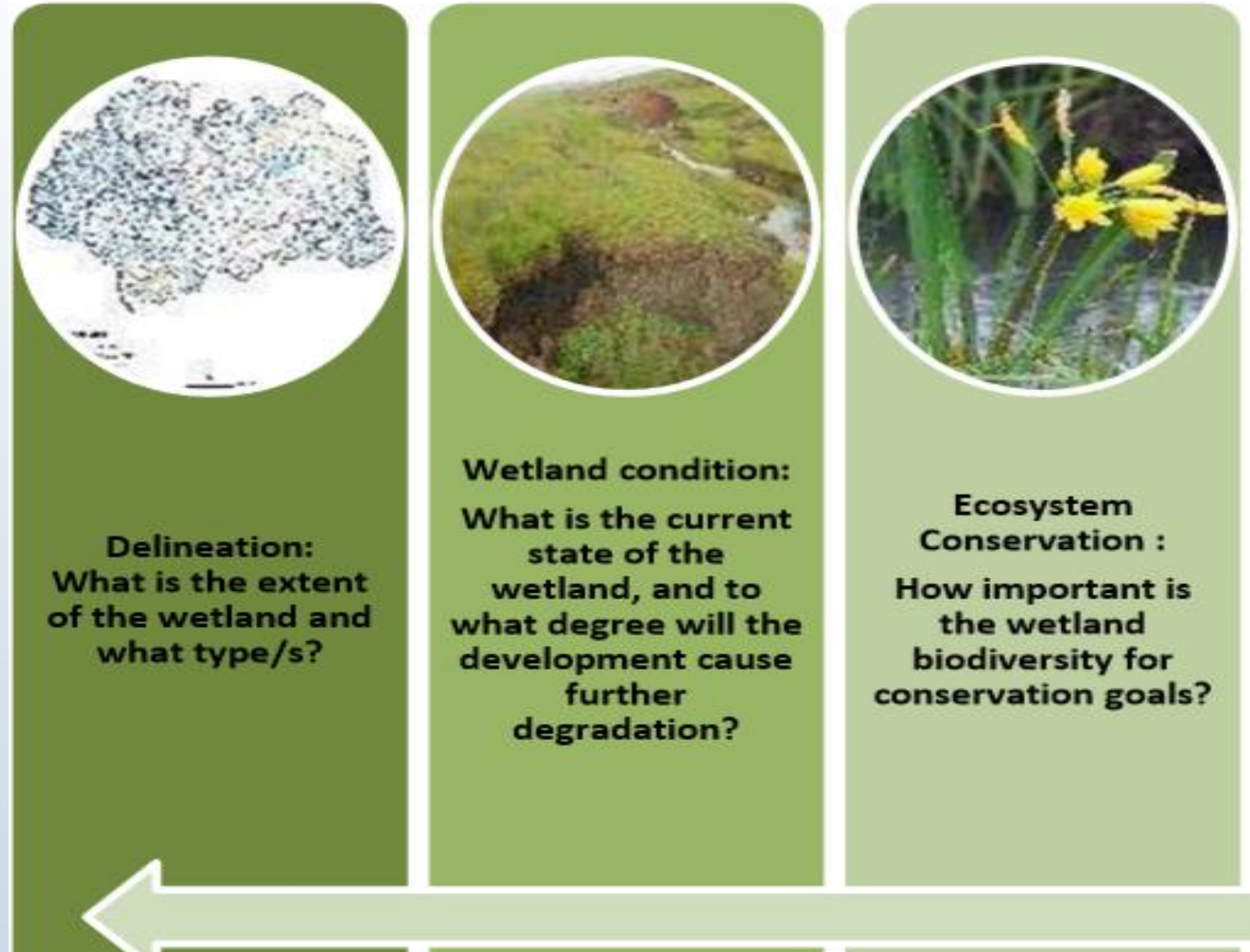
Application of criteria for compensation





# III. Frameworks and Guidelines in Wetland Offsetting

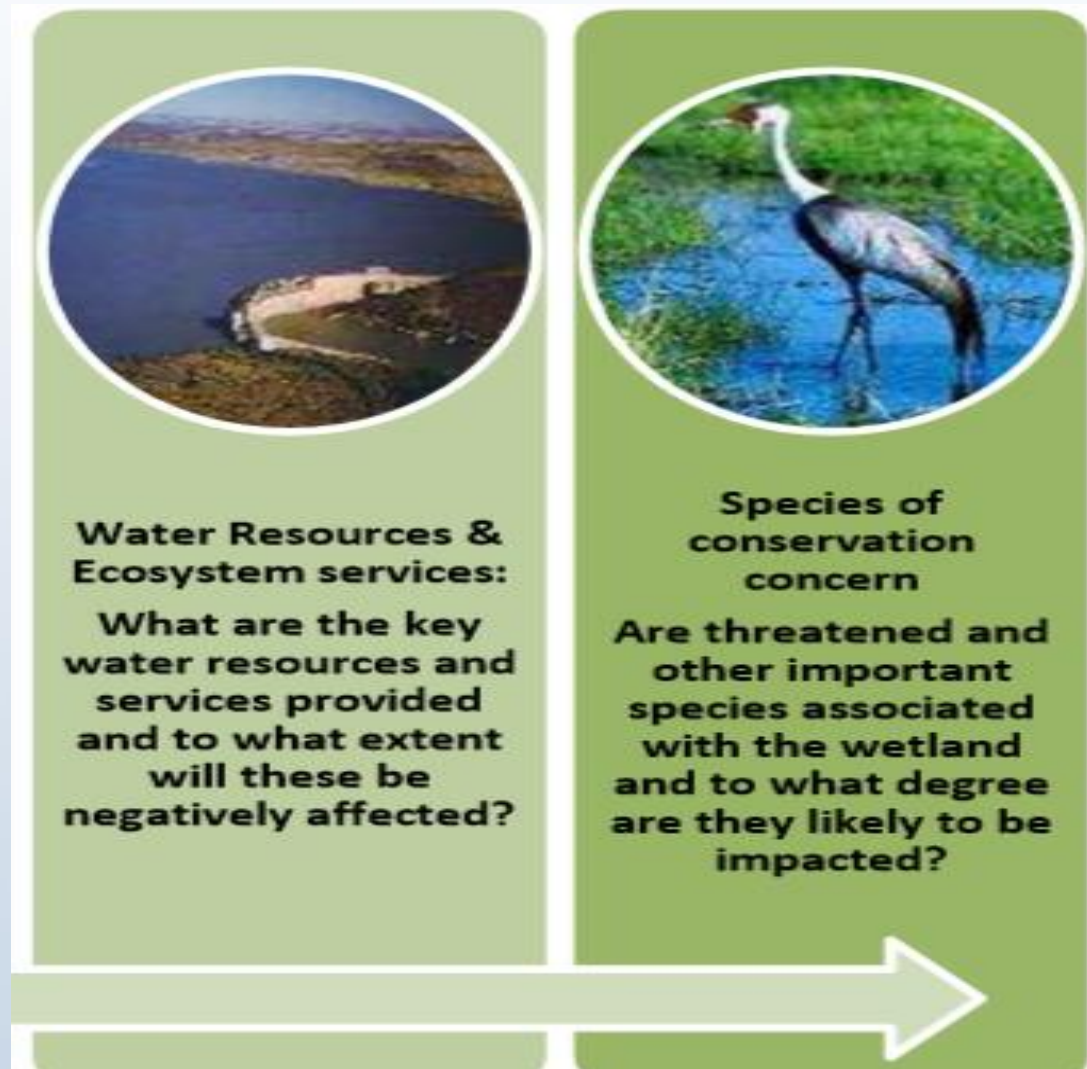
*Key aspects of the assessment of required wetland offset*



Source: Macfarlane, et al., 2014

# III. Frameworks and Guidelines in Wetland Offsetting

*Key aspects of  
the assessment  
of required  
wetland offset*



Source: Macfarlane, et al., 2014



# IV. Wetland Offsetting: *The Case of Valenzuela and Paligui Wetlands*

- The Northrail has leased 13.822 hectares of the property of National Food Authority (NFA) to be used as exclusively for the Depot.
- The proposed stabling yard or parking location for trains (depot) is located in a government-owned lot within the National Food Authority (NFA), which is situated at the boundary of Meycauayan and Valenzuela.



**Figure 1. The Project Site**

Source: JICA Study Team as cited by EPRMP, 2015



# IV. Wetland Offsetting: *The Case of Valenzuela and Paligui Wetlands*



*The wetland in Valenzuela which will be affected by Northrail Project*

The Society for the Conservation of Philippines Wetlands, Inc. (SCPW) provide technical assistance in identifying a wetland area in order to ***offset the loss of habitat, conserve and enhance*** the area that will attract the birds and stay here instead.

# IV. Wetland Offsetting: The Case of Valenzuela and Paligui Wetlands

*Ramsar Convention Secretariat Handbook 13 (Inventory, Assessment and Monitoring) and Handbook 15 (Wetland Inventory) Ramsar Technical Report No. 1.*

- Rapid assessment of wetlands entails not just characterization of the habitat and the organisms found within but also looking at status, threats and trends.
- But implies that methods are adapted to permit the adequate collection, analysis and presentation of the assessment information when it is urgently needed.



- Due to the short time span for the study, *rapid assessment was the preferred approach for this study.*



## IV. Wetland Offsetting: The Case of Valenzuela and Paligui Wetlands

The methods and approaches in this study are **guided by the Ramsar Handbook 13** (Inventory, Assessment and Monitoring) and **Handbook 15** (Wetland Inventory) particularly the section on *“Describing the ecological character of individual wetlands.”*

Table 1. The parameters methods and tools that will be used in the assessment of the project site.

| Activity/Parameters  | Methods/Tools  |
|--|--|
| Area, boundary and dimensions  | Geographic Information System (GIS) and ground-truthing        |
| Climatic Conditions  | secondary data   |
| Water regime and water quality   | secondary data; field work; interviews, multi-parameter tester |
| Flooding incidents   | secondary data; interviews                                     |
| Noteworthy Flora/Plant Communities (Vegetation zones, Vegetation structure, Rare and unique species, Seasonal/migratory species) | visual observation, opportunistic sampling                     |
| Noteworthy Fauna/Animal Communities (Main species present, Rare and unique species, Seasonal/migratory species)                  | visual observation, bird count, interviews, literature survey  |
| Wetland Benefits (Ecosystem Services)  | visual observation; secondary data; interviews                 |
| Management Information   | secondary data; visual observation; interviews                 |
| Local Land Use   | secondary data; visual observation; interviews                 |
| Land Use within the River Basin  | secondary data; visual observation; interviews                 |
| Current farming practices and local knowledge  | Interviews   |
| Existing Pressures and Threats   | secondary data; visual observation; interviews                 |



# IV. Wetland Offsetting: The Case of Valenzuela and Paligui Wetlands

## Considerations in offset site Selection

- ✓ *approximate the ecological character* of the original wetland and *provide the same or more than the ecological services* the original wetland provides;
- ✓ least **15 hectares** that is *contiguous*;
- ✓ harbor or has *potential to harbor migratory birds*, and
- ✓ as much as possible, it should be a *public land*.



# IV. Wetland Offsetting: The Case of Valenzuela and Paligui Wetlands

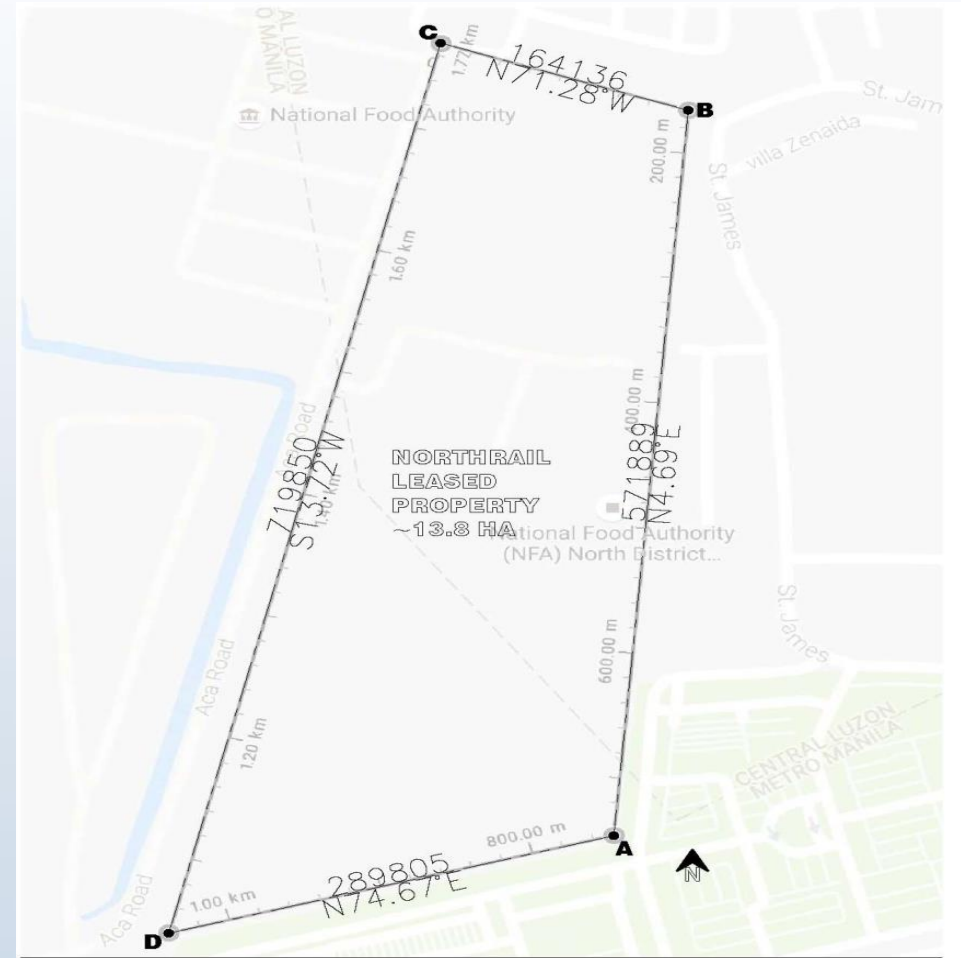
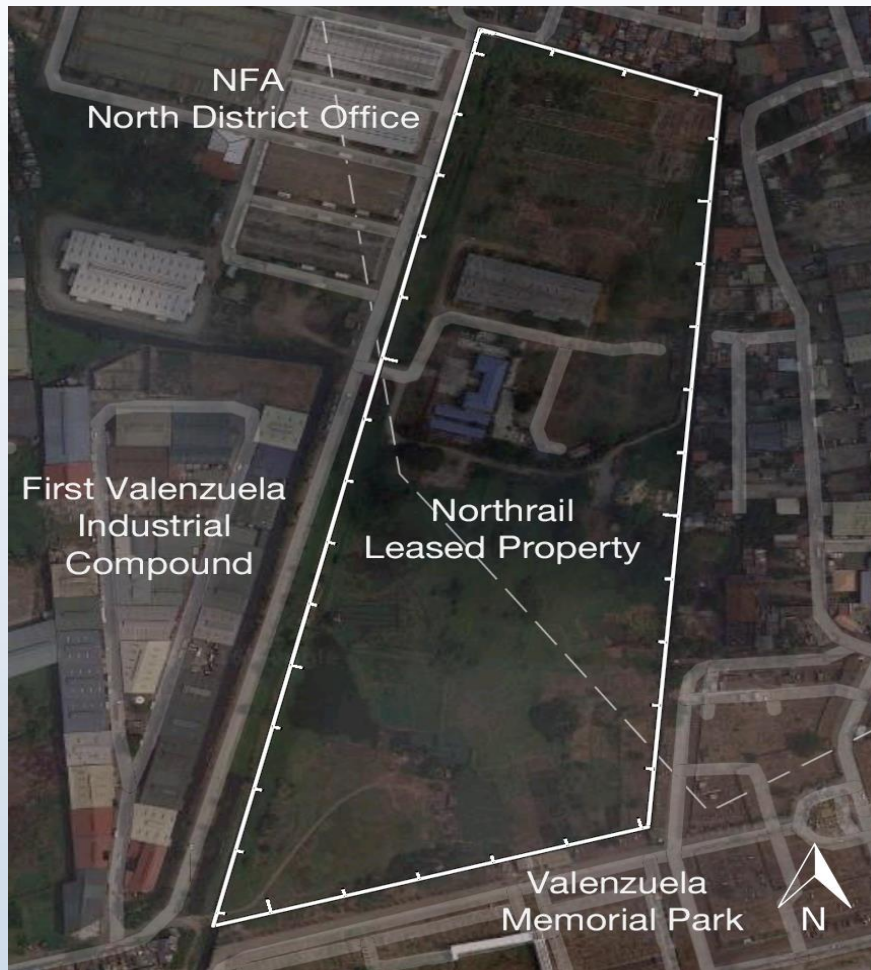
## Off Site Selection

- ✓ Gather secondary data for possible sites
- ✓ Conducted Interview
- ✓ Reconnaissance survey in the possible area in the provinces of Bulacan and Pampanga
- ✓ Courtesy call / meeting with LGUs in the area (*to verify information for the purpose of coming up with a shortlist of potential candidate offset sites*)





# IV. Rapid Ecological Assessment Result: Valenzuela



*Approximate dimensions of Northrail Leased Property*

Source: Author adapted from Google Earth



# V. Rapid Ecological Assessment Result: Valenzuela

## Climatic Conditions

- Dry Season - November to April
- Wet season – May to October
- Humidity - monthly relative data values from 66% to 84%
- Temperature - ranges from 22.4 °C to 31.8 °C
- Amount of Rainfall
  - estimated **149** rainy days in a year with an average of **2,413.9** mm of rainfall



*Source: Valenzuela CLUP, 2016 & EPRMP, 2015*

# V. Rapid Ecological Assessment Result: Valenzuela

## Water Quality

- Coliform: >160,000 MPN/100ml (high)
- Organic content: BOD: 55 mg/l (high)
- Dissolved Oxygen: (DO<2 mg/l) (very low concentration)
- Presence of surfactants or methylene blue active substances (MBAS: 1.7 mg/l)



Water Sampling Station along the portion of the creek of Valenzuela Depot) at Brgy. Malanday, Valenzuela City

Source: Ecosyscorp, Inc.

\*The latest water quality data of Ecosyscorp, Inc. (September 2016), the **water quality** is still **highly polluted with an increase in BOD (62 mg/l), high coliform value (3,500,000 MPN/100ml) and a very low DO (2 mg/l).**



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora or Plant Community Survey

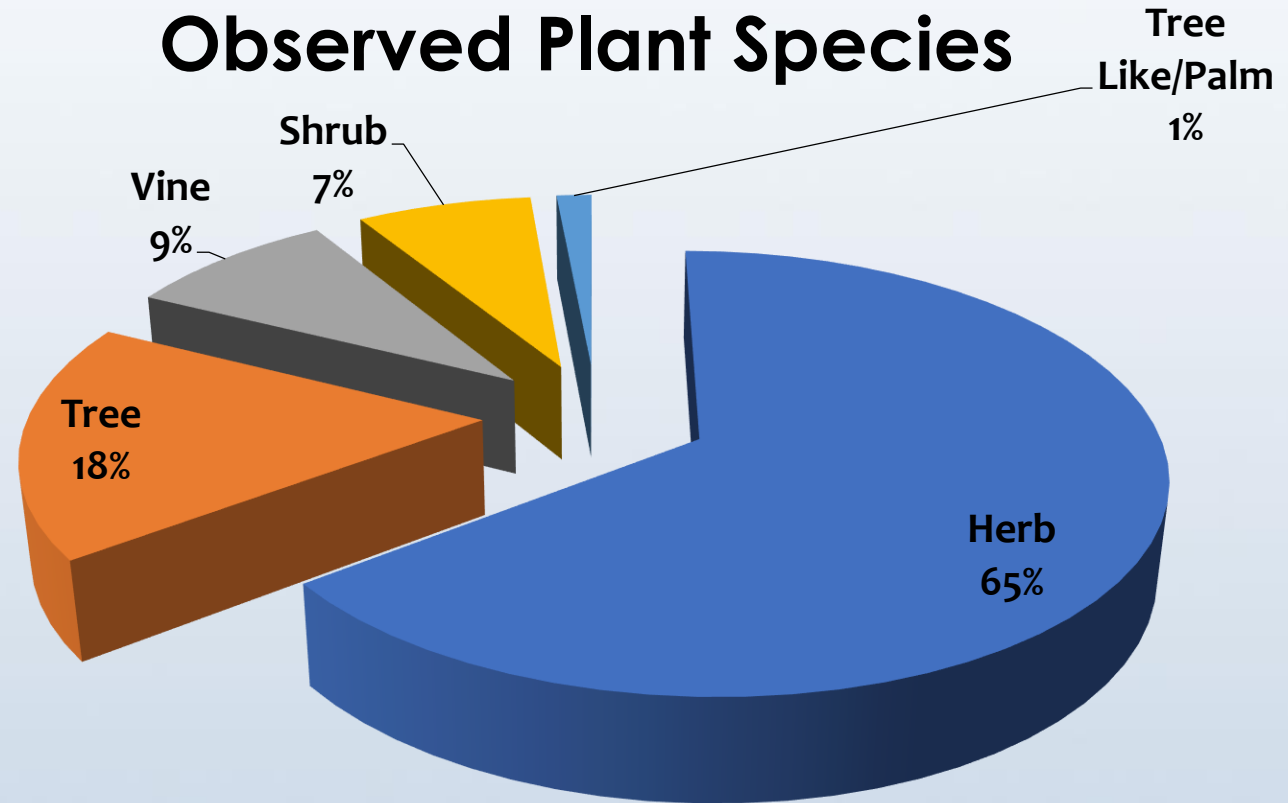
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# V. Rapid Ecological Assessment Result: Valenzuela

Flora or Plant  
Community  
Survey



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora



© Dr. Tohid Nooralvandi via LinkedIn

Scientific Name: *Abelmoscus esculentus*  
Common Name: Okra  
Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Albiza saman*  
Common Name: Rain Tree/ Akasya  
Habit: Tree



© southeasternflora.com

Scientific Name: *Amaranthus viridis*  
Common Name: Kulitis  
Habit: Herb



© keyserver.lucidcentral.org

Scientific Name: *Axonopus compressus*  
Common Name: Carabao Grass  
Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Alstonia sp.*  
Common Name: Octopus plant  
Habit: Tree



© phytoimages.siu.edu

Scientific Name: *Alternanthera sessilis*  
Common Name: Bonga-bonga  
Habit: Herb



© plantbook.org

Scientific Name: *Azadirachta indica*  
Common Name: Neem  
Habit: Tree



© Sh@ist@ via Flickr

Scientific Name: *Borreria ocymoides*  
Common Name: Siksik-parang  
Habit: Herb



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora



© natureloveyou.sg

Scientific Name: *Calopogonium mucunoides*

Common Name: Balatong aso

Habit: Vine



© spicesmedicinalherbs.com

Scientific Name: *Carica papaya*

Common Name: Papaya

Habit: Herb



© uforest.org

Scientific Name: *Coccinea grandis*

Common Name: Tamling

Habit: Vine (Invasive Alien Species)



© Rafael Aizpuria via herbario.up.ac.pa

Scientific Name: *Cocos nucifera*

Common Name: Coconut

Habit: Tree-like/palm



© keyserver.lucidcentral.org

Scientific Name: *Centrosema pubescence*

Common Name: Pukingan

Habit: Vine



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Cleome rutidosperma*

Common Name: Apoy-apoyan

Habit: Herb



© hardytropicals.org

Scientific Name: *Colocassia esculenta*

Common Name: Gabi

Habit: Herb



© prota4u.org

Scientific Name: *Commelina bengalensis*

Common Name: Ulikbangon

Habit: Herb



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora



© wetlandinfo.ehp.qld.gov.au

Scientific Name: *Commelina diffusa*  
Common Name: Tari-tari  
Habit: Herb



© keyserver.lucidcentral.org

Scientific Name: *Cynodon dactylon*  
Common Name: Bermuda grass  
Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Cyperus iria*  
Common Name: Payung payong  
Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Dactyloctenium aegyptium*  
Common Name: Crowfoot grass  
Habit: Herb



© prota4u.org

Scientific Name: *Cyperus compressus*  
Common Name: Gisai-kalabaw  
Habit: Herb



© Meike Piepenbring via herbario.up.ac.pa

Scientific Name: *Cyperus imbricatus*  
Common Name: Balabatungan  
Habit: Herb



© wetlandinfo.ehp.qld.gov.au

Scientific Name: *Delonix regia*  
Common Name: Fire Tree  
Habit: Tree



© stuartXchange.org

Scientific Name: *Desmodium giganteum*  
Common Name: Mangkit  
Habit: Herb



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora



©Forest & Kim Starr (USGS) via tropicalforages.info  
Scientific Name: *Desmodium triflorum*  
Common Name: Pakpak langaw  
Habit: Herb



© luirig.altervista.org  
Scientific Name: *Echinocloa colona*  
Common Name: Bulang  
Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio  
Scientific Name: *Euphorbia heterophylla*  
Common Name: Poinsettia  
Habit: Shrub



© pfaf.org  
Scientific Name: *Euphorbia hirta*  
Common Name: Tawa-tawa  
Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio  
Scientific Name: *Eclipta alba*  
Common Name: Higis manok  
Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio  
Scientific Name: *Eichhornia crassipes*  
Common Name: Water Hyacinth  
Habit: Herb (Invasive Alien Species)



© Will Cook via carolinanature.com  
Scientific Name: *Elephantopus tomentosus*  
Common Name: Dilang baka  
Habit: Tree



© inaturalist.org  
Scientific Name: *Eragrostis tenella*  
Common Name: Japanese love grass  
Habit: Tree



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora



© public.asu.edu

Scientific Name: *Ficus benjamina*

Common Name: Benjamin Flag

Habit: Shrub



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Ficus septica*

Common Name: Hauli

Habit: Tree



© Anna via Flickr

Scientific Name: *Hevea brasiliensis*

Common Name: Rubber Tree

Habit: Tree



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Ipomoea batatas*

Common Name: Kamote

Habit: Vine



© knowledgebank.irri.org

Scientific Name: *Fimbristylis miliacea*

Common Name: Gumi

Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Hedyotis corymbosa*

Common Name: Starviolet

Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Ipomoea pes-tigridis*

Common Name: Malasandia

Habit: Vine



© Bruce Bohm via floridata.com

Scientific Name: *Ipomoea trilobata*

Common Name: Kamote

Habit: Vine



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Kyllingia monocephala*

Common Name: Mutha

Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Lemna minor*

Common Name: Duckweed

Habit: Herb



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Leucaena leucocephala*

Common Name: Ipil-ipil

Habit: Tree



© wildflower.org

Scientific Name: *Ludwigia octovalvis*

Common Name: Balakbak

Habit: Herb



© CSIRO via keys.trin.org.au

Scientific Name: *Mimosa pudica*

Common Name: Makahiya

Habit: Herb



© jatrophabiodisel.org

Scientific Name: *Moringa oleifera*

Common Name: Malunggay

Habit: Shrub



© calphotos.berkeley.edu

Scientific Name: *Manihot esculenta*

Common Name: Cassava

Habit: Shrub



© Cormack via cookislands.bishopmuseum.org

Scientific Name: *Mimosa invisa*

Common Name: Makahiya

Habit: Herb



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Pistia stratiotes*  
Common Name: Quiapo  
Habit: Herb



© slyviatramos.wordpress.com

Scientific Name: *Psidium guajava*  
Common Name: Guava  
Habit: Tree



© phytoimages.siu.edu

Scientific Name: *Muntigia calabura*  
Common Name: Aratiles  
Habit: Shrub



© buzzle.com

Scientific Name: *Musa sapientum*  
Common Name: Saging  
Habit: Herb



© lui.rig.altervista.org

Scientific Name: *Pterocarpus indica*  
Common Name: Narra  
Habit: Tree (Critically Endangered)



\*Photo by Ms. Ivy Amor F. Lambio

Scientific Name: *Saccharum spontaneum*  
Common Name: Talahib  
Habit: Herb



© Bruce Cook via tropicalforages.info

Scientific Name: *Panicum maximum*  
Common Name: Guinea grass  
Habit: Herb



© biolib.cz

Scientific Name: *Paspalidium flavidum*  
Common Name: Lisang kalabaw  
Habit: Herb



# V. Rapid Ecological Assessment Result: Valenzuela

## Flora



\*Photo by Ms. Ivy Amor F. Lambio  
Scientific Name: *Talinum triangulare*  
Common Name: Ginseng  
Habit: Herb



© biogeodb.sri.si.edu  
Scientific Name: *Terminalia catappa*  
Common Name: Talisay  
Habit: Tree



\*Photo by Ms. Ivy Amor F. Lambio  
Scientific Name: *Sida rhombifolia*  
Common Name: Eskobang haba  
Habit: Herb



© declaration.forestlegality.org  
Scientific Name: *Swietenia macrophylla*  
Common Name: Mahogany  
Habit: Tree



\*Photo by Ms. Ivy Amor F. Lambio  
Scientific Name: *Tridax procumbens*  
Common Name: White daisy  
Habit: Herb



© prota4u.org  
Scientific Name: *Vernonia cinerea*  
Common Name: Agas moro  
Habit: Herb



Photo by Ms. Ivy Amor F. Lambio  
Scientific Name: *Synedrella nodiflora*  
Common Name: Cinderella weed  
Habit: Herb



© rhs.org.uk  
Scientific Name: *Tagetes erecta*  
Common Name: Marigold  
Habit: Herb



# V. Rapid Ecological Assessment Result: Valenzuela

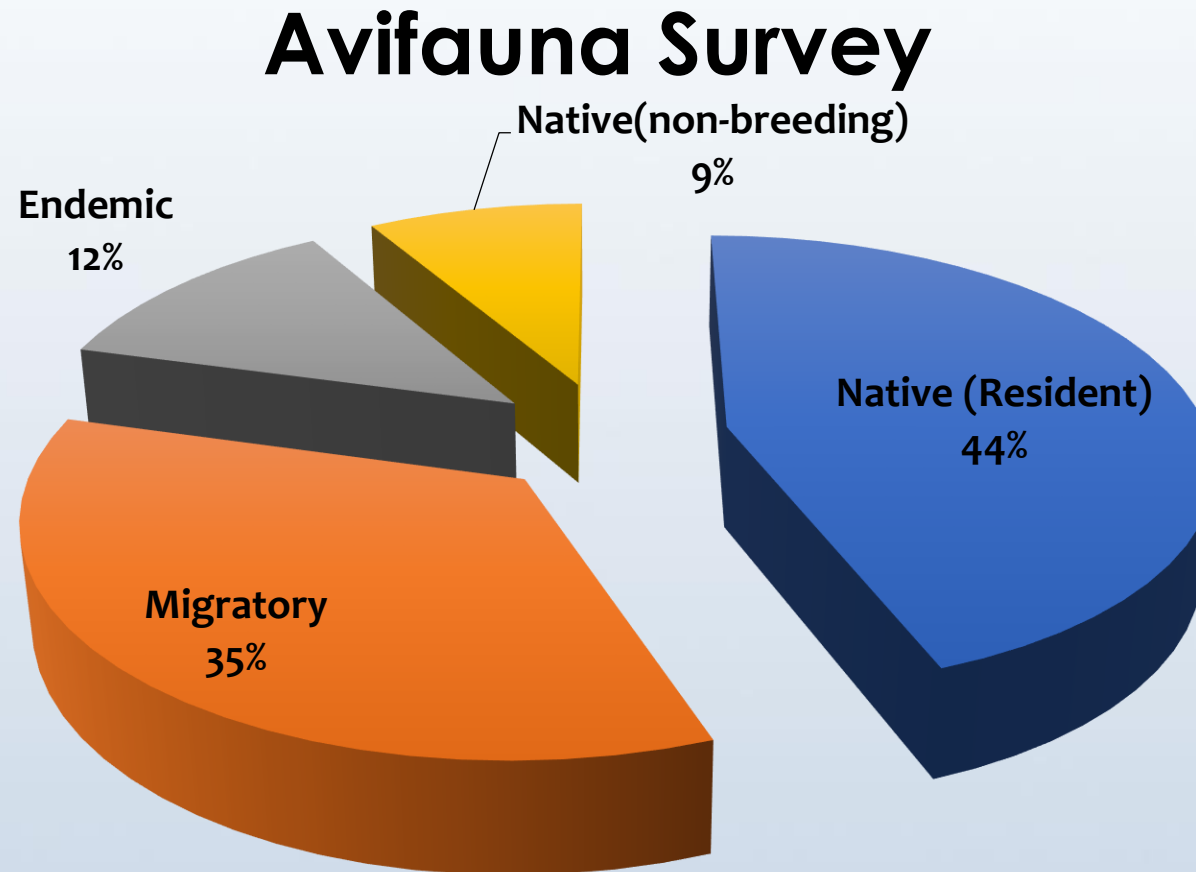
## Avifauna Survey

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# VI. Ecological Assessments Results: Valenzuela



# VI. Ecological Assessments Results: Valenzuela

## Avifauna

Diversity indices of avifauna recorded in the site using Fernando Biodiversity Index, 1998 (September 16, 2016 Survey)

| Index                  | Value  | Remarks   |
|------------------------|--------|-----------|
| Species Richness       | 30     |           |
| Shannon Diversity (H') | 2.771  | Moderate  |
| Shannon Evenness (J)   | 0.8148 | Very High |



# V. Rapid Ecological Assessment Result: Valenzuela

## Avifauna



© en.wikipedia.org

|  |   |
|--|---|
| Common Name  | Changeable Hawk-Eagle                     |
| Scientific Name  | <i>Nisus cirrhatus</i>                    |
| Family Name  | Accipitridae                              |
| Species Authority  | Gmelin, 1788                              |
| Distribution Status  | Native (Resident)                         |
| Conservation Status Current IUCN Red List Category   | Least Concern                             |
| Population Trend   | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 1   |
| Source: Birdlife International (2016). Species factsheet: <i>Nisus cirrhatus</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet.php?id=31546">http://www.birdlife.org/datazone/species/factsheet.php?id=31546</a> |   |



© common.wikimedia.org

|   |                                       |
|---|---------------------------------------|
| Common Name   | Olive-backed Sunbird                  |
| Scientific Name   | <i>Nectarinia jugularis</i>           |
| Family Name   | Nectariniidae                         |
| Species Authority   | Linnaeus, 1766                        |
| Distribution Status   | Native (Resident)                     |
| Conservation Status Current IUCN Red List Category  | Least Concern                         |
| Population Trend  | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 11                                    |
| Source: Birdlife International (2016). Species factsheet: <i>Nectarinia jugularis</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet.php?id=8276">http://www.birdlife.org/datazone/species/factsheet.php?id=8276</a> |                                       |



© Marcel Holyoak via Flickr

|   |                                       |
|---|---------------------------------------|
| Common Name   | Olive-backed Flowerpecker             |
| Scientific Name   | <i>Prionochilus olivaceus</i>         |
| Family Name   | Dicaeidae                             |
| Species Authority   | Tweeddale, 1877                       |
| Distribution Status   | Endemic                               |
| Conservation Status Current IUCN Red List Category  | Least Concern                         |
| Population Trend  | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 1                                     |
| Source: Birdlife International (2016). Species factsheet: <i>Prionochilus olivaceus</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22717451">http://www.birdlife.org/datazone/species/factsheet/22717451</a> |                                       |



© PD Round/The Wetland Trust via Oriental Bird Club

|   |   |
|---|---|
| Common Name   | Pygmy Flowerpecker                        |
| Scientific Name   | <i>Dicaeum pygmaeum</i>                   |
| Family Name   | Dicaeidae                                 |
| Species Authority   | Kittlitz, 1833                            |
| Distribution Status   | Endemic                                   |
| Conservation Status Current IUCN Red List Category  | Least Concern                             |
| Population Trend  | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 7   |
| Source: Birdlife International (2016). Species factsheet: <i>Dicaeum pygmaeum</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22717451">http://www.birdlife.org/datazone/species/factsheet/22717451</a> |   |

# V. Rapid Ecological Assessment Result: Valenzuela

## Avifauna



© botany.hawaii.edu

|   |                                       |
|---|---------------------------------------|
| Common Name   | Zebra Dove                            |
| Scientific Name   | <i>Geopelia striata</i>               |
| Family Name   | Columbidae                            |
| Species Authority   | Linnaeus, 1766                        |
| Distribution Status   | Native                                |
| Conservation Status Current IUCN Red List Category  | Least Concern                         |
| Population Trend  | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 15                                    |
| Source: Birdlife International (2016). <i>Species factsheet: Geopelia striata</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/speciesfactsheet.php?id=2548">http://www.birdlife.org/datazone/speciesfactsheet.php?id=2548</a> |                                       |



© hbc.co.uk

|   |                                       |
|---|---------------------------------------|
| Common Name   | Turtle Dove                           |
| Scientific Name   | <i>Streptopelia tranquebarica</i>     |
| Family Name   | Columbidae                            |
| Species Authority   | Hermann, 1804                         |
| Distribution Status   | Native                                |
| Conservation Status Current IUCN Red List Category  | Least Concern                         |
| Population Trend  | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 5                                     |
| Source: Birdlife International (2016). <i>Species factsheet: Streptopelia tranquebarica</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/speciesfactsheet.php?id=2507">http://www.birdlife.org/datazone/speciesfactsheet.php?id=2507</a> |                                       |



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|   |                                       |
|---|---------------------------------------|
| Common Name   | Brown Cuckoo-dove                     |
| Scientific Name   | <i>Macropygia phasianella</i>         |
| Family Name   | Columbidae                            |
| Species Authority   | Temminck, 1821                        |
| Distribution Status   | Endemic                               |
| Conservation Status Current IUCN Red List Category  | Least Concern                         |
| Population Trend  | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 1                                     |
| Source: Birdlife International (2016). <i>Species factsheet: Macropygia phasianella</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22690">http://www.birdlife.org/datazone/species/factsheet/22690</a> |                                       |



© Sunil Singhal via Oriental Bird Images

|  |   |
|--|---|
| Common Name  | Barred Buttonquail                        |
| Scientific Name  | <i>Turnix suscitator</i>                  |
| Family Name  | Turnicidae                                |
| Species Authority  | Gmelin, 1789                              |
| Distribution Status  | Native (resident)                         |
| Conservation Status Current IUCN Red List Category   | Least Concern                             |
| Population Trend   | Increasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 1   |
| Source: Birdlife International (2016). <i>Species factsheet: Turnix suscitator</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22680">http://www.birdlife.org/datazone/species/factsheet/22680</a> |   |



# V. Rapid Ecological Assessment Result: Valenzuela

## Avifaunal



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|  |                                       |
|--|---------------------------------------|
| Common Name  | Eurasian Tree Sparrow                 |
| Scientific Name  | <i>Passer montanus</i>                |
| Family Name  | Passeridae                            |
| Species Authority  | Linnaeus, 1758                        |
| Distribution Status  | Migratory                             |
| Conservation Status Current IUCN Red List Category   | Least Concern                         |
| Population Trend   | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 24                                    |
| Source: Birdlife International (2016). <i>Species factsheet: Passer montanus</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22718270">http://www.birdlife.org/datazone/species/factsheet/22718270</a> |                                       |



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|   |                                       |
|---|---------------------------------------|
| Common Name   | Cinnamon Bittern                      |
| Scientific Name   | <i>Ixobrychus cinnamomeus</i>         |
| Family Name   | Ardeidae                              |
| Species Authority   | Gmelin, 1789                          |
| Distribution Status   | Migratory                             |
| Conservation Status Current IUCN Red List Category  | Least Concern                         |
| Population Trend  | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 1                                     |
| Source: Birdlife International (2016). <i>Species factsheet: Ixobrychus cinnamomeus</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22697323">http://www.birdlife.org/datazone/species/factsheet/22697323</a> |                                       |



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|  |  |
|--|--|
| Common Name  | Yellow Bittern                         |
| Scientific Name  | <i>Ixobrychus sinensis</i>             |
| Family Name  | Ardeidae                               |
| Species Authority  | Gmelin, 1790                           |
| Distribution Status  | Migratory                              |
| Conservation Status Current IUCN Red List Category   | Least Concern                          |
| Population Trend   | Unknown (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 1                                      |
| Source: Birdlife International (2016). <i>Species factsheet: Ixobrychus sinensis</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet.php?id=3757">http://www.birdlife.org/datazone/species/factsheet.php?id=3757</a> |  |



© wildbirdgallery.com

|   |   |
|---|---|
| Common Name   | Little Egret                              |
| Scientific Name   | <i>Egretta garzetta</i>                   |
| Family Name   | Ardeidae                                  |
| Species Authority   | Linnaeus, 1766                            |
| Distribution Status   | Migratory                                 |
| Conservation Status Current IUCN Red List Category  | Least Concern                             |
| Population Trend  | Increasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 1   |
| Source: Birdlife International (2016). <i>Species factsheet: Egretta garzetta</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/62774969">http://www.birdlife.org/datazone/species/factsheet/62774969</a> |   |

# V. Rapid Ecological Assessment Result: Valenzuela

## Avifauna



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|   |   |
|---|---|
| Common Name   | Intermediate Egret                        |
| Scientific Name   | <del>Ardea intermedia</del>               |
| Family Name   | Ardeidae                                  |
| Species Authority   | <del>Wagler, 1829</del>                   |
| Distribution Status   | Migratory                                 |
| Conservation Status Current IUCN Red List Category  | Least Concern                             |
| Population Trend  | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 1   |
| Source: Birdlife International (2016). <i>Species factsheet: Ardea intermedia</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22727668">http://www.birdlife.org/datazone/species/factsheet/22727668</a> |   |



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|  |   |
|--|---|
| Common Name  | Black-crowned Night-heron                 |
| Scientific Name  | <del>Nycticorax nycticorax</del>          |
| Family Name  | Ardeidae                                  |
| Species Authority  | Linnaeus, 1758                            |
| Distribution Status  | Migratory                                 |
| Conservation Status Current IUCN Red List Category   | Least Concern                             |
| Population Trend   | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 1   |
| Source: Birdlife International (2016). <i>Species factsheet: Nycticorax nycticorax</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22697211">http://www.birdlife.org/datazone/species/factsheet/22697211</a> |   |



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|  |   |
|--|---|
| Common Name  | Barn Swallow                              |
| Scientific Name  | <del>Hirundo rustica</del>                |
| Family Name  | Hirundinidae                              |
| Species Authority  | Linnaeus, 1758                            |
| Distribution Status  | Migratory                                 |
| Conservation Status Current IUCN Red List Category   | Least Concern                             |
| Population Trend   | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 8   |
| Source: Birdlife International (2016). <i>Species factsheet: Hirundo rustica</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22712252">http://www.birdlife.org/datazone/species/factsheet/22712252</a> |   |



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|   |   |
|---|---|
| Common Name   | Pacific Swallow                           |
| Scientific Name   | <del>Hirundo tahitica</del>               |
| Family Name   | Hirundinidae                              |
| Species Authority   | <del>Gmelin, 1789</del>                   |
| Distribution Status   | Migratory                                 |
| Conservation Status Current IUCN Red List Category  | Least Concern                             |
| Population Trend  | Increasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 1   |
| Source: Birdlife International (2016). <i>Species factsheet: Hirundo tahitica</i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22712289">http://www.birdlife.org/datazone/species/factsheet/22712289</a> |   |



# V. Rapid Ecological Assessment Result: Valenzuela

## Avifauna



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|  |   |
|--|---|
| Common Name  | Yellow-vented Bulbul                      |
| Scientific Name                                    | <i>Pycnonotus goiavier</i>                |
| Family Name  | Pycnonotidae                              |
| Species Authority                                  | Scofield, 1786                            |
| Distribution Status                                | Native (Resident)                         |
| Conservation Status Current IUCN Red List Category | Least Concern                             |
| Population Trend                                   | Increasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 4   |

Source: Birdlife International (2016). *Species factsheet: Pycnonotus goiavier*. Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/2271273>



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|  |                                       |
|--|---------------------------------------|
| Common Name  | Common Moorhen                        |
| Scientific Name                                    | <i>Gallinula chloropus</i>            |
| Family Name  | Rallidae                              |
| Species Authority                                  | Linnaeus, 1758                        |
| Distribution Status                                | Migratory                             |
| Conservation Status Current IUCN Red List Category | Least Concern                         |
| Population Trend                                   | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 1                                     |

Source: Birdlife International (2016). *Species factsheet: Gallinula chloropus*. Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/62120190>



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|  |                                       |
|--|---------------------------------------|
| Common Name  | Pied Triller                          |
| Scientific Name                                    | <i>Lalage nigra</i>                   |
| Family Name  | Campephagidae                         |
| Species Authority                                  | Forster, 1781                         |
| Distribution Status                                | Native (Resident)                     |
| Conservation Status Current IUCN Red List Category | Least Concern                         |
| Population Trend                                   | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 1                                     |

Source: Birdlife International (2016). *Species factsheet: Lalage nigra*. Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/22706651>



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|  |                                       |
|--|---------------------------------------|
| Common Name  | Pied Fantail                          |
| Scientific Name                                    | <i>Rhipidura javanica</i>             |
| Family Name  | Cuculidae                             |
| Species Authority                                  | Sparman, 1788                         |
| Distribution Status                                | Native (Resident)                     |
| Conservation Status Current IUCN Red List Category | Least Concern                         |
| Population Trend                                   | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 2                                     |

Source: Birdlife International (2016). *Species factsheet: Rhipidura javanica*. Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/22706799>

# V. Rapid Ecological Assessment Result: Valenzuela

## Avifauna



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|  |   |
|--|---|
| Common Name  | White-collared Kingfisher                 |
| Scientific Name  | <del>Halcyon chloris</del>                |
| Family Name  | <del>Rhiniduridae</del>                   |
| Species Authority  | <del>Boddaert, 1783</del>                 |
| Distribution Status  | Native (Resident)                         |
| Conservation Status Current IUCN Red List Category   | Least Concern                             |
| Population Trend   | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 7   |
| Source: <del>Birdlife</del> International (2016). <i>Species factsheet: <del>Jodichromus chloris</del></i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22683399">http://www.birdlife.org/datazone/species/factsheet/22683399</a> |   |



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|  |  |
|--|--|
| Common Name  | Common Kingfisher                      |
| Scientific Name  | <del>Alcedo atthis</del>               |
| Family Name  | <del>Alcedinidae</del>                 |
| Species Authority  | Linnaeus, 1758                         |
| Distribution Status  | Migratory                              |
| Conservation Status Current IUCN Red List Category   | Least Concern                          |
| Population Trend   | Unknown (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 1                                      |
| Source: <del>Birdlife</del> International (2016). <i>Species factsheet: <del>Alcedo atthis</del></i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22683399">http://www.birdlife.org/datazone/species/factsheet/22683399</a> |  |



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|  |  |
|--|--|
| Common Name  | <del>Striated Grassbird</del>          |
| Scientific Name  | <del>Megalurys palustris</del>         |
| Family Name  | <del>Sylviidae</del>                   |
| Species Authority  | <del>Horsfield, 1821</del>             |
| Distribution Status  | Native (Resident)                      |
| Conservation Status Current IUCN Red List Category   | Least Concern                          |
| Population Trend   | Unknown (Birdlife International, 2016) |
| Count (Valenzuela Depot)   | 2                                      |
| Source: <del>Birdlife</del> International (2016). <i>Species factsheet: <del>Megalurys palustris</del></i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22715494">http://www.birdlife.org/datazone/species/factsheet/22715494</a> |  |



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|   |   |
|---|---|
| Common Name   | Brown Shrike                              |
| Scientific Name   | <del>Lanius cristatus</del>               |
| Family Name   | <del>Laniidae</del>                       |
| Species Authority   | Linnaeus, 1758                            |
| Distribution Status   | Native (Non-breeding)                     |
| Conservation Status Current IUCN Red List Category  | Least Concern                             |
| Population Trend  | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)  | 7   |
| Source: <del>Birdlife</del> International (2016). <i>Species factsheet: <del>Lanius cristatus</del></i> . Retrieved October 13, 2016 from <a href="http://www.birdlife.org/datazone/species/factsheet/22705011">http://www.birdlife.org/datazone/species/factsheet/22705011</a> |   |



# V. Rapid Ecological Assessment Result:

## Valenzuela

### Avifauna



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| Common Name  | Greater Painted-snipe                     |
|--|---|
| Scientific Name                                    | <i>Rostratula benghalensis</i>            |
| Family Name  | Rostratulidae                             |
| Species Authority                                  | Linnaeus, 1759                            |
| Distribution Status                                | Native (Resident)                         |
| Conservation Status Current IUCN Red List Category | Least Concern                             |
| Population Trend                                   | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 1   |

Source: [Birdlife International \(2016\). Species factsheet: Rostratula benghalensis](http://www.birdlife.org/datazone/species/factsheet/22735). Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/22735>



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| Common Name  | Asian Glossy Starling                  |
|--|--|
| Scientific Name                                    | <i>Aplonis panayensis</i>              |
| Family Name  | Sturnidae                              |
| Species Authority                                  | Scofield, 1783                         |
| Distribution Status                                | Native (Resident)                      |
| Conservation Status Current IUCN Red List Category | Least Concern                          |
| Population Trend                                   | Unknown (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 14                                     |

Source: [Birdlife International \(2016\). Species factsheet: Aplonis panayensis](http://www.birdlife.org/datazone/species/factsheet/22710). Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/22710>



© en.wikipedia.org

| Common Name  | Chestnut Munia                        |
|--|---------------------------------------|
| Scientific Name                                    | <i>Lonchura atricapilla</i>           |
| Family Name  | Estrildidae                           |
| Species Authority                                  | Vieillot, 1807                        |
| Distribution Status                                | Native (Resident)                     |
| Conservation Status Current IUCN Red List Category | Least Concern                         |
| Population Trend                                   | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 1                                     |

Source: [Birdlife International \(2016\). Species factsheet: Lonchura atricapilla](http://www.birdlife.org/datazone/species/factsheet/22729). Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/22729>



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| Common Name  | Blue-tailed Bee-eater                 |
|--|---------------------------------------|
| Scientific Name                                    | <i>Mexops philippinus</i>             |
| Family Name  | Maxopidae                             |
| Species Authority                                  | Linnaeus, 1766                        |
| Distribution Status                                | Migratory                             |
| Conservation Status Current IUCN Red List Category | Least Concern                         |
| Population Trend                                   | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 1                                     |

Source: [Birdlife International \(2016\). Species factsheet: Mexops philippinus](http://www.birdlife.org/datazone/species/factsheet/22683). Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/22683>



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| Common Name  | Common Snipe                              |
|--|---|
| Scientific Name                                    | <i>Gallinago gallinago</i>                |
| Family Name  | Scolopacidae                              |
| Species Authority                                  | Linnaeus, 1758                            |
| Distribution Status                                | Migratory                                 |
| Conservation Status Current IUCN Red List Category | Least Concern                             |
| Population Trend                                   | Decreasing (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 1   |

Source: [Birdlife International \(2016\). Species factsheet: Gallinago gallinago](http://www.birdlife.org/datazone/species/factsheet/22693). Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/22693>



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| Common Name  | Philippine Pygmy Woodpecker           |
|--|---------------------------------------|
| Scientific Name                                    | <i>Picoides maculatus</i>             |
| Family Name  | Picidae                               |
| Species Authority                                  | Scofield, 1786                        |
| Distribution Status                                | Endemic                               |
| Conservation Status Current IUCN Red List Category | Least Concern                         |
| Population Trend                                   | Stable (Birdlife International, 2016) |
| Count (Valenzuela Depot)                           | 1                                     |

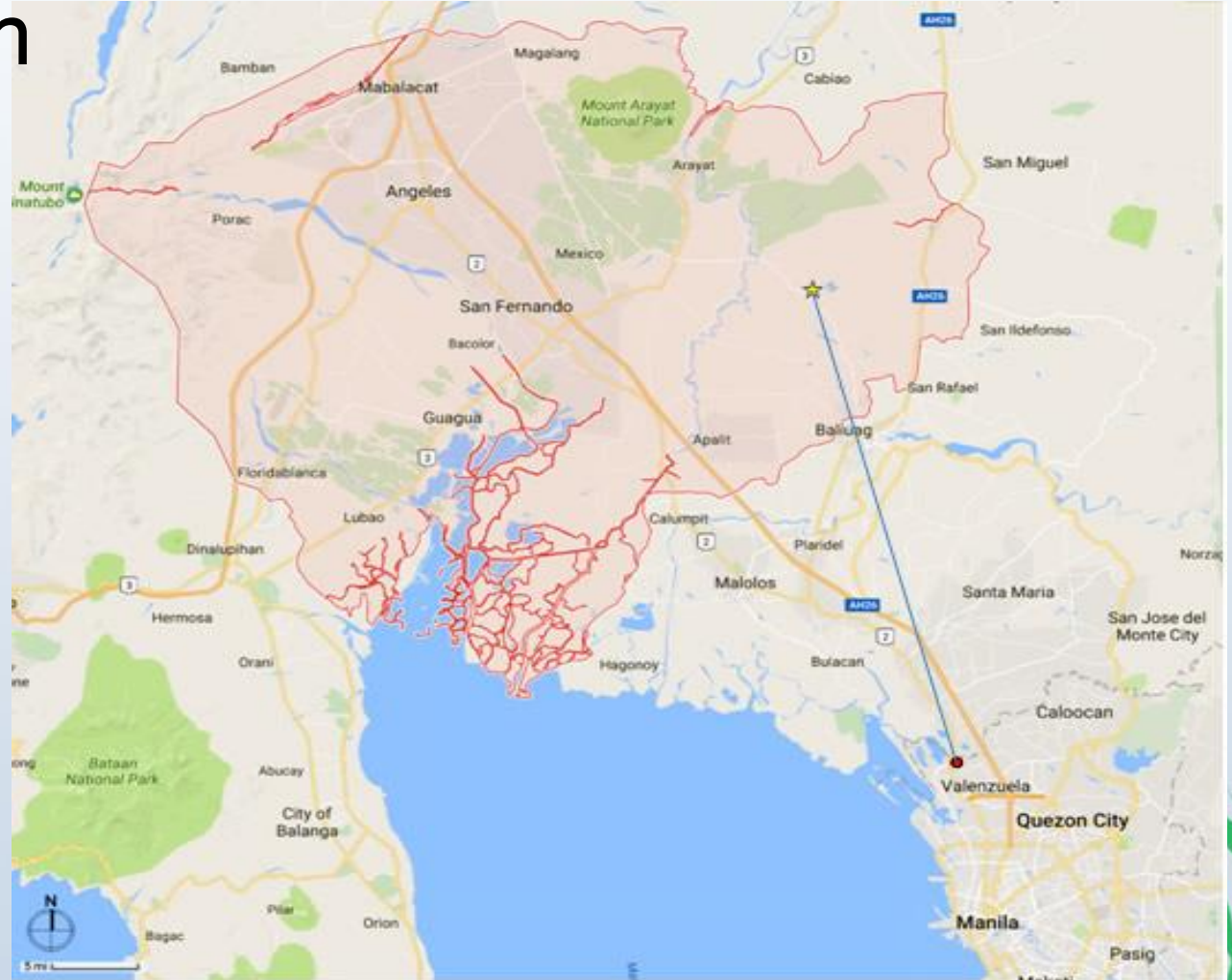
Source: [Birdlife International \(2016\). Species factsheet: Picoides maculatus](http://www.birdlife.org/datazone/species/factsheet/22681). Retrieved October 13, 2016 from <http://www.birdlife.org/datazone/species/factsheet/22681>



# VI. Ecological Assessments Results: *Paligui*

## Area, Boundary, and Dimension

The offset site is located approximately 50 km north of Manila by the Pan-Philippine Highway and is on the eastern portion of Pampanga province .





# VI. Ecological Assessments Results: *Paligui*

## Area, Boundary, and Dimension

- 132 hectares of farm land in Barangay Paligui, Candaba, Pampanga,
- Owned and managed by Macagatal Irrigators Association (MIA).

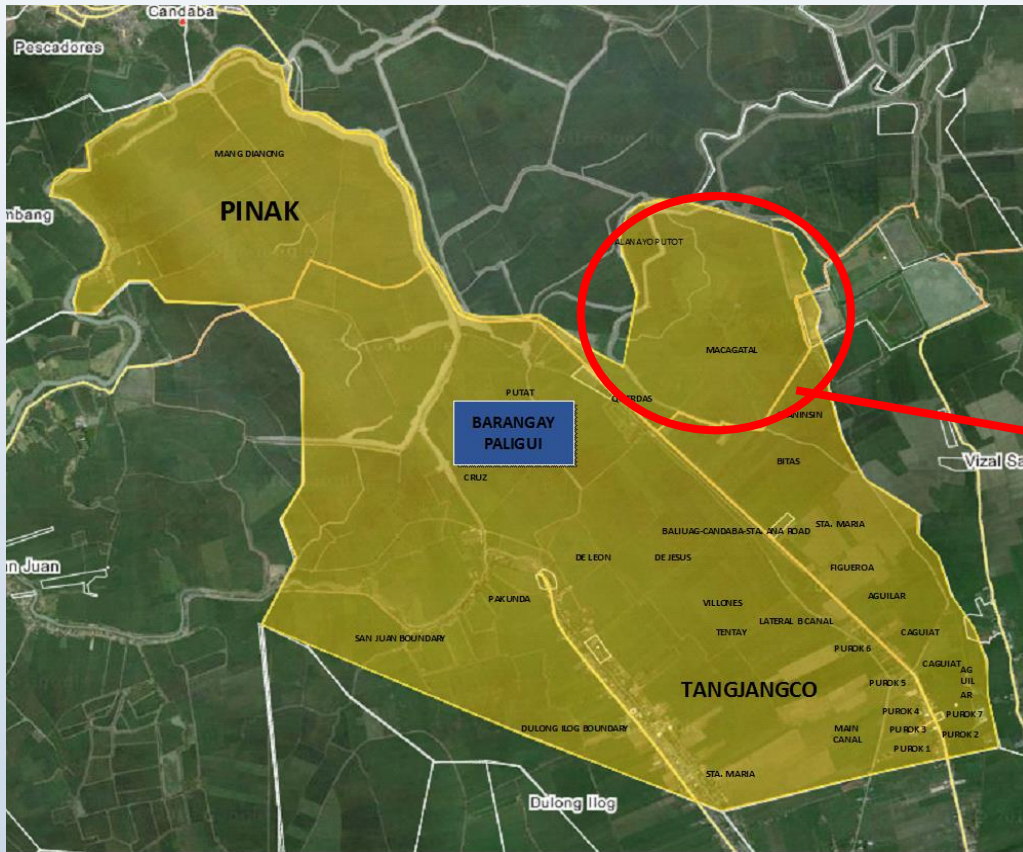


Image source: Brgy. Paligui Hazard Map, 2017

# VI. Ecological Assessments Results: *Paligui*

## Area, Boundary, and Dimension

- 15 hectares of contiguous farm land situated on the eastern portion of the MIA land
- Adjacent to the locally-declared bird sanctuary owned by the former Municipal Mayor of Candaba, Pampanga





# VI. Ecological Assessments Results: *Paligui*

## Climate Conditions



- Wet season - late May and around end of October
- Dry season - November to April
- Amount of rainfall - a monthly average of 139.3 inches, which is estimated to be 90 inches in annual basis.
- Temperature - 25.8 degrees centigrade and 26.0 degrees centigrade
- Coldest months - January and February.

# VI. Ecological Assessments Results: *Paligui*

## Water Quality

| Parameter                                | Station 1 | Station 2 | Mean Value |
|--|-----------|-----------|------------|
| Temperature (°C)                         | 26.81     | 27.01     | 26.91      |
| pH                                       | 5.52      | 5.28      | 5.4        |
| Total Dissolved Solids (TDS) (g/L)       | 0.224     | 0.231     | 0.2275     |
| Dissolved Oxygen (DO) (mg/L)             | 2.66      | 2.89      | 2.775      |
| Oxidation Reduction Potential (ORP) (mV) | 213       | 248       | 230.5      |
| Salinity (ppt)                           | 0.2       | 0.2       | 0.2        |
| Turbidity (NTU)                          | 131       | 128       | 129.5      |
| Conductivity (mS/cm)                     | 0.335     | 0.356     | 0.3445     |

Results of water analysis in two stations at Candaba Marsh, Candaba, Pampanga using HORIBA Multi-Parameter Water Quality Checker. (January 31, 2017).



# VI. Ecological Assessments Results: *Paligui*

## Flora

Scientific Name: *Alternanthera sessilis*  
Common Name: Bunga bunga



©Chris Parker/Bristol, UK

Scientific Name: *Cardiospermum halicacabum*  
Common Name: Balloon plant



© Prof. Ivy Amor Lambio

Scientific Name: *Chromolaena odorata*  
Common Name:



© Baya lucidcentral.org

Scientific Name: *Echinochloa colona*  
Common Name: Jungle rice



© commons.wikimedia.org

Scientific Name: *Citrullus lanatus*  
Common Name: Watermelon



©Hortipedia

Scientific Name: *Cynodon dactylon*  
Common Name: Bermuda grass



© missouriplants.com

Scientific Name: *Eclipta alba*  
Common Name:



© 101herbs.com

Scientific Name: *Gliricidia septum*  
Common Name:



©ctahr.hawaii.edu



# VI. Ecological Assessments Results: *Paligui*

## Flora

Scientific Name: *Eichhornia crassipes*  
Common Name: Water Hyacinth



© PlantRight.org

Scientific Name: *Ipomoea aquatica*  
Common Name:



© portal.wikio.org

Scientific Name: *Pithecellobium dulce*  
Common Name: Camachile



© Tela-botanica.org

Scientific Name: *Synedrella nodiflora*  
Common Name:



© Virtual Botanic Garden

Scientific Name: *Ipomoea triloba* L.  
Common Name:



©Virtual Botanic Garden

Scientific Name: *Lantana camara* L.  
Common Name: Sapinit



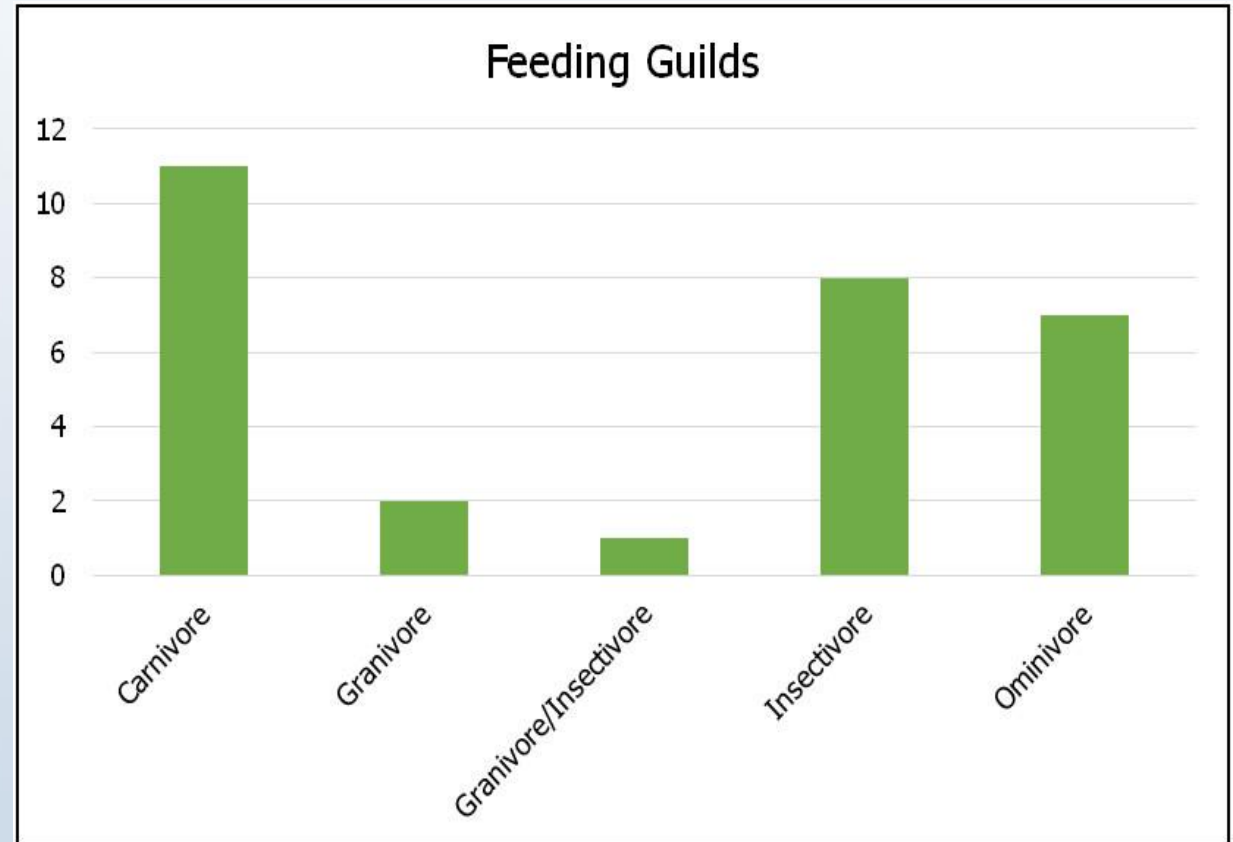
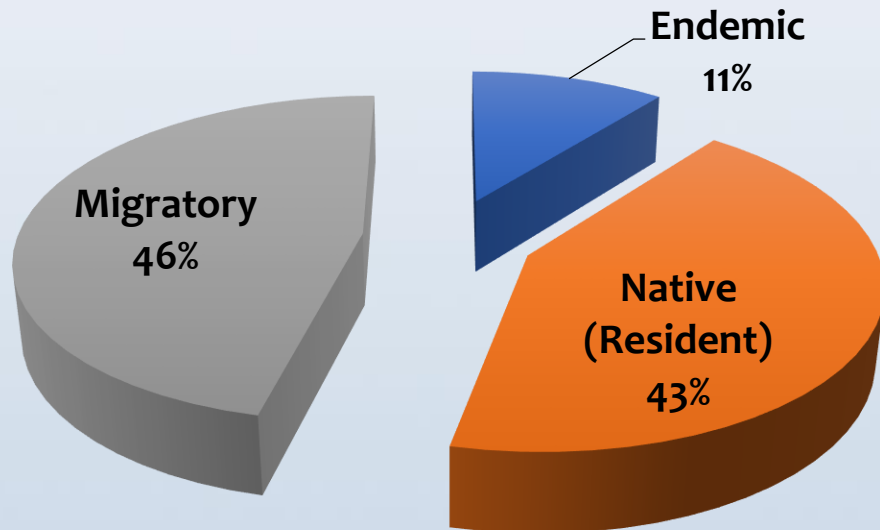
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# VI. Ecological Assessments Results: *Paligui*

## Avifauna

### Species Distribution of Avifauna Species



# VI. Ecological Assessments Results: *Paligui*

## Avifauna

Diversity indices of birds recorded at the offset site (January 2017)

| Index                  | Value  | Remarks  |
|------------------------|--------|----------|
| Shannon Diversity (H') | 2.54   | Moderate |
| Shannon Evenness (E)   | 0.4372 | Moderate |
| Species Richness       | 29     |          |



# VI. Ecological Assessments Results: *Paligui*

## Avifauna

Family Name: Estrildidae  
Distribution Status: Native (Resident)



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Scientific Name: *Rhipidura nigritorquis*  
Common Name: Philippine Pied Fantail  
Family Name: Rhipiduridae  
Distribution Status: Endemic



© orientalbirdimages.org

Scientific Name: *Geopelia striata*  
Common Name: Zebra dove  
Family Name: Columbidae  
Distribution Status: Native (Resident)



©University of Hawaii Botany

Scientific Name: *Passer montanus*  
Common Name: Eurasian Tree Sparrow  
Family Name: Passeridae  
Distribution Status: Native (Resident)



©Ales Pragr

Scientific Name: *Ixobrychus cinnamomeus*  
Common Name: Cinnamon Bittern  
Family Name: Ardeidae  
Distribution Status: Migratory



© Dr. Raju Kasambe via wikimedia commons

Scientific Name: *Streptopelia chinensis*  
Common Name: Spotted dove  
Family Name: Columbidae  
Distribution Status: Native (Resident)



©University of Hawaii Botany

Scientific Name: *Botaurus stellans*  
Common Name: Eurasian Bittern  
Family Name: Ardeidae  
Distribution Status: Migratory



© commons.wikimedia.org

Scientific Name: *Egretta garzetta*  
Common Name: Little Egret  
Family Name: Ardeidae  
Distribution Status: Migratory



© commons.wikimedia.org

Scientific Name: *Ardea intermedia*  
Common Name: Intermediate Egret  
Family Name: Ardeidae  
Distribution Status: Migratory



© barraimaging.com.au

Scientific Name: *Bubulcus ibis*  
Common Name: Cattle Egret  
Family Name: Ardeidae  
Distribution Status: Migratory



© botanyhawaii.edu

Scientific Name: *Ardea purpurea*  
Common Name: Purple heron  
Family Name: Ardeidae  
Distribution Status: Migratory



© biodiversityexplorer.org

Scientific Name: *Ardea Alba*  
Common Name: Great Egret  
Family Name: Ardeidae  
Distribution Status: Migratory



© commons.wikimedia.org

Scientific Name: *Nycticorax nycticorax*  
Common Name: Black-crowned Night-Heron  
Family Name: Ardeidae  
Distribution Status: Migratory



© neotropical birds cornell.edu

Scientific Name: *Ardea cinerea*  
Common Name: Grey Heron  
Family Name: Ardeidae  
Distribution Status: Migratory



© commons.wikimedia.org



# VI. Ecological Assessments Results: *Paligui*

## Avifauna

Scientific Name: *Chlidonias hybrida*  
Common Name: Whiskered Tern  
Family Name: Laridae  
Distribution Status: Migratory



©Christophe Perelle via arkive.org

Scientific Name: *Turnix suluensis*  
Common Name: Barred Buttonquail  
Family Name: Turnicidae  
Distribution Status: Native (Resident)



orientalbirdimages.org ©

Scientific Name: *Hirundo rustica*  
Common Name: Barn Swallow  
Family Name: Hirundinidae  
Distribution Status: Migratory



© GBIF.org

Scientific Name: *Porphyrio porphyrio*  
Common Name: Purple Swamphen  
Family Name: Rallidae  
Distribution Status: Native (Resident)



© Martin Polacek via IUCN.org

Scientific Name: *Centropus viridis*  
Common Name: Philippine Coucal  
Family Name: Cuculidae  
Distribution Status: Endemic



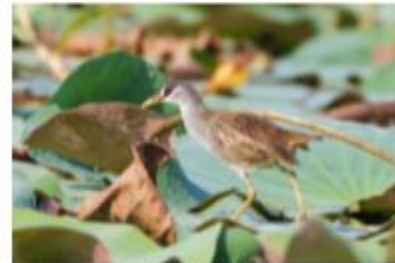
©manilaoldtimer.net

Scientific Name: *Hirundo tahitica*  
Common Name: Pacific Swallow  
Family Name: Hirundinidae  
Distribution Status: Migratory



© HBW.com

Scientific Name: *Amauromantis cinerea*  
Common Name: White-browed Crake  
Family Name: Rallidae  
Distribution Status: Native (Resident)



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Scientific Name: *Acrocephalus stentoreus*  
Common Name: Clamorous Reed-Warbler  
Family Name: Acrocephalidae  
Distribution Status: Native (Resident)



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Scientific Name: *Cincloramphus timoniensis*  
Common Name: Tawny Grassbird  
Family Name: Locustellidae  
Distribution Status: Native (Resident)



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Scientific Name: *Dendrocygna arcuata*  
Common Name: Wandering Whistling Duck  
Family Name: Anatidae  
Distribution Status: Native (Resident)



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Scientific Name: *Aythya fuligula*  
Common Name: Tufted Duck  
Family Name: Anatidae  
Distribution Status: Migratory



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Scientific Name: *Megalurus palustris*  
Common Name: Striated Grassbird  
Family Name: Locustellidae  
Distribution Status: Native (Resident)



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Scientific Name: *Anas luzonica*  
Common Name: Philippine Duck  
Family Name: Anatidae  
Distribution Status: Endemic



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Scientific Name: *Lanius cristatus*  
Common Name: Brown shrike  
Family Name: Laniidae  
Distribution Status: Native (Resident)



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# VI. Ecological Assessments Results: *Paligui*

## Wetland Benefits (Ecosystems Services)

### Provisioning Services

- Rice
- Habitat for species
- Freshwater
- Fibre

### Regulating Services

- Local climate regulation
- Water regulation
- Flood hazard regulation

### Supporting Services

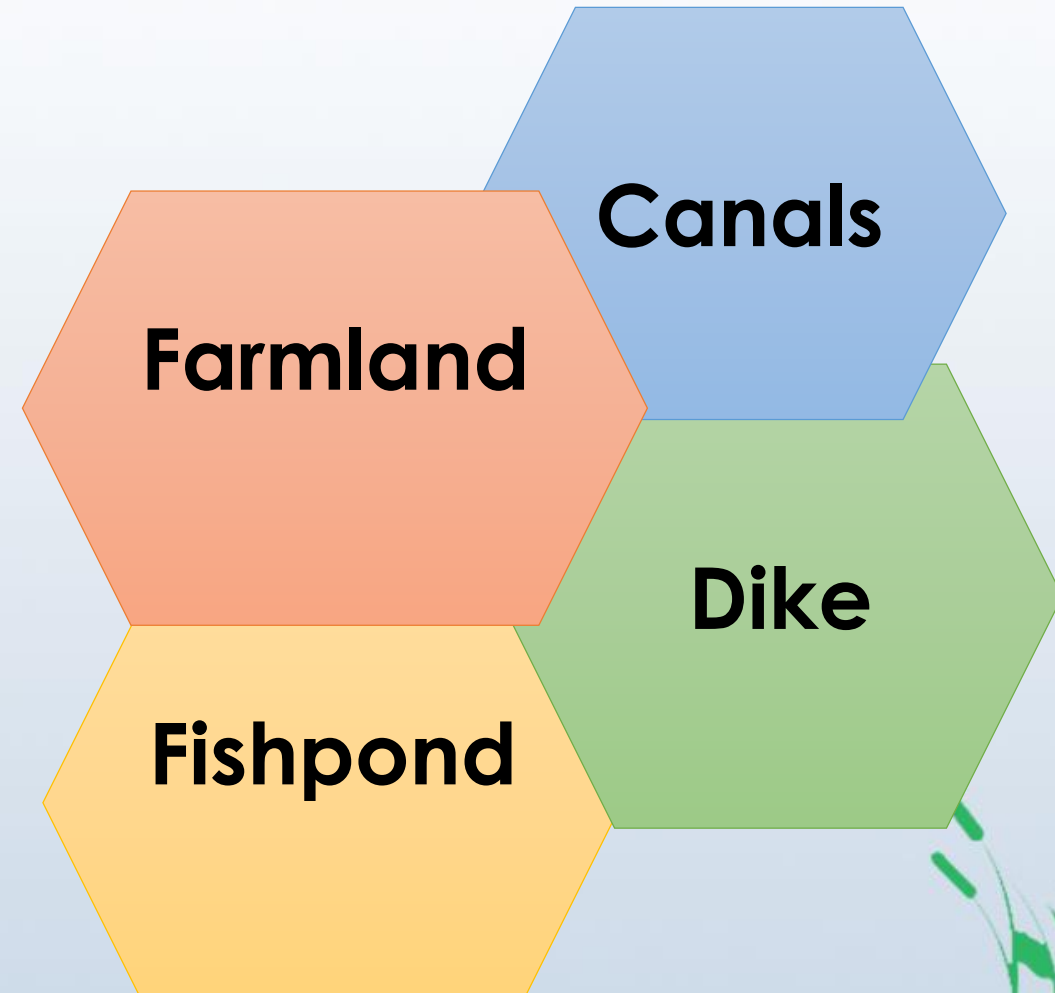
- Soil Formation
- Primary Production
- Nutrient cycling
- Water recycling

### Cultural Services

- Showcasing traditional farming
- Aesthetic value
- Ecotourism
- Research and Education

# VI. Ecological Assessments Results: *Paligui*

## Land Use





## VII. Conclusion (Ramsar, 2012)

**“According to the Millennium Ecosystem Assessment reports - inland water, coastal and near-shore marine ecosystems include the most threatened of the world’s main habitat types.**

**Thus, we need more information to be able to manage these systems better. The urgency of biodiversity decline means that such information needs to be obtained quickly, using credible methods applied efficiently and effectively.”**

## VII. Conclusion (Ramsar, 2012)

**“‘Avoidance’ of wetlands loss should be the priority and ‘compensation’ should be the last resort measure.”**



## VII. Conclusion (Ramsar, 2012)

**“Wetlands offsets are required in order to facilitate sustainable management of water resources and attain biodiversity targets while at the same time allowing for future development.”**

## VII. Conclusion (Ramsar, 2012)

**“It is preferable to compensate for wetland loss with wetlands of a similar type and in the same local water catchment and priority should be given to on-site compensation.”**



# THANK YOU 😊

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