# Sustainable forests – post-excursion tasks
# Forest manager for a day

## Task 1: Analysis of forest inventory

During your field trip you carried out a forest inventory to gather data on trees at Wellington Discovery Forest. Using the data you collected, you need to work out the value of timber in the forest and decide what silvicultural treatment you might apply to manage timber production from this area.

1. Suggest a reason for using a radius of 5.6m for your plot (Hint: Calculate the area of your plot. 1ha = 10,000m$^2$).

2. Based on the fuel load calculated for your plot:

   a) Would you consider a hazard reduction burn to be required?

   b) Besides hazard reduction, what may be some other advantages of doing a prescribed burn on this area?

3. In order to maintain a healthy forest composition, stands to be regenerated should contain 20 per cent jarrah trees. Does the number of trees or lignotubers fulfil this requirement?

4. Calculate the basal area of each tree in m$^2$ using the formula below and fill this into your table.

$$BA_{tree} = \Pi \left( \frac{dbh}{200} \right)^2$$

5. Add these values up to get a basal area for your plot, then calculate basal area per hectare from this information by multiplying your total by 100.

   a) How does this value compare with the value you obtained using the basal area prism?

   b) Which do you think gives a more accurate result?

   c) What would be the main advantage of using a basal area prism?

6. Try to calculate how much this stand is worth if it was to be harvested for timber:

   a) Calculate the volume of wood in your plot and multiply by 100 to get the volume per hectare. You should use only those trees which are crop trees or potential crop trees. The volume of each tree can be calculated by multiplying the basal area of the tree by its bole height (height to crown break). Since you only had time to measure the heights of two trees in your plot, use the average of these two heights for the other trees.

$$V_{saw\,log} = BA_{tree} \times h$$

   b) When sawlogs are cut into timber, approximately 40 per cent ends up as saleable timber. Based on a price of $2,000/m$^3$, what is the market value per hectare of harvestable trees in this forest? What kind of value-added products could be produced from the waste?

   c) If the stand was allowed to mature, calculate the value of sawn timber when all potential crop trees have reached 50cm dbh.

Consider your observations and discuss the following questions to determine a suitable silvicultural treatment for this stand:

   d) Are there any trees in your plot that could be harvested for timber now?

   e) Based on a final density of 125spha, do you think there are sufficient potential crop trees to fulfill this requirement if we thinned the stand and allowed it to grow?

   f) Based on a requirement of a regeneration pool of 1,000spha, do your measurements indicate that this stand has sufficient lignotubers to create a gap and release regeneration?

   g) If there are insufficient lignotubers, can you suggest a reason why this may be? (Hint: Consider the recent (past 150 years) history of this area of forest.)

7. What treatment or treatments do you think would be appropriate to this stand of forest, and why?

## Task 2: Create a sustainable forestry management plan

Sustainable forestry should be guided by a management plan. Using the information you gathered on your excursion, the data processed above and any other resources you are required to produce a sustainable forestry management plan for Wellington Discovery Forest as a multiple-use area using the guide questions provided.

The management plan should address the first six of the seven criteria of the Montreal Process Criteria and Indicators of Sustainable Forest Management. The seven criteria are:

1. Conservation of biological diversity
2. Maintenance of productive capacity of forest ecosystems
3. Maintenance of ecosystem health and vitality
4. Conservation and maintenance of soil and water resources
5. Maintenance of forest contribution to global carbon cycles
6. Maintenance and enhancement of long-term multiple socio-economic benefits to meet the needs of societies
7. Legal, institutional and economic framework for forest conservation and sustainable management

**Important issues you need to consider are:**

- what the uses of this forest will be (What are the range of uses the community desires?)
- biodiversity conservation (provision of habitat and nesting sites, monitoring of populations)
- erosion and preservation of wetlands and riparian zones
- management of Phythophthera cinnamomi
- rare and threatened flora and fauna
- treatment of stands to manage production of a sustainable timber harvest
- appropriate fire regimes.

### Tasks:

1. Describe the location and features of Wellington Discovery Forest and its history.
2. Create a list of uses to which this section of forest will be put. This will include a sustainable timber harvest but you need to consider everything you saw and heard during your excursion that provides clues to other uses.
3. On the map of Wellington Discovery Forest, draw the boundaries of the management area. Within this area, draw boundaries to show the different stand types from the information you received during the excursion and give each of these a number.
4. List the values for which Wellington Discovery Forest is to be managed using the following headings:
   - social
   - environmental
   - economic.
5. Within your group, discuss the management objectives you need to address at Wellington Discovery Forest based on the values you have identified.
6. Discuss within your group areas which need to be reserved as buffer zones for protection of water, biodiversity or aesthetic values. Mark each of these buffer zones on your map.
7. Does this area contain any rare or threatened flora or fauna? Within your group, discuss strategies for the protection and monitoring of these and include this in your plan.
8. Based on fuel ages in each stand and infrastructure, suggest a prescribed burn plan for the next 10 years. For each burn you propose, specify the reasons for it, for example biodiversity enhancement, protection of assets, removal of tops and stimulation of lignotuber development.
9. If there are known areas of Phytophthora cinnamomi disease present, mark these on your map and devise strategies to limit its spread.
10. For each stand, write a description of the stand (type, density, age and size of trees). You need to consider whether each stand will be available for harvesting and, if so, whether there is already a saleable product in the stand or not. You will also need to suggest a silvicultural treatment for each stand.
11. Produce a management plan incorporating all of the information above.

### Optional:

12. Use the internet to research the legislation and policies (state and national) which must be adhered to in the development of any management plan for native state forests.

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