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

Presented by
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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?

- 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
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

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?

<table>
<thead>
<tr>
<th>No</th>
<th>Width of River (m)</th>
<th>Width of riparian Reserve (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 - 5</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>5 - 10</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>10 - 20</td>
<td>20</td>
</tr>
<tr>
<td>4</td>
<td>20 - 40</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>40 – 50</td>
<td>50</td>
</tr>
<tr>
<td>6</td>
<td>&gt; 50</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>Permanent water bodies</td>
<td>100</td>
</tr>
</tbody>
</table>

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

Example of non-compliant buffer.

Photos: HUTAN\H. Barclay
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.
ADAPTIVE MANAGEMENT CYCLE

1. Conceptualize
   - Define initial team
   - Define scope, vision, targets
   - Identify critical threats
   - Complete situation analysis

2. Plan Actions and Monitoring
   - Develop goals, strategies, assumptions, and objectives
   - Develop monitoring plan
   - Develop operational plan

3. Implement Actions and Monitoring
   - Develop work plan and timeline
   - Develop and refine budget
   - Implement plans

4. Analyze, Use, Adapt
   - Prepare data for analysis
   - Analyze results
   - Adapt strategic plan

5. Capture and Share Learning
   - Document learning
   - Share learning
   - Create learning environment

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