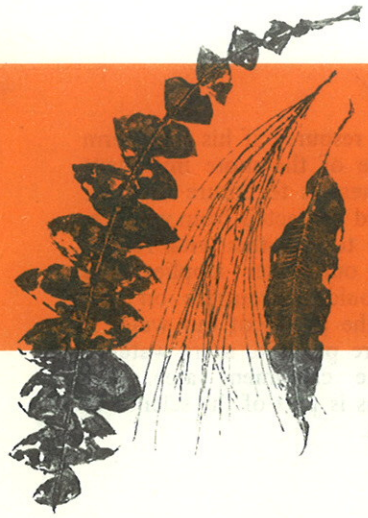

INFORMATION SHEET 10

FORESTS . . .

their importance to water supplies

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Water is one of the most important products man obtains from his forests. History records many examples of nations which, because of their wasteful use of forests, sealed their own doom by destroying their water supplies. These examples are a warning to modern man, whose demands for water are increasing all the time. By careful forest management he can help to ensure that his future needs for water are met.

Forests are most important as a vegetative cover to protect the water catchments of the world. This is particularly so in Australia, the driest of the continents. It is interesting to note that the total flow of all Australian rivers barely equals that of the Mississippi, which is only one of the world's many great rivers. The future development of Australia as a nation is more likely to be limited by water than by any other resource.

Forests affect water supplies in three main ways. They control the quantity of water which flows into the streams, the rate at which it is released and they also play an important part in determining the quality of the water supply.

The Quantity of Water

Trees must have water to sustain life and growth. Because of this, not all of the rainfall is available to maintain stream flow. Losses occur by evaporation and also by the large amount of water which is absorbed from the soil by the tree roots. Some of this absorbed water is used in growth but most of it passes out through the leaves in a natural process called transpiration.

There is no evidence that the species of tree significantly affects the quantity of water released to the streams by mature forests.

In Australia, for example, streams fed by catchments which have been planted to pine trees seem to flow at much the same rates as they did when native eucalypt forest protected the catchments. The stage of development seems to be more important than age or species, and there is evidence that very young forests use less water than older forests, presumably because the smaller root systems have not fully explored the soil volume in their search for nourishment.

The Rate of Water Released to Streams

Ground vegetation and the litter layer effectively reduce the speed at which water can flow into the streams. The ground vegetation slows the force with which raindrops hit the ground, thus avoiding splash erosion and reducing the risk of compaction. The litter layer impedes surface flow thereby reducing erosion and allowing more water to percolate deep into the soil.

There are other ways in which rainwater enters the forest soil. It may follow the courses of rotted tree roots, it enters animal burrows and ant nests, and fills low lying areas to be gradually absorbed later on. Not all of this stored water is needed by the forest and the surplus flows into the streams and rivers by means of underground drainage and springs. This controlling influence on the rate of release results in a more even stream flow and contributes greatly to the maintenance of river flows during periods of dry weather, when the water is most needed by man, animals and crops.

Water Quality

Water is of use to man only if it is capable of serving his needs. To do so, it must be free from harmful bacteria, it should be free of suspended particles such as silt and clay and it should be relatively free of chemicals such as calcium and magnesium carbonates (which make it "hard") or salt (which makes it unpalatable). Most wildlife can live on realtively impure water but fish are extremely sensitive and die if the water is unsuited to their needs.

Western Australia

The present (1971-72) consumption of water in the Perth Metropolitan Area is 155,000,000,000 litres per year. This represents an average use of about 600 litres per person per day. The requirements for water have doubled in the past ten years and are expected to increase rapidly in the future.

Some 90 per cent of the water used in the Perth Metropolitan Area comes from State forests. In addition, catchments located largely on State forests provide water for the agricultural and goldfields areas (Wellington Dam, Mundaring Weir), as well as irrigation water for the dairying industry (Waroona, Samson, Logue's Brook, Stirling Dam, Glen Mervyn and Harvey Weir).

New dams such as the South Dandalup are being constructed to keep up with the increasing demand for water. Further damsites on the North Dandalup and Murray Rivers are proposed for the future. The time may not be too distant when rivers in the southern forests, e.g. the Donnelly, are dammed for water supply purposes.

Water from areas of State forest is preferred since

- The yields are relatively high,
- The bacterial and silt content is low,
- The salt content is low,
- Suitable sites for the construction of dams are available.

The State forests of Western Australia are not only important as a timber, flora, fauna and recreational asset, but are also vital to the maintenance of adequate water supplies.

The Future

We have already seen that man has a real need to jealously guard his water resource if his long term needs are to be met. One of the more important aspects of forest management is to ensure that our forests are kept healthy and protected from wildfire, so that they will continue to play their vital role in protecting and regulating our water supplies. The management activities should concentrate on two major objectives – that the purity of our water is maintained and that, where possible, more water is made available from the catchment area. The achievements of these aims is part of the science of modern forest management.