



Forests and their impact on water quality and quantity



*Photo:
M. Ryan*

Teacher Overview

This lesson is a brief introduction to some of the impacts that forestry can have on waterways. Students will:

- complete an annotated diagram (using online research) to highlight some of the negative and positive effects of this industry;
- complete a table relating to the changes to groundwater and stream flows that can be attributed to various features of a plantation forest;
- draw on their class work of other agricultural practices and their impacts on water quality and quantity and combine these with their study of plantations to complete an extended response question.

Stage

Year 12 Agriculture



Syllabus Links

Outcomes

H1.1 explains the influence of the physical, biological, social, historical and economic factors on sustainable agricultural production

H2.1 describes the inputs, processes and interactions of plant production systems

Students learn about:

- Factors contributing to the degradation of soil and water
- Practices that have contributed to changes in water quality and availability

Students learn to:

- Describe farming/agricultural practices that have affected water quality and quantity including fertiliser usage, the effects of stock, effluent management, chemicals, grassed waterways, riparian zones, dam construction and irrigation methods.

Lesson Overview

Introductory factsheet (Approx. 10 minutes)

Students will be introduced to some preliminary information regarding water quality and quantity that will enable them to complete Activity 1. Students will gain an understanding that the effects of plantations have both positive and negative impacts on water quality and quantity.

Activity 1 (Approx. 30-40 minutes)

Using the supplied factsheet and three provided website URL's, (teachers may like to provide additional sources to this activity and conduct it as a group task), students will annotate a simple diagram of a forest, road and a waterway, highlighting the positive and negatives impacts on water quality and quantity in this type of environment. When viewing and researching the website links provided,



students should spend approximately ten minutes or less generating notes on the impacts on water.

Activity 2 (Approx. 5 minutes)

Using a link to the Western Australian Government Water website, students will complete a table on small and large changes to stream flow and groundwater and their relationship to forestry.

Activity 3 (Approx. 20- 30 minutes)

Using class work that teachers have already covered (including other agricultural practices (*including fertiliser usage, the effects of stock, effluent management, chemicals, grassed waterways, riparian zones, dam construction and irrigation methods*) and their effects on water quality and quantity), students should use this knowledge and the information on forestry provided to plan and answer the question.

References

1. Plantation forestry and water management guide. Government of Western Australia, Department of Water. June 2009. Accessed on 5th June, 2017.
https://www.water.wa.gov.au/_data/assets/pdf_file/0004/5539/89745.pdf
2. How do we apply scientific findings, water quality. Forest Education Foundation. Accessed on 5th June 2017.
http://www.forest-education.com/sites/forest-education/files/2.5_how_do_we_apply_scientific_findings-water_quality.pdf
3. primefacts: Water management in native forests and plantations March 2010. Accessed on 7th June, 2017.
http://www.forestrycorporation.com.au/_data/assets/pdf_file/0007/438244/Water-management-in-native-forests-and-plantations.pdf



Resources

- a) Student workbook.
- b) Online sources (URL links are also provided on the student worksheet).
- c) Sample answers for Student Workbook.

Activity 1

- Plantation forestry and water management guide.
https://www.water.wa.gov.au/_data/assets/pdf_file/0004/5539/89745.pdf
- Forest Education Foundation.
[http://www.forest-education.com/sites/forest-education/files/2.5 how do we apply scientific findings-water quality.pdf](http://www.forest-education.com/sites/forest-education/files/2.5%20how%20do%20we%20apply%20scientific%20findings-water%20quality.pdf)
- primefacts: Water management in native forests and plantations.
http://www.forestrycorporation.com.au/_data/assets/pdf_file/0007/438244/Water-management-in-native-forests-and-plantations.pdf

Activity 2

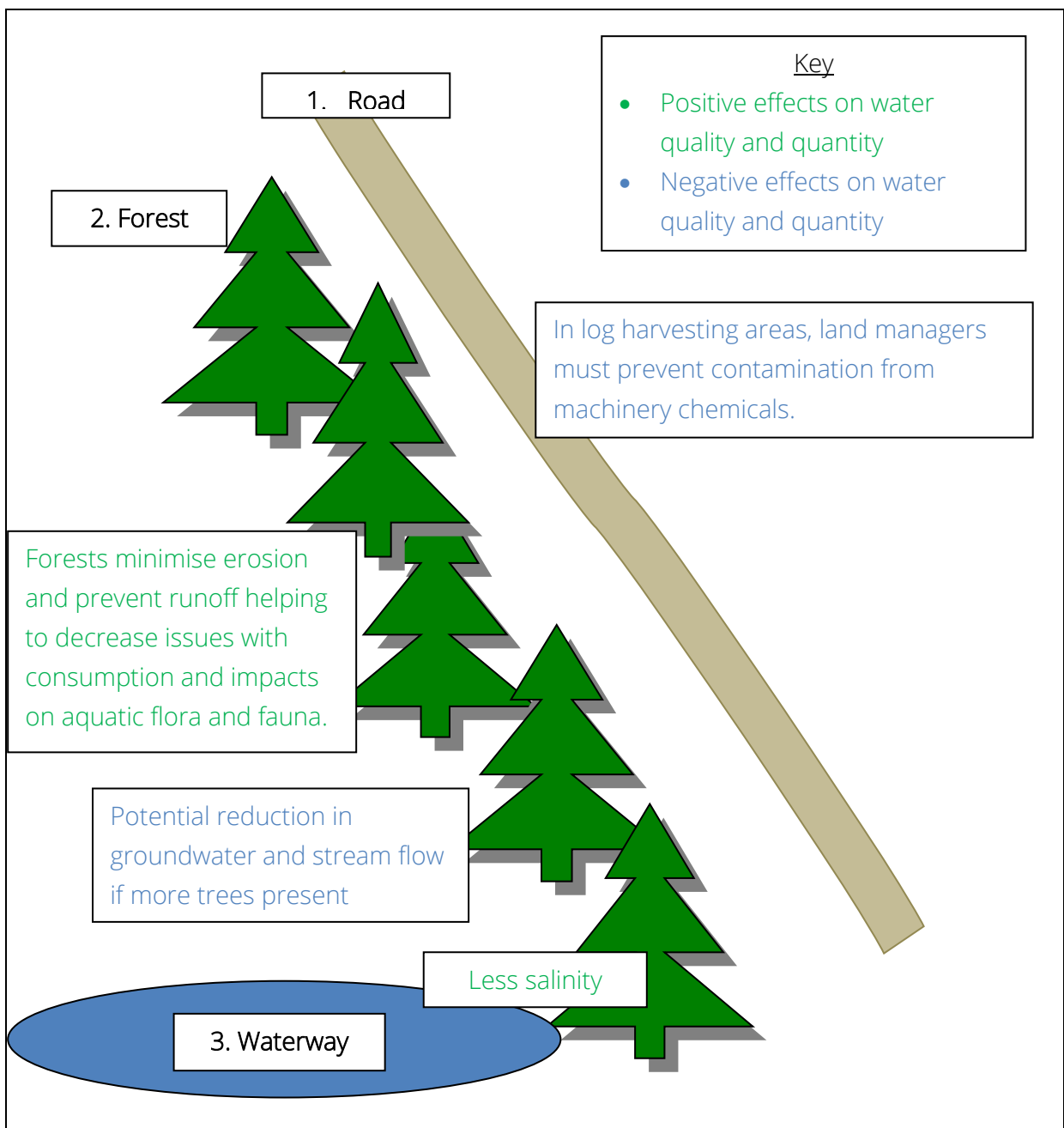
- Plantation forestry and water management guide.
https://www.water.wa.gov.au/_data/assets/pdf_file/0004/5539/89745.pdf



Sample Answers

Activity 1

*Answers will vary depending on student's personal research. Below is an example of how students will begin to annotate the diagram.



Activity 2

Note: Student answers will vary depending on student research.

LARGE reduction in stream flow and or groundwater	SMALL reduction in stream flow and or groundwater
Large area of plantation forestry	Small area of plantation forestry
Mature trees with large canopies	Immature trees with small canopies
Shallow groundwater	Deep groundwater
Plantations close to streams	Plantations in upper streams
High tree density	Low tree density

Creative Commons License



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/).

ForestLearning is an initiative of Forest and Wood Products Limited and these resources have been developed by qualified educators and designed to assist teachers deliver the Australian Curriculum.