

Forest Management

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Managing Forests

Managing established forests is a complicated matter. You must control how much wood is cut from the forest at the same time that you take care of the people's needs for wood.

Managing Forests

Managing forests involves much more than just cutting wood, however. Forest management uses many types of conservation practices including taking care of mature forests as well as site preparation, tree planting, irrigation, soil erosion practices, forest protection, grazing practices, harvest road construction, and protected areas.

Managing Existing Forests

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The first thing that you should do to manage an existing forest is to complete a forest inventory. As we have already discussed, the inventory is needed to know important information about the forest. You cannot properly manage the forest without it.

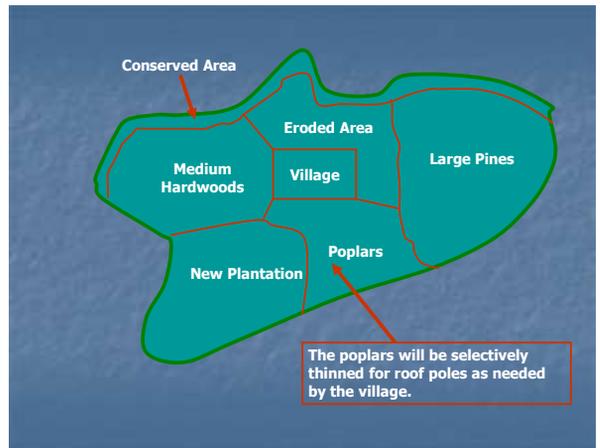
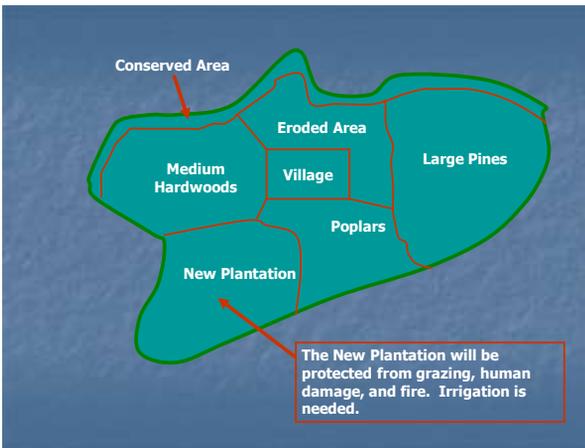
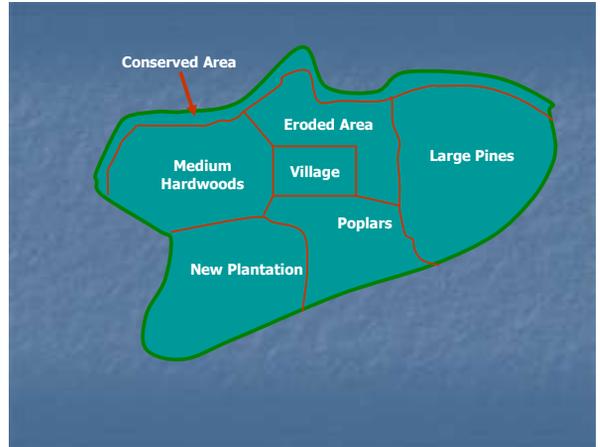
Managing Existing Forests

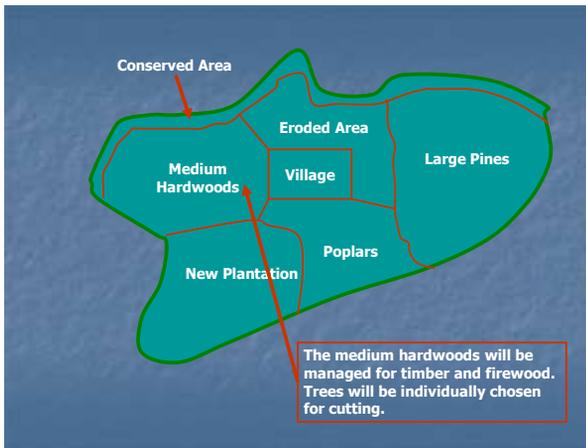
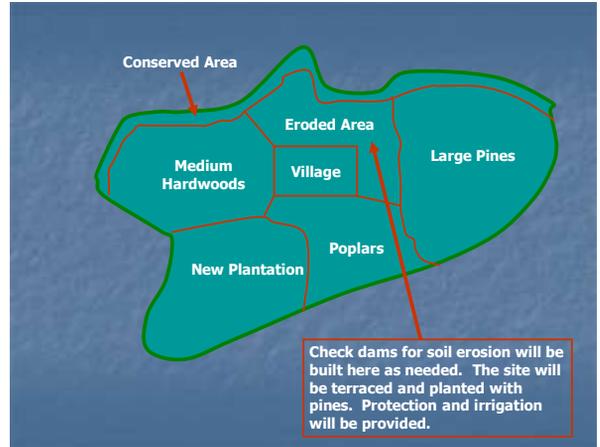
Once you know about the forest from the inventory, you should divide the forest into compartments, or parcels. The compartments are divided so that areas that have the same forest characteristics are managed in the same way.

Managing Existing Forests

The compartments might be divided by type of trees, size of trees, erosion areas, grazing areas, plantations, and other considerations. The key idea is to put the areas that can be managed the same way into the same compartments.







Forest Harvests

Forest Harvests

Cutting the trees in the forest is necessary from time to time to maintain the health and vigor of the forest and to provide needed timber products from the forest. You should conduct the harvests in a sustainable manner so that the forest is not degraded by what you do.

Why Do We Harvest?

Cutting in merchantable forest stands is done periodically to concentrate growth on crop trees, reduce susceptibility to diseases and insects, remove suppressed and dying trees, improve growth of grasses and other plants beneficial for livestock and/or wildlife forage, adjust species composition, and increase economic gain for the land users.

Forest Harvests

Rules to follow for harvesting trees:

- Don't remove more tree volume than what will grow back before the next harvest. In stands that are not fully stocked, only a portion of the growth is cut.
- Always leave your very best trees in the forest for the future.

Forest Harvests

Trees to be cut from the forest should be selectively chosen. The worst trees in the forest should be cut first:

1. Diseased or unhealthy trees
2. Damaged trees
3. Forked trees
4. Trees with suppressed growth from being in the shade of other trees
5. Old trees that might die before the next harvest.

Forest Harvests

Harvest tree selection will be done either by targeting single individual trees or by removing a group of trees to create openings in the forest canopy. The openings provide freedom from competition for the natural establishment of tree species that are intolerant of shade, such as pines and oaks. In this manner a diversity of age and size classes of trees is maintained.

Overstocked Stand



Selective Thinning



Group Selection Thinning



Forest Harvests

It is important to time harvest treatments and proceed with practice installation carefully to avoid damage to the site. It may be years before a forest recovers from improper harvesting practices. Locating a harvest road in the wrong spot can lead to severe soil erosion. Running heavy trucks over wet roads can damage the soil.

Harvest Roads

Harvest roads should generally follow natural contours and slopes to minimize disturbance of drainage patterns. They should be located where they can be maintained and where water management problems are not created.

Harvest Road Design

1. The minimum width of a logging road should be 4.5 meters. The road should be a little wider around curves and turnouts.
2. Turnouts are needed on single lane roads where traffic will be going in both directions. The width will be increased to a minimum of 6.25 meters for a distance of at least 9 meters. This will allow vehicles to pass safely.

Harvest Road Design

3. Provide turn arounds at the end of dead end roads.
4. Water management on the road is extremely important to prevent soil erosion. Provide culverts or water bars to move water from one side of the road to the other. Spacing of the water management structures depends upon the grade of the road and the type of soil.

Recommended Spacing for Relief Culverts and Water Bars



Harvest Road Design

5. Turnout ditches can be used to move the water away from the road and to disperse it into vegetated areas or piles of rocks.
6. Surface crowning can also be used to direct road runoff into side drainage ditches.
7. Roadside ditches should be 0.3 m below the road surface to provide internal drainage.
8. Drainages should be crossed at 90 degree angles.

Road Gradient (% Slope)	Spacing of turnout ditches
2-5	61 meters
5-10	30.5 meters
>10	23 meters

Plantations

Plantations

Because so many of the forests of Afghanistan have been degraded or destroyed, you will have to plan tree planting projects to try to get the forests back. These plantations will require a lot of work in the form of site preparation, planting, irrigation, and protection.

Site Preparation

- Terraces – Build the planting terraces on the contour of the land. Improperly designed terraces will cause soil erosion problems. On steeper slopes, make the terraces 3 meters apart. On gentler slopes, make the terraces 4 meters apart. Don't dig the terraces too deep, and make the sides slope instead of being straight up and down.

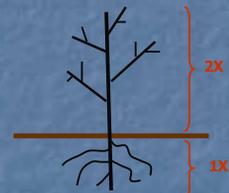
Site Preparation

- Pits – Dig a planting hole 3 times the width of the tree's root ball in the middle 1/3 of the leading mound on the terraces. The depth of the pit should be the same depth as the root ball or a little less. Do not dig deeper than the depth required to have the first roots just below ground level.



Planting

- Saplings – Use healthy trees with no more than 2 times as much top as roots. The root system should be well developed with many root branches. The roots should not be wrapped around and around inside the nursery bag. The tree stems should have no wounding, disease, or decay.



Planting

- Seeds – Use seeds from local trees if possible. Choose the best trees from which to gather the seeds. Consider good growth, good form, resistance to disease, and other factors when choosing. Cover the seed so that their depth is 2-4 times their size. Firmly press the soil over the seed.

Irrigation

The young trees should be watered for several years if possible. The length of time required depends upon the species planted. Irrigation should begin in May and last through October with one irrigation per month except for June and July which require two irrigations.

Forest Protection

Why Protect the Forest?

- Overgrazing by sheep and goats – The animals will eat any young trees that are planted or that come up naturally in the forest. Grazing should be prevented in new plantations and controlled in older stands.



Why Protect the Forest?

- Human damage – People might break the trees when gathering pistachios or cut them for firewood in an unsustainable way. Sometimes children will damage them.



Why Protect the Forest?

- Fire – Accidental fires in the forest can damage or kill the trees. Firefighting hand tools such as shovels, rakes, and cloth bags to wet should be kept on hand in case of fire in the forest.



Why Protect the Forest?

- Insects and Disease – These can damage a forest quickly if no monitoring is done. The forester should watch for these things and teach the guard what to look for.



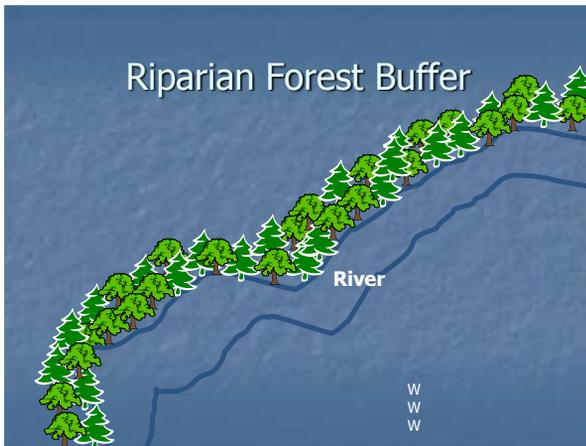
How Can We Protect the Forest?

- Forester – knowledgeable about management techniques, insects & diseases, and other forest information
- Guard – keeps livestock and people from hurting the trees, watches for fire
- Fence – Keeps out both animals and people
- Education – local people need to be educated on why we manage the forests so they can assist in the care

Riparian Forest Buffers

What are riparian buffers?

Riparian buffers are areas along a river, stream, lake, or wetland that are planted to trees. Their purpose is to provide shade for the water and the people, to clean muddy water from soil erosion before it reaches the river, to slow down flood waters, and to provide habitat for wildlife and birds.



Riparian Forest Buffer



How Do the Buffers Work?

- The trees slow down the water as it flows through the buffer so that the eroded soil particles have time to settle out of the water.
- The roots allow the water to soak into the ground better instead of just flowing over the ground.

How Do the Buffers Work?

- The trees also help slow down flooding that occurs along the rivers. The tree trunks break the speed of the flood water as it comes out of the river, and the slower water does not do as much damage to the land. The tree roots help to hold the soil in place and prevent scour erosion from fast moving water.

How Do the Buffers Work?

- The fallen leaves from the trees protect the soil from erosion and act as a filter to clean the soil erosion from the water.
- The leaves and branches that fall into the water are the base of the aquatic food chain. This food source enhances the habitat for fish and other aquatic animals.

How Do the Buffers Work?

- The shade from the trees cools the water temperature and also enhances the habitat for fish.
- The buffer of trees is good for land-based wildlife species because it creates new cover and food for them.

How are the Buffers Designed?

- The buffer should be at least 11 meters wide. Measure the distance from the top of the bank of the water body.
- The trees should be planted 3 or 4 meters apart.
- If there will only be 2 rows of trees in the buffer, be sure to stagger the planting for maximum tree coverage.

How are the Buffers Designed?

- The length of the buffer must be at least two times the width to function properly.
- Either pines or hardwoods may be planted in the buffer, but hardwoods work better because of their root types and the amount of leaves falling to the ground. Choose the kinds of trees that match the soil and the soil moisture.