

# MANAGEMENT AND REHABILITATION OF RIPARIAN RESERVES

Condensation and Modification of the  
RSPO Manual on Best Management Practices (BMPs) for the Management and  
Rehabilitation of Riparian Reserves

by

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Presented by  
Malaysian Environmental Consultants (MEC)



## WHAT CONSTITUTES A RIPARIAN RESERVE?



- A riparian reserve is a physical area that borders a stream and river

- It begins from the water's edge to a distance of 1, 2 or even 3 m above the water level



Some examples of intact riparian areas

Photo: MEC



## MAJOR REQUIREMENTS

- Riparian reserves are a major requirement in RSPO P&C.

*“Protection of water courses and wetlands, including maintaining and restoring appropriate riparian and other buffer zones (refer to national best practice and national guidelines) shall be demonstrated.”*

*- RSPO P&C 2013, indicator 4.4.2 (M)*

- Riparian reserves are categorised as High Conservation Value (HCV) 4 areas.
- Land Use Change Analysis (LUCA) HCV 4 - Loss Social Liability

## ELEMENTS FOR CONSIDERATION

- Legal requirements - Rivers are excluded from plantation area and width of the riparian zone based on river width
- Legal enforcement
- Condition of the riparian zone - planted and non – planted
- River / stream bed siltation level and debris (flooding issue)
- Bunding of riparian areas to prevent flooding
- Condition of river / stream before flowing through plantation areas
- Local community occupation and utilization vs plantation's utilization
- HCV 5 areas within buffer strips – management
- Connectivity with neighbouring estates – conservation corridors

## WHY ARE RIPARIAN AREAS IMPORTANT?



Photo: MEC

- Stabilize the river banks
- Protect the water from excessive changes in temperature
- Reduce rapid flows of water into river
- Reduce soil erosion potential
- Provide organic matter to maintain aquatic ecosystem in river
- Provide food plants and yield produce of human economic importance
- Act as a corridor, food source, and habitat for wildlife

## WHAT FEATURES ARE IMPORTANT TO CONSIDER FOR REHABILITATION?

### Physical Features

- slope of the land
- soil conditions
- width of the river
- stability and erosivity of the bank
- width of the reserve
- degree of meandering of the river

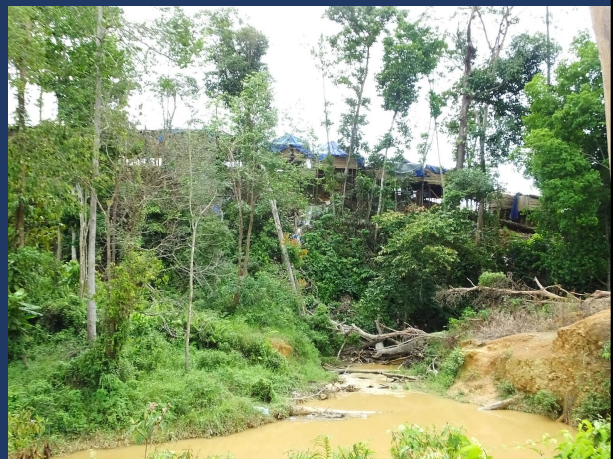


Photo: MEC



## WHAT FEATURES ARE IMPORTANT TO CONSIDER?

### Biological and Ecological Features

- types of vegetation cover (in rivers and along river banks)
- degree of exposed soil

### Features of the river and stream channels

- planting on eroding sections may be futile



Photo: MEC

## HOW TO ESTABLISH A RIPARIAN RESERVE?

1. Desktop Study - To analyze the meander belts, changes in flow directions, and identify potential riparian reserve
  - high resolution satellite images
  - aerial surveillance
  - Geographical Information System (GIS)
2. Field survey – To verify the widths of the rivers at the different locations
3. Finalized maps – To prepare riparian reserve plan.

## WHAT ARE THE MINIMUM WIDTH REQUIREMENTS FOR EACH ORDER OF STREAMS/ STREAM SIZES?

No	Width of River (m)	Width of riparian Reserve (m)
1	1 - 5	5
2	5 - 10	10
3	10 - 20	20
4	20 - 40	40
5	40 - 50	50
6	> 50	100
7	Permanent water bodies	100

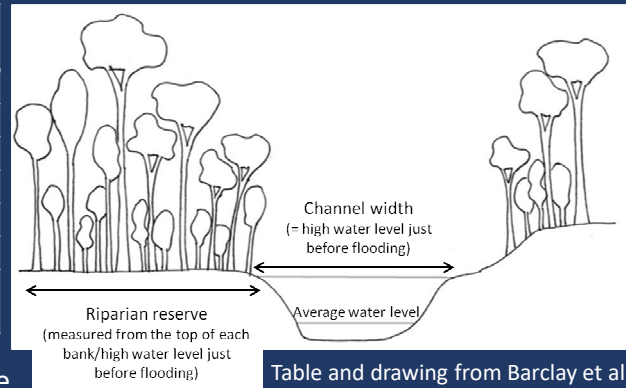


Table and drawing from Barclay et al.

The minimum width refers to the width on one bank of the river, not the total width.



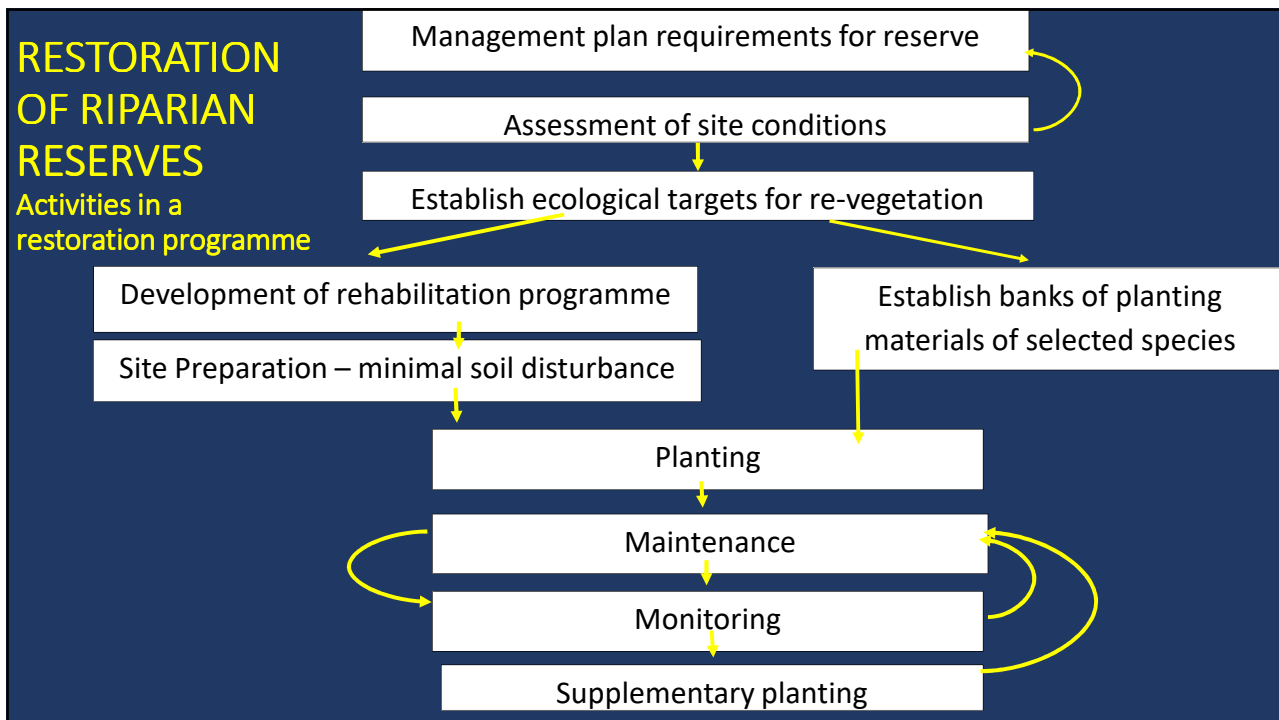
Photos: HUTAN\H. Barclay

Example of non – compliant buffer.



## RESTORATION OF RIPARIAN RESERVES

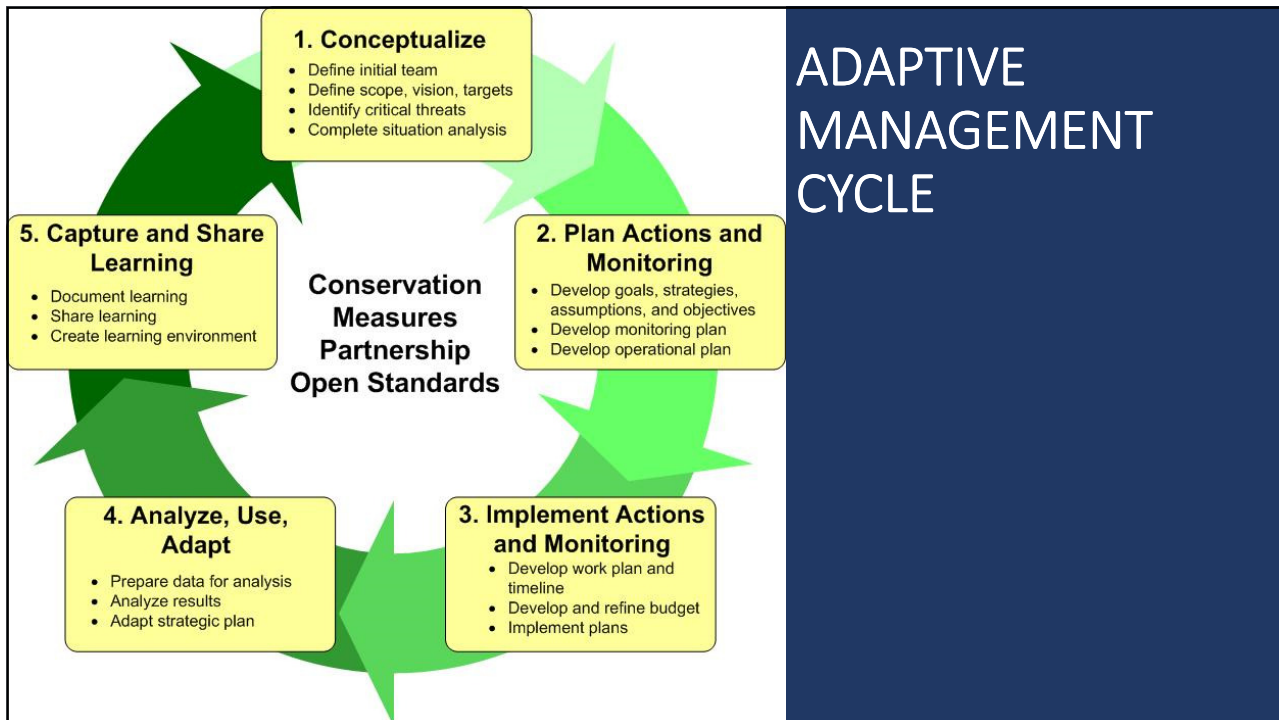
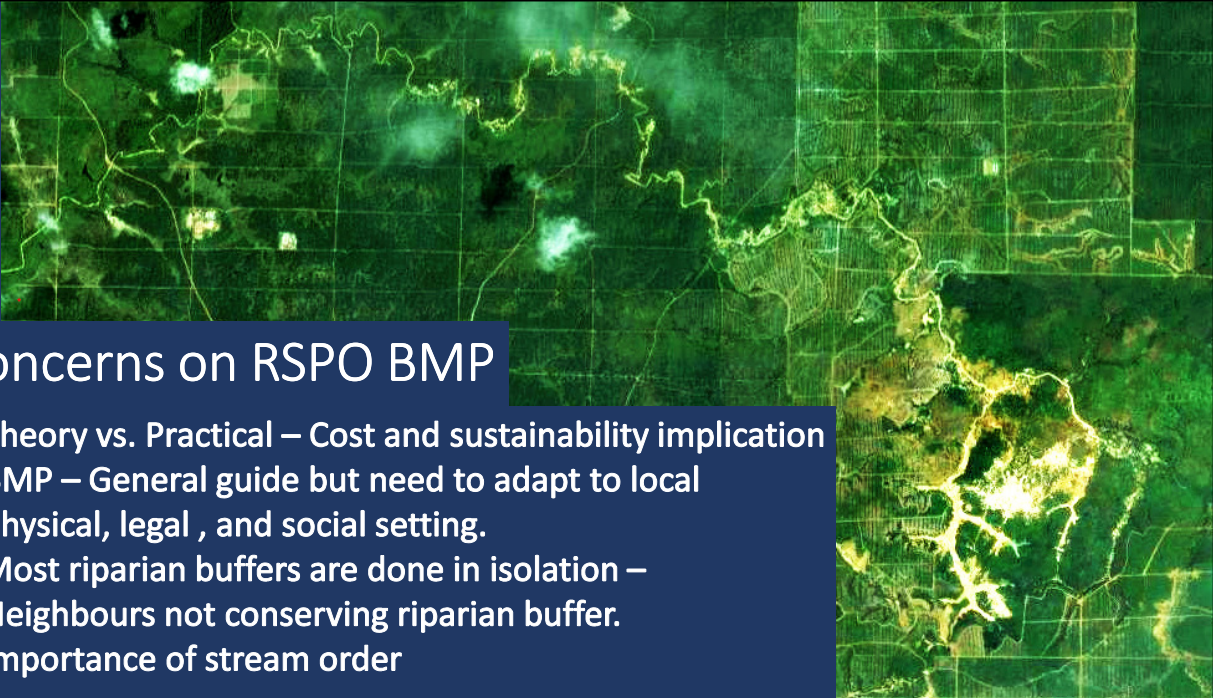
Activities in a restoration programme



## MONITORING OF RIPARIAN RESERVES

The parameters to be assessed during monitoring of the riparian reserves are:

- The survival of trees and other plants planted and mortality of other trees;
- The growth of planted trees (height and stem diameter increment);
- Changes in canopy closure/ opening;
- Changes in litter layer and amount of exposed soil surfaces;
- Changes in composition of wildlife species and numbers;
- Changes in water quality of rivers and streams;
- Condition of boundary markers and improvements that may be required; and
- Encroachment.

## Concerns on RSPO BMP

1. Theory vs. Practical – Cost and sustainability implication
2. BMP – General guide but need to adapt to local physical, legal, and social setting.
3. Most riparian buffers are done in isolation – Neighbours not conserving riparian buffer.
4. Importance of stream order

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