

# Introduction of basic waterbird monitoring



©David Li



*David Li*  
**Conservation Manager, Sungei Buloh Wetland Reserve**  
**National Parks Board Singapore**



# Why monitor waterbirds?

Waterbirds are very important components of wetland biodiversity.

- Attract people's interest on wetlands conservation;
- A flagship group and an indicator for wetland monitoring and conservation.



©David Li





# Objectives of waterbird monitoring



Identify wetland sites that are important for migrants and resident waterbirds



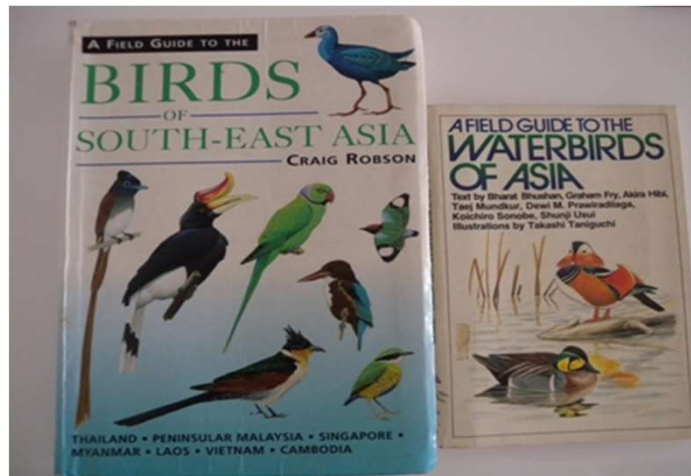
Assess waterbird numbers and species using each sites



Identify the main periods of site usage by waterbirds

# Preparing for waterbird surveys

## - Equipment



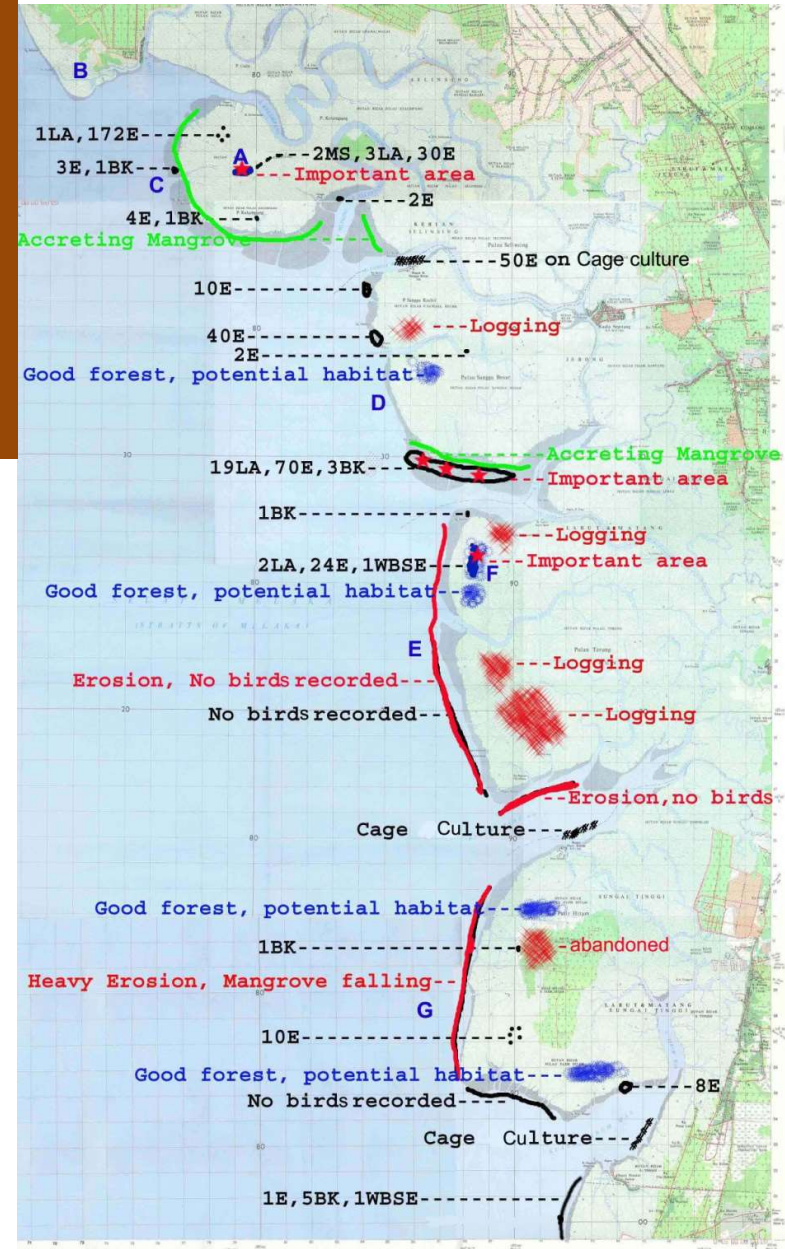
- Binoculars
- Scope
- Field guide/Bird chart
- Notebook & Stationery
- Bird Recording Sheet



# Preparing for waterbird surveys

## - Map

- Help to understand the study area, land uses and habitat types.
- To set boundary of the area to be surveyed.
- To decide how to gain access to the site and how to survey it.
- Help to identify where the major concentration of waterbirds are located for survey.



Matang Mangrove Forest, Perak

# Map of Sungei Buloh Wetland Reserve





# Preparing for waterbird surveys

## - Tide Table

- For surveys in coastal areas, it's important to study the tide table before the survey.
- Tide tables needed to be studied to see if foot, boat, aerial or other survey techniques are applicable, also to see whether feeding areas or roost sites will be surveyed.
- During low tide, waterbirds scatter over a large area to feed. Thus they are difficult to approach, and it is time consuming to identify and count them.
- When the tide is “coming in” or “going out” waterbirds will be more concentrated.
- The other way is to find out the high tide roost site of the waterbird and conduct the surveys at the roost sites during high tide.

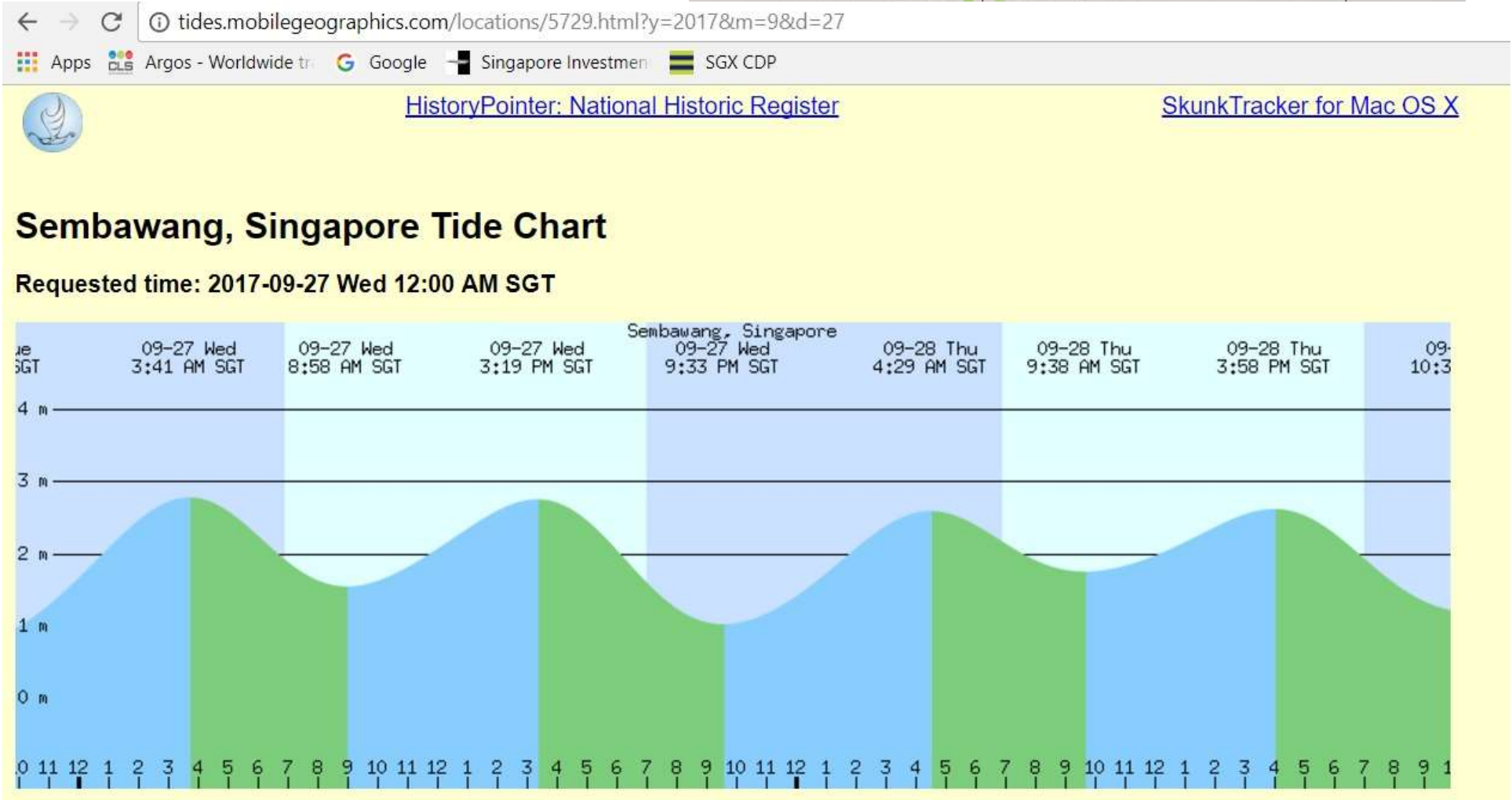
Tide tables are often available online or can be purchased easily.

APRIL 2017

HOURLY TIDAL HEIGHTS

HEIGHTS IN METRES  
**SEMBAWANG**  
LAT 01° 27.9'N LONG 103° 50.1'E

DAY\HR	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	2.4	2.9	3.2	3.1	2.6	1.9	1.1	0.5	0.2	0.4	0.9	1.4	2.0	2.6	3.1	3.2	3.1	2.6	2.0	1.4	0.9	0.9	1.3	1.7
2	2.2	2.6	3.0	3.1	2.9	2.3	1.6	0.9	0.4	0.3	0.5	0.9	1.4	2.0	2.6	2.9	3.0	2.9	2.5	1.9	1.4	1.1	1.2	1.5
3	1.9	2.3	2.7	3.0	3.0	2.7	2.1	1.5	0.9	0.5	0.4	0.6	1.0	1.4	2.0	2.4	2.7	2.8	2.7	2.4	2.0	1.6	1.4	1.5
4	1.7	2.0	2.4	2.7	2.8	2.8	2.5	2.0	1.5	1.0	0.7	0.6	0.7	1.0	1.4	1.8	2.2	2.5	2.6	2.6	2.4	2.1	1.8	1.6
5	1.7	1.8	2.0	2.3	2.5	2.6	2.6	2.4	2.1	1.6	1.2	0.9	0.8	0.8	1.0	1.3	1.7	2.0	2.3	2.5	2.6	2.5	2.3	2.0





# Waterbird survey

## Ground survey

### Advantages :

- Easy to organize and cheap to do
- Can be conducted by one person
- Enables the surveyor to spend longer studying individual birds and counting flocks, therefore counts and identification are more accurate

### Disadvantages :

- Only relatively small area can be covered during one day
- Access on foot is not possible in some wetlands
- Birds may be disturbed if approached too closely on foot

### Important notes:

- The observer must be a sufficient distance from the birds so as not to disturb them
- Should avoid walking directly towards flocks of birds as this may make them fly
- Better to have the sun behind the observer
- Must remain quiet and avoid quick or sudden movement



# Boat survey

## Advantage:

- Boat survey is a very useful method for waterbird survey, particularly when the areas are inaccessible by foot.
- Relatively large distance can be covered in a short space of time
- Boats can be easily organised by hiring from a local fisherman
- When surveying coastlines the water edge can often be approached closer than during ground survey

## Disadvantage:

- Boats are unstable viewing platforms
- Boat move slower than birds, hence there is a risk of multiple counting if birds fly away.
- Boat can not be used effectively in tough weather
- Using boats can be heavily dependent on the tide conditions





# Aerial Survey

Aerial surveys have been used worldwide to identify key sites for waterbirds, to evaluate bird numbers, to map vegetation and identify threats to habitats.

## Advantage:

- Large distance can be covered in a short space of time
- A lot of information on waterbirds and habitat can be gathered during a single survey
- Important area can be quickly identified on which the effort for follow up ground survey can be focused

## Disadvantage:

- Expensive and often logistically difficult to organise.
- Extensive pre-flight planning is necessary with regards to route, legal height limits, air space restriction, etc
- Degree of accuracy of identification and count may be lower than other methods



*Using drone as alternative of Aerial survey has been assessed these days.*

# WHAT SPECIES?





# WHAT SPECIES?



# WHAT SPECIES?



# WHAT SPECIES?





# WHAT SPECIES?



© David Li





# Shorebirds of SBWR: 9 Common Species



1. Pacific Golden Plover



2. Lesser Sand Plover



3. Whimbrel



4. Common Redshank



5. Common Greenshank



6. Marsh Sandpiper



7. Common Sandpiper



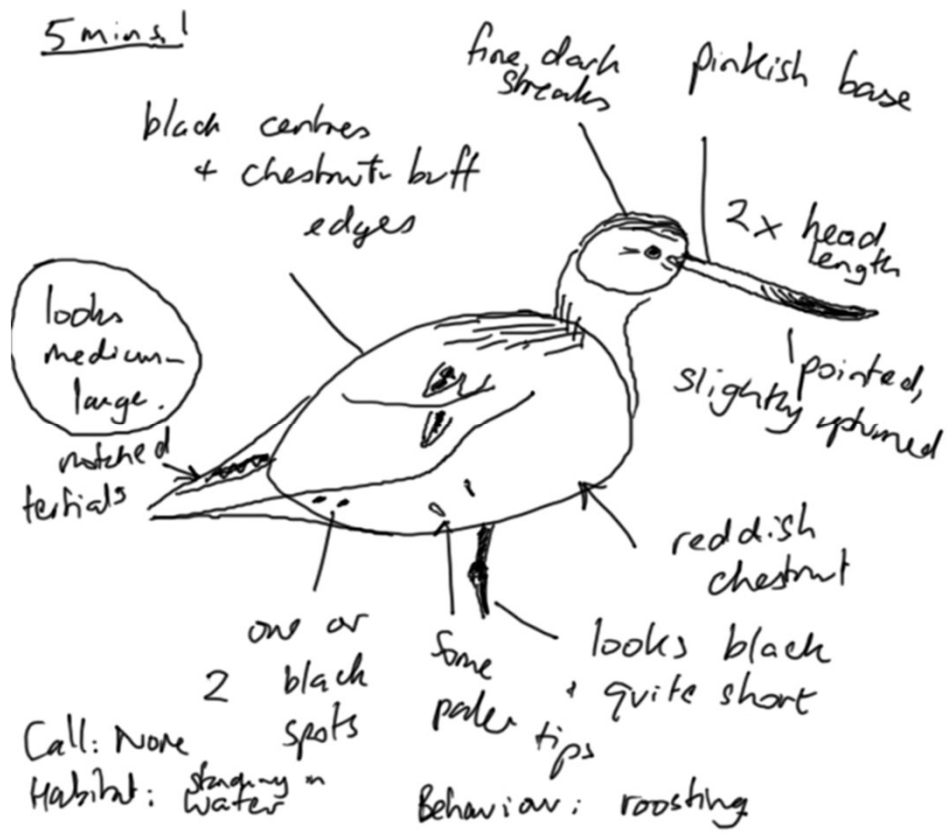
8. Curlew Sandpiper



9. Terek Sandpiper

# Shorebird Identification Skills

- Within a flock, choose one bird to study
- Choose a bird that is as close as possible
- Spend some time looking at it
- Study it and write down as much as you can, taking notes of specific traits
- If possible, do a quick sketch



Bar-tailed godwit

**How to sketch a bird**

**Step 1**  
Draw two egg shapes for head and body

**Step 2**  
Join the head to body with 2 curved lines. Draw in the bill and eye

**Step 3**  
Draw 2 triangles and a curve for wings. Then draw the legs

Howes, J., Bakewell, D. (1989). Shorebird Studies Manual. AWB Publication No. 55. Kuala Lumpur.



# What to look out for

- Body Size and Shape
- Colour and patterns
- Bill shape and length
- Leg length and colour
- Feeding and Movement Behaviour
- Flight pattern
- Flocking
- Habitat
- Season
- Call



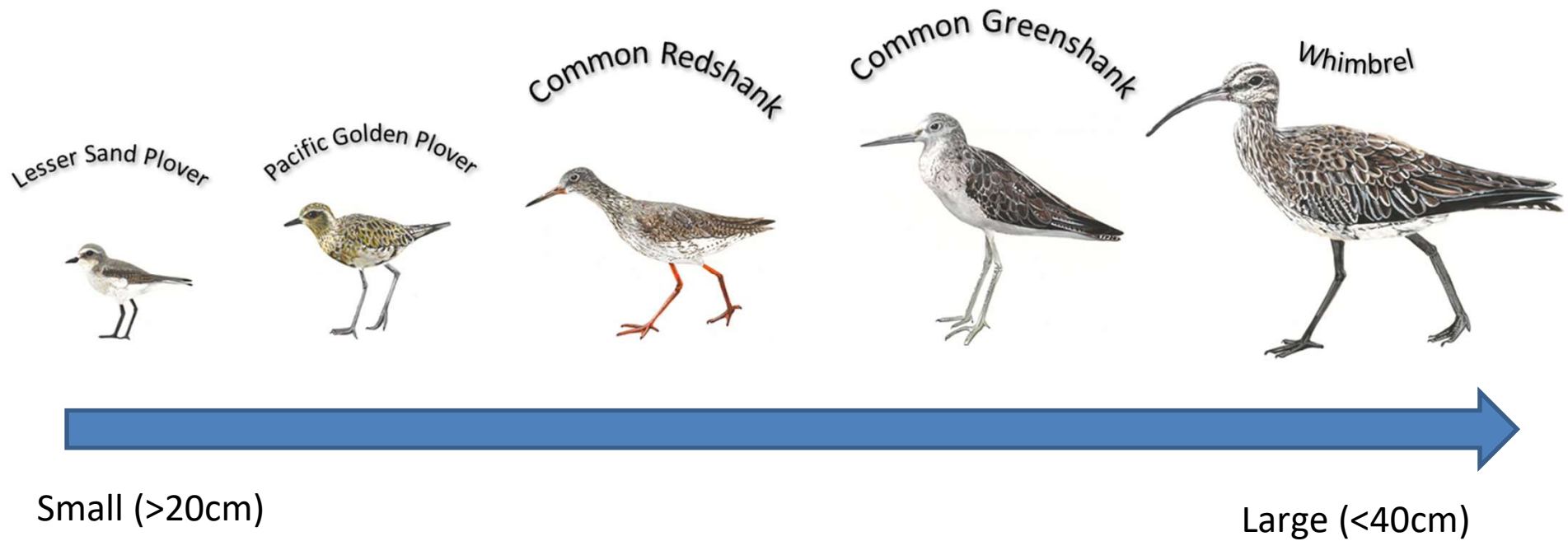
©David Li



©David Li



# Size Comparison



Pacific Golden Plover

Lesser Sand Plover

Common Redshank

Common Greenshank

Whimbrel



# Bill Variety

## **Identification problems**

Sexual differences

Age differences

Geographical differences

Seasonal differences

Introduced/escapee

Hybrid



# How to count waders?

One by one if there are not many birds (< 200)



©David Li

# How to count waders?

Species by species if you are counting alone

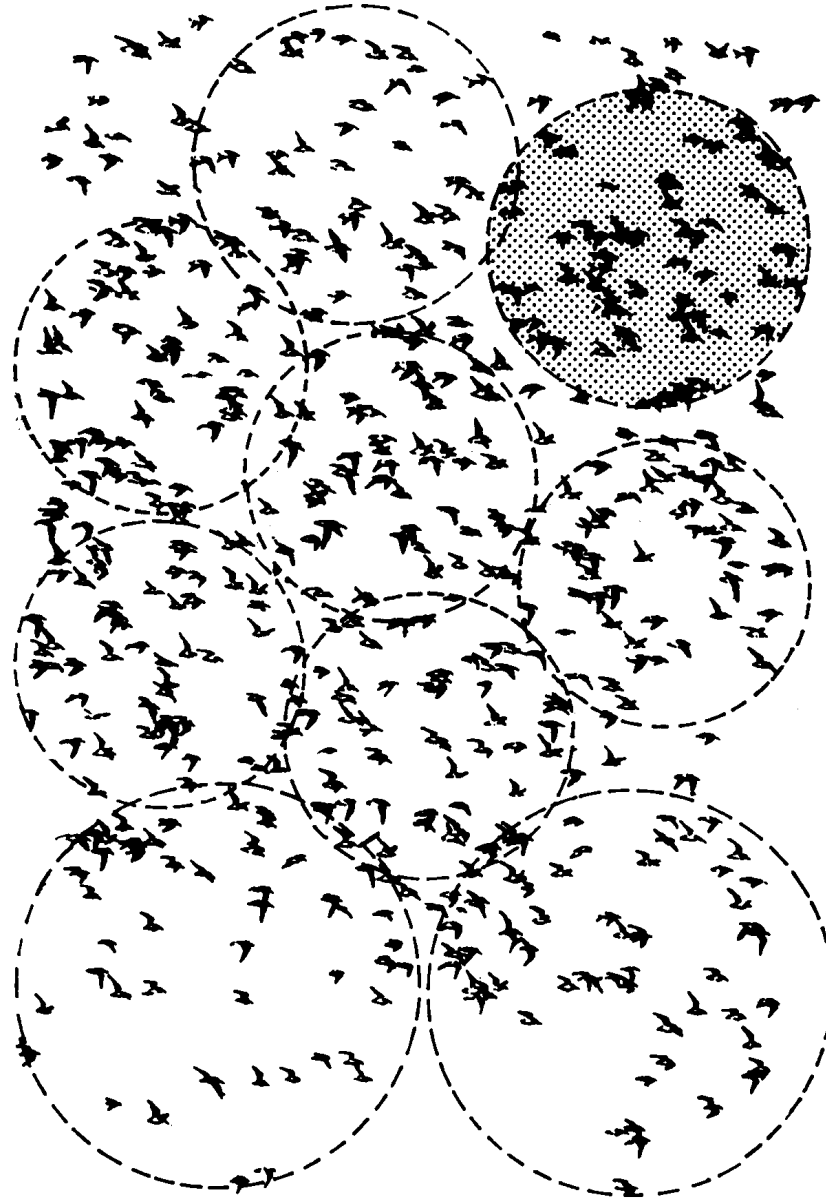


# COUNTING METHOD





# COUNTING METHOD



# Record and report birds with Flags

## Shorebird Colour Flagging Protocol in the EAAF

<https://www.eaaflyway.net/coordination-of-colour-marking/>



# Important notes for waterbird monitoring

- Ensure the same site boundary during each survey
- If possible same route, same method and same tide condition or same timing if not tide related
- Possible to have the same team leader to ensure consistency
- If survey carried by boat, avoid duplicate count
- Good to taking photo for further identification of difficult species
- If species can not be identified due to distance, visibility, keep it as unidentified.
- Not necessary to use the latest classification as this can be difficult to apply in the field.
- Always remember its important to collect wetland habitat information during every survey as habitat can change over time.
- The last rule is always “safety first”.

# Acknowledgements

- Many thanks to David Bakewell for allowing NParks to use their slides in the compilation of this PowerPoint
- Many thanks to David Bakewell, Mendis Tan and Jack Choo for contributing their photographs and Halilah Binte Ahmad for her illustrations



# References

- Howes, J., Bakewell, D. (1989). Shorebird Studies Manual. AWB Publication No. 55. Kuala Lumpur.

