5. HUNTING

Hunting in Slovakia is realized in 1818 state and private huntinggrounds with exactly given borders. The average land area of the huntinggrounds is 2428 hectares. The organization of hunting is provided by the Ministry of Agriculture, Regional and Local Forest Offices, which pass off the shooting licence. Hunting planning is realized in individual huntingrounds. The amount of hunt is given according to the number of game in spring. The game keeping is also planned for the huntingground. It depends on the normed stock of game which is counted for every huntingground according to the carrying capacity of the huntingground.

Word formation

Write the correct words and use them in sentences. You can choose three pairs of them

verb	noun
hunt	
	realization
organize	
	shooting
keep	
	border

noun	adjective
privacy	
	agricultural
region	
	local
state	
	average

Read the text silently again and answer the questions:

1. When did the hunting in Slovakia start?

- 2. How large is the area of the huntinggrounds?
- 3. Who provides this activity?

4. Which document do they pass?5. How is on the normed stock of game counted?

Explain these words in English:

1.Huntingground	
2.Shooting licence	
3 Game	
o ounie	

5.1 Division of the game

Read the text and translate it with the help of the dictionary:

Slovakia is characteristic for its large variety of natural communities that is why we can find here the **plain fieldgrounds**, **pheasantries**, **game-preserves** but typical are the **forest huntinggrounds**. This variety influences the number of game species. From the **hoofed game** the most hunted is the wild boar and roe deer. With the number of 12 000 hunted pieces on the prominent position there is the red deer. From the non-original species we keep in the game-preserves mainly fallow-deers and mouflons. From the **furred game** we can meet in Slovakia the rabbits and hares. The **beasts of prey** are very attractive in the huntinggrounds. The bear, wolf, lynx but also the wild cat or otter together with foxes and badgers are the common representatives of our fauna. From the **feathered game** the most frequent is the pheasant and wild duck. The partridge was very numerous in the past but its number decreased to 15 000 pieces mainly due to the intensive agriculture. From the **rare forest gallinacean birds** we can meet in the Slovak huntinggrounds the wood grouse, black grouse and hazel grouse. Very favourite among the hunters is the wood-cock. Except for these species there are many species of **birds of prey** and grey-crow birds which are important for the hunting.

Read the text and finish the sentence:

1.In Slovakia there are many natural communities like
- -
2.On the first position of hunted animals is the
3. Very attractive for hunting are the
4. The number of hunteddecreases due to the intensive agriculture.
5.Grey-crow birds are

Read the text and write the examples of each group of animals:

Hoofed game	
Furred game	
Beasts of prey	
Feathered game	
Rare forest birds	

What do these numbers and expressions refere to?

1.12 000	
2.15.000	
3. frequent	
4. numerous	
5 intensive	
	•••••

Fill in the second part of the expression:

1.game	4.beasts of
2.fallow	5.black
3.hunting	6.grey

How many animals can you find in this line? Write the number

BOARMOUFLONRABBITFOXBADGERWOLFPHEASANTGROUSEDUCK

5.2 Game care

Read the text and write these words into the gaps:

meadows	potatoes	hay	sunflower	fruit	care
mauows	polatocs	may	Sumover	munt	cure

Read the text again and write which group of feeding does this feed belong to?

Which kind of feed is hidden in the crossword?

1	2	3	4	5	6

- 1. pstruh
- 2. pod
- 3. puška
- 4. mloky
- 5. ideálny
- 6. šťuky

Read the text again and try to speak about game feeding in Slovakia

Cover the text and write it as a dictation. Correct the text

5.3 The hunting kynology

The hunting kynology represents one of the significant aspects of hunting in Slovakia. The number of individual **hunting dog breeds** depends on the conditions of the huntingground and hunted game. In the lowlands the prevailing breeds are **bloodhounds**, **tracker dogs** while in the mountain areas they are mainly **hound dogs** and **bloodhounds**. The hunting legislation dictates to have one **dachshund** or **black and tan dog** for the **burrowing** in one huntingground. Each hunting dog has to pass the tests of hunting usability.

Are these sentences true (T) or false (F)?

- 1. Hunting kynology is very important for hunting in Slovakia.
- 2.Conditions of the huntingrounds depend on the hunting dog breeds.
- 3. There are more bloodhounds in the lowlands than in the mountains.
- 4. You can't have more than one dachshund for the burrowing in one huntingground.
- 5.All hunting dogs must have the tests of hunting usability.

Write these words correctly

1.dog breads	
2.bloodhunds	
3.dachshound	
4.burowing	
5. jusability	

Explain these words in English:

1.kynology	
2.breed	
3.huntingground	
4. legislation.	
5. hunting usability.	

Which breeds of dogs are there in the pictures?



5.4 Ways of hunting

Write the correct form of the word to the gap

The most used way ofthe roofed game is the stalking and	hunt
still hunt. Less fequent is theof the game or an individual	track
hunting with the dogs. If we the wild boars we can take part in	hunter
the collective hunt with dogs on the baiting places but also in the	
night when there is the full moon. We hunt thegame mostly	feather
in the common hunts and during the More various is the	migrate
way of hunting the predacious animals even when thethe	catch
animals in the irons and otherways of hunting are forbidden.	human

Answer the questions:

- 1. How can we hunt the roofed game?
- 2.How do they hunt the wild boars?
- 3.Do they hunt feathered game during the full moon?
- 4. Which animals are hunted in an individual and which ones in a collective hunt?
- 5. Which ways of hunting are not human?

Use these words in sentences:

1.Stalking	
2.Baiting places	
3. Predacious animals	
4 Common hunts	
5 Still hunt	
	· • • • • • • • • • • • • • • • • • • •



Describe the picture, way of hunting, hunted game

5.5 Importance of hunting

Read the text and translate it with the help of the dictionary

Slovakia is spoken as a paradise for hunters. Hunting is performed on a highly professional level and enjoys a very long tradition, mainly on the part of **foreign hunters**. In the hunting areas they offer hunters not only opportunity for **shooting selected game** (mouflon, red deer, roe deer, fallow deer, wild boar, pheasant, partridge), but also **an accommodation in a** well equipped **hunter's chalet** with **full board**. Experienced quides and other personel are ready to help not only in hunting, but also in preparation of **trophies** and their **export**.

Many trophies are shown at the **exhibitions**. The aim of them is to bring to attention of the public the results of **game-keeping** and **game-breeding** and to present a wide selection of the best trophies even at the World exhibitions. Most widely represented are the **antles** of stags and fallow deeer, **the tusks** of wild boar and chamois **horns**. There are also the **masks** and **skins** of bears, wolves, lynx, foxes, otters, martens and mouflon trophies.

Hunting brings not only money, and reputation, but it also develops the hunting tourism, it helps our economy and helps to select the healthy game.

Choose the correct answer

1.In the hunting areas you can shoot the game and also get				
A. exhibition	B. accommodation	C. money		
2.You can stay in a cha	let with			
A. full board	B. boar	C. personel		
3.Thehelp	you in hunting, prepara	ation of trophies and their export.		
A. hunters	B. guides	C. bears		
4.Very frequent are	of stags.			
A. antlers	B. horns	C. tusks		

5. You ca see the skins of.....at the exhibitions.

A. guides B. stags C. wolves

Work with your partner. You saw this advertisement on the Internet. Call to the travel agency and order the hunting trip. Ask about the length of hunting, payments, terms, accommodation, services included in the price

UNFORGETABLE HUNTING

8 days – hunting the bear payment – 12,000 Euro terms – 20-27 September conditions – you can shoot just one animal services: transport from the airport food+non-alcoholic drinks accomodation in a camp guide during the hunting trip care about the trophies

Read the text again and retell it

5.6 The right equipment

If you want to have a successful hunting season, you have to start with the right equipment:

- 1. *The right clothing*. Hunting clothing should fit the climate that you will be hunting, as well as your style of hunting
- 2. *Comfortable boots.* Boots are certainly a part of the right clothing. You will want a pair of boots that keep your feet warm, but you also want to make sure that the boots are comfortable if you have to walk a lot. Make sure that the boots you buy are waterproof.
- 3. **The right gun.** Having the right weapon can make all the difference when hunting. Get a gun that fits you comfortably, and that you can shoot well.

A good knife. If you are successful in your hunting, no piece of equipment will be more valuable than a good knife.

Answer the questions:

- 1. What belongs to the right equipment for hunting?
- 2. What quality must be your shoes not to let your feet get wet?
- 3.Can we go hunting in a T-shirt and jeans?
- 4. Which kind of weapon should we take with us?
- 5. What three qualities must good shoes have?

Finish the words:

1.value	4.success
2.water	5.differ
3.equip	6.comfort

Hunting weapons and their parts: write the name of the weapon or equipment in the picture



5.7 Vocabulary:

hunting provide amount carrying capacity phesantries boar mouflon hare badger partridge gallinacean birds hazel grouse grey-crow silage fleshy feed browsing area aspect prevail hound dogs burrowing still hunt irons selected game trophy otter mask shotgun gunstock

huntingground Ministry of Agriculture game plain game-preserve roe deer furred game beasts of prey feathered game decrease grouse wood-cock elaborated corn turnip hay hunting dog bloodhounds dachshund usability baiting places forbidden chalet antlers marten waterproof binoculars gun barrel

border shooting licence stock of game fieldgrounds hoofed game fallow-deer rabbit lvnx pheasant rare black grouse birds of prev the bulk feed grain meadow kynology breed tracker dog black and tan dog stalking predacious animals paradise fullboard tusks horn scattergun trigger fielglass

6. SILVICULTURE

Write as many words as possible concerning the forest and starting with the given letter:

<i>S</i> - <i>seed</i> ,	• • • • • • • • • • • • • • • • • • • •	••••••	••••••	
<i>I</i>		••••••		
<i>L</i>		•••••		•••••
<i>V</i>	• • • • • • • • • • • • • • • • • • • •	••••••		
<i>I</i>				
С				
<i>U</i>				
<i>I</i>				
 T				
R				
F.				
L		•••••••	• • • • • • • • • • • • • • • • • • • •	•••••

Read the text and translate it:

Silviculture is a group of forestry subjects in which

- **J** we define basic forestry ideas
- **J** we judge the **structure of forest stands** and all the factors which influence it
- J we judge the activities which keep the forest not only as an **ecosystem** and significant **landscape-forming factor** but also as a **stable natural source**.

The **differentiated silviculture** is based on the understanding of the biological, economic and public differences in the forests in Slovakia. For this reason we use the territorial planning of

- J forest areas
- J forest sub-areas
- **J** units of areal dividing of the forest
- J forest seed areas

The differences in the **functional type** are important for the **forest categorisation**. We know the categorisation of :

- **J** the economic forests
- **J** the protected forests
- J the forests of special defining

Answer the questions:

1. How do we define silviculture?

- 2. What is the differentiated silviculture based on?
- 3. What kind of territorial planning do we know?
- 4. What is important for the forest categorisation?
- 5. How do we divide categorisation?

Find these words in the dicionary, translate them and use them in the sentence: Forest stand-.... Landscape-.... Natural source-....

Write the missing letters:	
- O S -	- A - E R A T - O -
T R - T A -	A - N - N -
D - F R - N A D	S - L - I C T E

The origin of the forest and its appearance are important for the judgement of the **shape of the forest.** It can be:

- high / in the seedling forest /
- low / in the sucker forest /
- o conjugated

The **forest typology** deals with the **ecological conditions** and **farming history**. According to this the forests are classified as

- the basic typological units
- the applied typological units

These units are important for making up the models of economy and also for **the forest** economic plans.

Write the correct letter

	Shape of the forest		Type of the forest
1	high	А	seedling forest
2	low	В	mixed
3	conjugated	С	sucker forest

п				
	1	2	2	
	1	4	3	
			-	

Are these sentences true or false? Write T/F

- 1. The forest typology deals with farming future.
- 2. The applied typological units are necessary for the forest economic plans.
- 3. Only the appearance of the forest is important for the judgement of its shape.
- 4. The low shape is in the sucker forest

Read the text silently, read and translate the words and write the number where they belong:

Shelters	material	biological
Species	nurslings	clone
Stands	orchads	soil

Individual forest branches represent the activities which are necessary for the reaching the **economic targets** and for the existence of the forest with the required qualities. The basic branches are:

J Forest seed management – insures sufficient number of qualitative reproductive1....of the required origin. The crop of seeds and fruit is possible only in significant sources

which are: selected trees, seed ...2...and forest stands, significant forest3... for the harvesting, gene basis and ...4... planting

J Forest nursery management – produces planting material of different...5...., origin and way of planting. This material is assigned for the artificial reproduction of the forest by planting in different6....conditions. Seedlings and7....are grown in the mineral8...on the seed beds or in the substratum, under the9....or in the open spaces.

Read the text Forest seed management **and** forest nursery management **again and write it as** a dictation

••••••	••••••	

- J Reforestation it is an artificial reproduction of the forest by plants or seeding. Founding of the forest is the artificial creating of the forest stand on the non-forest ground. Reforestation is carried out by the following activities:
 - **preparation of the areas** we prepare the area for the reforestation by clearing the rests after the felling slash removal and cutting high stems.
 - **preparation of the soil** we change the physical, chemical and biological composition of the soil by **ploughing, digging, mulching**
 - reforestation by planting or seeding we can divide it according to the used technology into:
 hole or lifted planting
 - single or group planting repeated reforestation using free-root or cover-root plants manual or mechanized reforestation slit reforestation by cover-root plants– used in the light or non-weedy soils

Finish the sentences:

1. We use slit reforestation by cover-root plants in
2. We divide reforestation according to the
3. We divide reforestation into hole
4. We divide reforestation into using
5. Reforestation is carried out by three activities: a/
b/
c/
5.Reforestation is an

Read the text again and write five questions for your schoolmates:

1	
2	
3	
4	
5	
	•••••••••••••••••••••••••••••••••••••••

Word formation – write the nouns from the given verbs

Verb	Noun
reforest	
reproduce	
create	
prepare	
remove	
compose	
plough	
dig	
mulch	

Word formation – write the verbs from the given nouns

Verbs	Nouns
	founding
	activity
	clearing
	cutting
	division
	planting
	repetition
	change

Care of the young forest stands – it is a complex of measures by means of which we **make** the forest stand **safe** for its next development. The most important protection is that one against the **weed** and **game**. Tending of the forest stands is very specific because it depends on the **way of the origin of the stand**, its structure, timber, health condition, ecological conditions but especially on the development stage.

- **Ÿ** In **young natural reproduction** and in the **cultures** up to the height of 1.5 m we do the **cutting** and **weeding cutting**
- Y In young forest stands up to the thickness of 7cm these activities are called cleanings out, we carry them out at ground wood with an unstable shape as cleanings and at ground wood with a stable shape as cuttings
- Ÿ In the stands with the thickness more than 7cm we do the thinning. We regularly repeat them up to the phase of the small pole-stage, pole-stage stand or timber forest

Answer the questions:

1. What is the most important protection of the young forest stands?

2.What does tending of the forest stands depend on?
3.Where do we do the thinning?
4.How long do we repeat the thinning?
5.Where do we do the cleanings?

Eight words printed in bold are hidden in the crossword. Find them.

А	В	D	Ν	А	Т	S	С
D	F	0	Ι	Х	W	Q	А
Р	Р	L	Μ	G	Т	С	G
Т	W	Q	А	А	E	L	Ν
Ι	Ζ	Y	0	Μ	Ν	E	Ι
Μ	Y	W	E	E	D	А	Ν
В	Q	А	S	Р	Ι	Ν	Ν
E	L	Κ	J	Η	Ν	Ι	Ι
R	G	F	S	D	G	Ν	Η
С	U	Т	Т	Ι	Ν	G	Т

1	5
2	6
3	7
4	8

Put two correct parts of the sentence together

1	We make the forest stand safe	A	depends on the origin of the stand, its structure, timber and other conditions		
2	Tending of the forest stands	В	we do the thinning		
3	In the cultures up to the height of 1.5 m	С	these activities are called cleanings out		
4	In the stands with the thickness more than 7cm	D	for its next development		
5	In young forest stands up to the	Е	we do the cutting and weeding cutting		
	thickness of 7cm				
1	2 3		4 5		

Read the text Care of the young forest stands again and retell it.

- J Regeneration of the forest stands it is the final stage of the forestry activities. It is realized by felling, but we use also the natural processes. If the regeneration felling corresponds with the natural processes, the result is the natural regeneration. We can complete this by artificial planting of woody plants which were not regenerated. There are some characteristic concepts for the individual regeneration cuttings:
 ÿ regeneration factor area of the stand where
 - regeneration factor area of the stand where we carry out the felling
 resource of regeneration area where we start the regeneration
 total period of regeneration time of the regeneration

How many words can you find in this line?

RESOURCE REGENERATION FELLING CUTTING PROCESS NATURAL STANDFOREST

Read the definitions below, then write the word they describe. The first letter of each word is given to help you:

- 1. something that is done to make something develop, improve or grow strong again r....
- 2. cutting down the trees f.....
- 3. a series of events or changes that happen naturally p.....
- not natural but made by people a.....
 nort of the forest
- 5. part of the forest s.....

Read the words and write their definitions:

1.	activity
2.	result
3.	woody
4.	area
5.	total

Write the opposites of the words, you can find them in the text:

	Opposite
the first	
period	
finish	
collective	

According to the fact if the regeneration is done on the clearings or under the protection of the parent stand and according to the time of regeneration we distinguish :

- **Ÿ** clear felling system it is based on the single-shot deforestation. The time of regeneration is short and it is done by the artificial reforestation. Only sunloving plants are naturally regenerated
- Y shelterwood system it is based on the gradual thinning (lowering of the stand density). The time of regeneration is short or long and we provide 2 or 4 measures on the regenerated items. The result is the natural regeneration of the commercial species both semi-shade-loving and shade-loving. Mixed stands and stands of growing space originate like this.
- ÿ selection system is based on the continuous regeneration and existence of all development stages in the stand. The cuttings are weak and the result is the stand with a very rangy structure. In regard to the increasing ratio of the protection forests and forests of special defining as well as to the worsening ecological conditions there is the need to increase the regeneration of the forest or to grow the natural forest.

Circle the correct answer:

1.Clear felling system is b	ased on					
a/ gradual thinning	b/single-shot deforestation	c/ continuous regeneration				
2.The structure of the star	nd in the selection system is					
a/ very rangy	b/ high	c/ thin				
3.Mixed stands are based	on the					
a/ shelterwood system	b/ clear felling system	c/ selection system				
4.The cuttings in the selec	tion system are					
a/ strong	b/ low	c/ weak				
5.Naturally regenerated a	re only					
a/ sun-loving plants	b/ shade-loving plants	c/ semi-shade-loving plants				
Answer the questions:						
1.What are three important	factors for the distinguishion of th	e systems?				
2.How would you character	rise clear felling system?					
3. How many measures are made in the shelterwood system?						
4. What is the result of these measures?						

5. What kinds of stands originate like this?

One word in each sentence is wrong. Write it correctly:

1.Selection system is based on the continuos regeneration
2. The cuttings are week
2 There are worsening exclosical conditions
4.2 1 Line are worsening ekological conditions
4.Sun-loving plants are naturally regenerated
5. The result is the natural regeneration of the comercial species

Finish the expressions:

Ecological	rangy	single-shot
Forests of	natural	gradual

Write about ten sentences on what you remember about the reforestation systems

•••••	• • • • • • • • • • • • • • • •	•••••	• • • • • • • • • • • • • • • • • • • •	•••••	• • • • • • • • • • • • • • • •	•••••	• • • • • • • • • • • • • • • • •	•••••	• • • • • • • • • • • • • • • •	• • • • • • • • • • • • • •	• • • • • • • • • • • • • •	•••••
•••••	•••••				•••••	•••••	••••••		•••••	•••••	•••••	•••••
					•••••		••••••			•••••	•••••	•••••
					•••••		•••••				•••••	



6.1 Vocabulary:

Silviculture	Judge	Forest stand
Influence	Ecosystem	Significant
Landscape-forming	Stable	Source
Differentiated	Reason	Territorial
Planning	Dividing	Seed areas
Functional type	Categorisation	Protected
Forests of special defining	Origin	Appearance
Judgement	Shape	Seedling
Sucker	Conjugated	Typology
Deal with	Farming	According to
Applied	Make up	Branch
Necessary	Rech	Target
Require	Seed management	Sufficient
Nursery management	Reproductive	Possible
Selected	Crop of seeds	Harvest
Gene basis	Planting	Assigne
Atificial	Different	Condition
Grow	Mineral	Seed bed
Substratum	Reforestation	Found
Create	Non-forest	Carry out
Follow	Clear	Rests
Felling	Slash	Removal
Cutting	Stem	Soil
Composition	Plough	Dig
Mulch	Hole	Lifted
Use	Repeat	Free-root
Cover-root	Manual	Slit
Light	Non-weedy	Care
Measure	By means of which	Make safe
Development	Weed	Game
Tending	Depend on	Timber
Height	Thickness	Cleaning out
Ground wood	Unstable	Thinning

Regularly	Small pole-stage	Pole-stage
Final stage	Felling	Process
Correspond	Natural	Woody plants
Concept	Total period	Parent stand
Distinguish	Clear felling system	Single-shot deforestation
Sun-loving plants	Shelterwood system	Gradual thinning
Lower	Stand density	Provide
Item	Commercial species	Semi-shade-loving
Shade-loving	Selection system	Continuous
Development stages	Weak	Rangy
In regard to	Increasing ratio	Worsening
As well as	Need	

7. FOREST PROTECTION

Forest protection is a general term describing methods aimed at preserving or improving a forest threatened or affected by abuse. It deals with the origin, signs and effects of damage to forest caused by damaging factors.

Read the text and fill the words into the gaps:

protected	population	clearir	ng species	pollutio	n
endan	gered	forest	nutrients	wildlife	declining

is dying. 40,000 species are now worldwide, mainly because of habitat destruction. The forests help regulate our planet's temperature, provide us with oxygen and absorb Our forests are our great supply of and homes for all species including humans. As we know before the city there was a we just cut it down to build within it. With the rapid increase in world the amount of forest is...... Therefore, considerable effort is needed to increase the productivity of the existing forests. We need to open our eyes to our behavior, our actions towards our forests: when choosing locations for construction, for forests for farming or just plainly for profit. Mainly locations that involve forests, rivers, or under threat should be

Write another possible ways and solutions to help to protect our forests and nature:

Improving of forest protection system using high-efficient methods, substances and technologies will make a positive effect on forests and forest resources.

7.1 Anthropogenic and Natural factors

Anthropogenic factors are human activities that change the environment. Anthropogenic factors that can affect forest include:

• logging, urban expansion, human-caused forest fires, acid rain, invasive species, and the practices of agriculture or cultivation.

There are also many **natural factors** that can cause changes in forests over time including:

• forest fires, insects, diseases, weather, competition between species

Which factors belong to anthropogenic and to natural factors. Write them to the right column and translate them:

bark beetles wildfires animal agriculture drought air pollution residential development logging spruce budworm invasive insects cultivation parasites acid rain emissions from fossil fuel gypsy moth snow storm defoliator deforestation frost aphid land use tussock moths avalanches

anthropogenic factors	natural factors

How many anthropogenic and natural factors can you find in this line?.

${\bf MNINSECTSOKLOGGINGECWEATHERUTCULTIVATIONFEDISEASESDALANDUSEOL}$

7.2 Biotic and Abiotic factors

Biotic *factors* are those factors which are living or simply the *animals*, *plants*, *fungi*, *bacteria* and the *decomposers*, etc.

Abiotic factors are non-living chemical and physical factors in the environment, such as *soil*, *pH*, *forest fire*, etc.

Abiotic factors may be grouped into the following main categories:

Climatic factors which include the climatic regime and physical factors of the environment like *sunlight, humidity, atmospheric temperature, air pressure, wind, rainfall*, etc.

Edaphic factors which are related to the structure and composition of soil including its physical and chemical properties, like *soil* and its *types, soil profile, minerals, organic matter, soil water, soil organisms.*

Inorganic substances like water, carbon, sulphur, nitrogen, phosphorus and so on.

Organic substances like proteins, lipids, carbohydrates, humic substances etc.

Much of the forest destruction comes from climatic abiotic factors: wind, snow and frost.

Data from 2007 displayed that they caused damage on 2 981 000 cubic metres of wood in Slovakia. One of the most dangerous degenerative change is the wind calamity. It caused in the High Tatras the ravage of 12.600 hectares of forest ecosystems in the High Tatras National Park (TANAP). Mostly artificially planted forest ecosystems were damaged. Big snow storm have also caused serious damage to forests, especially in north and central Slovakia.

Fill in the right letters and translate the words:

Other **abiotic** factors are:

HVY _AI_F_L_S
H_G_ TEER_T_RE
W_NTOS
_ O W T P _ R A_ U_ ES

A _ AL _ N ES	G C I _ RS
$H_R_IC_ES$	_RO_G _TS
_ L _ ODS	F_OS

7.2.1 Biotic factors

Trees are, of course, also threatened by more "natural" causes, such as **pests** and **diseases**. Diseases and pests are the major biological determinants of forest productivity. In large numbers, insects can kill trees, often by eating their leaves. Diseases can wipe out entire populations of tree species.

Therefore, protection of forests against pests and diseases needs world-wide attention. The problem in any region cannot be viewed in isolation but must be seen in a global context. Cooperative efforts should be stimulated, regionally and internationally. Particular emphasis should be put on the creation of regional institutes for forest diseases and insect pest research.

Are these sentences true or false T/F ? If they are false, correct them.

Diseases and pests are not dangerous for forests.

.....

Diseases and pests influence the forest productivity.

.....

Insects can kill trees by eating their fruits.

.....

Forest protection needs only local attention.

.....

We should put special emphasis on the creation of regional institutes for forest diseases and insect pest research

.....

Generally the healthier the forest, the more resistant it is to widespread pest attack. Overmature, weak, wind-thrown, and lightning- or fire-killed trees have little or no defense against infestation and pest populations. Every part of a growing tree—root, trunk, bark, leaf, flowers, and seeds—can be potentially attacked by some harmful insect or fungus.

Enormous numbers and varieties of insects, fungi, bacteria, and viruses occur in forests and are adapted to live on or around trees. They attack trees chiefly by clogging the flow of sap, killing the leaves, or rotting the roots or wood. Insects that damage trees include *bark beetles* (they feed on a tree's bark) *sucking insects* (aphids and scales that suck the fluid from trees and feed on all types of trees) and *defoliators* (*spruce budworms, tussock moths, gypsy moth* that eat leaves).

Rearrange the letters and write the words (insects) correctly. Translate them into Slovak:

1. HIDAP	
2 . ACLES	
3. CERUSP WORBUDM	
4. COSSUTK TOHM	
5. KRAB TELEBE	
6. PYGYS MHOT	

Find all the biotic and abiotic factors (17) in this crossword.

А	G	Е	V	Ι	R	U	S	Е	S
В	Y	М	R	0	W	D	U	В	U
А	Ρ	Н	Ι	D	S	S	V	А	Ν
С	S	U	S	Ν	0	W	Т	L	В
Т	Y	R	А	Ι	Ν	F	А	L	L
Е	М	0	L	W	F	R	0	S	Т
R	0	F	Ι	R	Е	L	V	Т	С
Ι	Т	F	U	Ν	G	Ι	D	S	Е
А	Н	D	Ι	S	Е	А	S	Е	S
Н	U	М	Ι	D	I	Т	Y	Ρ	А

Biotic factors:	1	4	7
	2	5	8
	3	б	
Abiotic factors:	1	4	7
	2	5	8
	3	6	9

7.3 Fungi

Most fungi are not parasites, and very few types can harm trees. Most are actually beneficial. There are exceptions, however, For example, some fungi, such as *bracket fungi*, can be found growing in living trees. Instead of growing strands through the soil, they grow under the bark of the tree, taking nutrients from the host.

Several fungal diseases, sometimes called *heart* or *sap rots*, cause the wood in the center of trunks and limbs to decay. Decomposition of wood that is caused by fungi is called a *decay*. Almost all species of woody plants are subject to trunk and limb decay. When it attacks living plant tissue, it kills the plant.

Trees are predisposed to decay by wounding caused by insects, weather, fire, animals, and human activity such as logging. We can minimize wood decay by growing species adapted to the site and by protecting trees from wounding.

Do these activities: -read the text about fungi again

-write it as a dictation
- correct it
- retell the text

Read the text and answer the questions:

7.4 Tactics directed against the pest or disease

Routine **monitoring** of insects and diseases allows foresters to indicate infested trees and to limit the spread of the problem to uninfested trees or areas. Also trees that may cause personal injury or property damage if they fall should be regularly inspected by a qualified expert for signs of wood decay and other structural weakness. Hazardous trees may need to be trimmed, cabled, braced, or removed.

When animals shed their antlers, browse, or nibble on buds, twig-ends, and leaves of woody plants, shrubs and trees can be deformed, stunted, or, in the case of young plants, eaten completely. There are several options for keeping animals away from trees. Trees can be surrounded with fencing or other suitable barriers to protect trees. **Traps** baited with sex-attractant chemicals, or pheromones, are a method to reduce breeding populations of certain insects. Common paper sticky traps reduce the local population and limit the damage insect causes. Various types of paper, plastic wraps or sheep wool can be placed directly around the trunk of small trees to prevent animal damage.

Tactics directed against the pest or diseases are referred to as **direct control** or suppression tactics. Examples include various types of biological, mechanical or chemical methods. Various types of fences, repellents, and frightening devices can be used to protect trees and reduce damage. **Pesticides** include all materials that are used to prevent, destroy, repel, attract or reduce pest organisms. Pesticides are grouped or classified according to the

pests they control, their chemical structure, how/when they work, or their mode of action (site of action). Insecticides, herbicides, fungicides and rodenticides are some of the more well-known pesticides. But the chemicals can upset the ecological balance of a forest and so they are generally used only if other controls fail to stop pests and disease.

Severe outbreaks of **insect pests**, however, are rare, and occur much less frequently in natural forests than in "managed" ones. Most insects have their own natural enemies, which can usually keep their numbers low enough that they do not cause a problem. The normal population levels of pest organisms result in limited reduction in tree growth or the total destruction of only a small number of trees in the forest. The losses are generally accepted by foresters as unavoidable and are tolerated as long as the annual destruction does not seriously affect the annual increase in wood production.

Why is forest monitoring important for preserving trees?

What should foresters do with hazardous trees?
How can animals deform and stunt trees?
What examples of traps to protect trees are commonly used?
Which type of trap have you seen in forest?
Give some examples of direct control against the pest or diseases.
Which criteria are used to distinguish pesticides?
When is the population of pests generally accepted as tolerable?

When do forests become really endangered by pests attack ?

.....

7.5 Human-caused forest destruction

People have been destroying forests for hundreds of years, but the rate of destruction has been increasing so rapidly that some forests will not last much longer. The role of humans in the deforestation of the world's forests is considerable and extensive. Many activities contribute to this loss including, logging, mining, fires, oil extraction, war, commercial agriculture, cattle ranching, hydroelectric projects, pollution, hunting and poaching, the collection of fuel wood and building material, and road construction. Much of the human-caused forest destruction comes from overpopulation. In many places, there are too many people trying to make a living from too few forest resources. As cities expand, forests are cleared to make room for housing developments, shopping centres, cultural and sport facilities and other structures that require large amounts of land. In certain, especially industry areas forests are declining because of air pollution. This pollution is from the fossil fuels burned in vehicles -- cars, trucks, buses -- and from industry.

Discuss in pairs:

What are the most common ways of destructing forests by people?

What are the most dangerous human activities destroying forests?

What are the less dangerous human activities destroying forests?

Are there any solutions to prevent the effects of human activities on forests?

7.6 Nature protection in Slovakia

Hn sgd Rknu`j Qdot aktb sgdqd hr`ant s nmd sghqe ne sgd hnelf dmnt r rodbhdr ne ok msr hm rnl d kdudk ne dmc`nf dql dms-Sgd l nrs ne bqhshb`kkx dmc`nf dqdc rodbhdr ne eknq``mc e`t m` hm sgd Rknu`j Qdot aktb bnl dr eqnl almsnodr+v glbg `qd f kna`kkx dmc`nf dqdc hm v gnkd bdmsq`k Dt qnod- O`qshbt k`qkx oqnsdbsdc `mhl `kr `mc ok`ms rodbhdr+l hmdq`kr `mc enrrhkr `qd sgnrd rodbhdr or subspecies which are very rare, generally endangered, scientifically or culturally important. S gd sns`k`qd` ne oqnsdbsdc `qd`r hmRknu`j h`+hmbkt chnf oqnsdbsdc ynndr+bnudqr l nqd sg`m11\$ ne sgd v gnkd sdqphsnqx ne Rknu`j h`-

There are **nine national parks**: Tatras National Park, Pieniny National Park, Low Tatras National Park, Slovak Paradise National Park, Low Fatra National Park, Muránska Plain National Park, Poloniny National Park, Slovak Karst National Park and High Fatra National Park, and **fourteen protected landscape areas** in Slovakia: Little Carpathians Protected Landscape Area, White Carpathians Protected Landscape Area, Cerová vrchovina Protected Landscape Area, Dunajské luhy Protected Landscape Area, Horná Orava Protected Landscape Area, Kysuce Protected Landscape Area, Latorica Protected Landscape Area, Poľana Protected Landscape Area, Ponitrie Protected Landscape Area, Strážov Mountains Protected Landscape Area, Štiavnica Mountains Protected Landscape Area, Vihorlat Protected Landscape Area, East Carpathians Protected Landscape Area,

Záhorie Protected Landscape Area.

The main functions of national parks include protection of natural processes, regulation of tourism, environmental and ecological education.

V nqj hmo`hqr-Bknrd xnt q annj r`mc v qhsd`r l`mx m`shm`k o`qj r`mc oqnsdbsdc k`mcrb`od`ad`r`r xnt b`m9

V nqj hm f qnt or - V qhsd sgd dw'l okd ne rnl d q`qd`mc oqnsdbsdc`ml`kr`mc ok`ms rodbhdr+l hndq`kr`mc en rrhkr-

7.7 Vocabulary:

forest protection	invasive insect	threatened
gypsy moth	affected	emissions
abuse	fossil fuel	damaging
aphid	clearing	defoliator
species	deforestation	pollution
frost	endangered	tussock moth
nutrients	avalanche	wildlife
biotic	declining	fungi
habitat	decomposer	destruction
abiotic	supply	humidity
considerable	atmospheric temperature	substances
air pressure	anthropogenic	edaphic
logging	carbon	urban expansion
sulphur	invasive	nitrogen
cultivation	phosphorus	bark beetles
proteins	drought	lipids
residential development	carbohydrates	air pollution
humic substances	spruce budworm	ravage
parasites	artificially	acid rain
glacier	drought	spread
hurricane	uninfested	pest
inspected	disease	sign
resistant	weakness	widespread
hazardous	overmature	trimmed
defense	cabled	infestation
braced	clogging	removed

flow	shed	sap
antler	rotting	browse
bark beetle	nibble	sucking insect
bud	aphid	shrub
scale	deformed	defoliator
stunted	harm	fencing
beneficial	barrier	bracket fungi
trap	heart rot	baited
sap rot	sex-attractant	limb
pheromone	decay	breeding
decomposition	sheep wool	plant tissue
suppression tactic	predisposed	repellent
wounding	frightening device	monitoring
pesticide	infested	prevent
destroy	contribute	repel
mining	attract	oil extraction
reduce	cattle ranching	insecticide
hunting	herbicide	poaching
fungicide	overpopulation	rodenticide
resource	outbreak	decline
managed	fossil	loss
indigenous	unavoidable	endangerment
annual	fossil	considerable
subspecies	extensive	rare

8. FOREST HARVESTING

Forests

Slovakia is a mountainous and forested country – about 40 percent of the country is covered in forest. Forests have many values, they provide crucial sources of oxygen, food, are home to many species, help to slow global warming, reduce the greenhouse effect, clean water. They are sources of wood products and also immense recreational, aesthetic, and spiritual benefits for millions of people. Many factors – changing climate, wildfires, insect outbreaks, timber harvest, roads, and urban development destroy forests.

8.1 The structure of wood

Trees are a part of the natural vegetation of the earth and need only sunlight, water, nutrition and time to grow. Wood is an inexhaustible raw material. After a forest is felled, new trees can be planted, that can grow out to a mature tree.

Wood has a very complex anatomy. All trees are made up of cells that are responsible for storage, absorption of nutrients, growth and strength. The size or arrangement of the various cells is one of the best means of distinguishing one class from another and also of distinguishing different woods of the same class.

```
Do these activities: Student A

-read the text 'Forests' and dictate it to student B

-correct it

Student B

-read the text 'The structure of wood' and dictate it to student A

-correct it
```



Write the right heading- (wood tissue)- to its definition.

against physical and biological damage, and helps moderate trunk and stem temperatures.

..... tissue is a vascular system located between the bark and cambium. Phloem is a series of connected cells designed to transport growth regulators, sugars, and carbohydrates throughout the tree.

..... is a layer of tissue between the inner bark and wood of a tree that produces new bark and wood cells. It forms **annual rings** in trees- these so-called rings are not lines, but small cells and fibers produced during the summer. It takes one year to produce a ring; therefore, by counting the number of rings at the end of the log, the age of the tree from which the log was cut can be determined.

.....tissues form inward from the cambial layer, developing a second vascular system. Xylem is a woody tissue in plants that helps support the plant and carries water and nutrients.

.....is the light-colored outer and active layers of wood. It provides transport, storage, structural support, and protection and defence against decay pathogens. It is usually lighter in color than hardwood.

..... is the dark-colored inner and inactive layers of older xylem. The main function of heartwood is to provide structural support for the tree.

.....exists just beneath the bark of a tree, and is easily damaged. Any damage to the vascular system can have a major negative effect on tree health.

8.2 Sorting and grading

Wood is a material that can be used instantly and only needs a few preparatory treatments. It is manufactured in the forest. It only has to be sawed into the correct sizes and, if needed, to be assembled. The sawn and trimmed **rough timber** is sorted according to thickness, width, length, quality, grade and species depending on the market requirements. Grading is a means to segregate the lumber according to the quality, direction of grain, presence of knots and defects, as well as general appearance, etc. Logs of suitable dimension and quality for slicing and peeling are generally sorted in the log-yard, according to size and species.

Wood quality requirements can be grouped into five main categories:

- Strength (stiffness, tensile and compression strength, hardness)
- **Stability** (low distortion, shrinkage, collapse)
- **Biological performance** (consistent colour, durability)
- Manufacturing performance (good gluability, machining)
- Log processing performance (low splits, low distortion)

There are very few pieces of perfect timber. Even though great care is taken to avoid or minimize defects when sawing the wood to the required sizes, there are almost always some defects present. The number and location of these defects determines the grade of the timber.

Answer the questions:

Explain the term grading.

.....

What are typical criteria that help to sort rough timber.

.....

Write some wood qualities used to sort the timber into grades.

.....

8.3 Defects

@ cdedbs hm v nnc 1 `x ad cdehndc `r `mx `annql `khx nq hqqdftk`qhx sg`s9 knv dqr hx bnl 1 dqbh`ku`kt d ax cdbqd`rhnf hxr rsqdnf sg nq ax `eedbshnf hxr pt`khxhdr nq hxr `ood`q`mbd-

Defects may be naturally occurring or can be man-made.

Natural defects can be due to many reasons such as environmental factors, growth patterns, soil composition, etc. Most of cdedbsr `qd b`t rdc ax nt srhed enqbdr rt bg `r v hnc `mc eqnrs nq `qrd`r` qdrt ks ne sgd hnqn`cr ne nqf`nhrl r rt bg `r et nf h+hnrdbsr-

Man-made defects develop as a bnmrdpt dnbd ne sgd H oqnodq g`nc kmf ne sgd v nnc ct qmf 1 `nt e` bst qd- S gdx can occur from the felling of the tree, transport, storage, sawing, drying, etc.

V d b`mchuhed v nne e`t ksr¹nq ededbsr hnsn9

- Knots
- Cracks
- Shape defects
- Build defects
- Tints
- Decays
- Mechanical defects

Are these sentences true or false T/F? If they are false, correct them.

Defects are properties of wood that increase its quality.

.....

Defects are divided into two groups: natural defects and man- made defects.

Diseases, snowstorm, hurricane and fungi are examples of man-made defects.

Which defects belong to natural and man-made defects. Write them into the right column.

anv	blue stain	n v`md	bg dbj	tight knot	bqnnj	pitch	rg`jd
l`bghn	nd at qm	loose knot	spalt	rolts	bt o	sv hrs	wormhole

Natural defects	Man-made defects	

Identify and write down the defects to the pictures:





⁰²חחחחח - הרחח - הרחח - 10





⁰³הההההההה⁰³

04 ח ח ח ח ח ח ח ח ח

8.4 Harvesting

Harvesting is planned to ensure the forest is constantly renewed. Priority is given to sick and injured trees. The elements that influence harvesting are: work force, working instruments and equipment, work environment and wood. The start of harvesting is the cutting down of trees with hand tools, chain saws, or mechanized felling machines. The tree may be further cut into suitable lengths (bucking), or it may be transported whole or in tree-lengths.

There are 4 chief methods of harvesting timber.: a. clearcutting,
b. seed tree cutting,
c. shelterwood cutting
d. selection cutting.

Each cutting method is also a way of replacing the crop. New trees grow from seeds produced by the remaining or surrounding trees, from sprouting stumps, or from seeds and seedlings that foresters plant.

Clearcutting, or **clearfelling** is a logging practice in which most or all trees in a harvest area are cut down. This method of logging can destroy an area's ecological integrity.

Seed tree cutting involves removing most trees from a stand and leaving only a few trees behind to produce seed for regeneration of an even-aged forest.

Shelterwood cutting is used in even-aged forests (where the trees are very close in age) and relies on natural regeneration to re-establish the stand. The objective of shelterwood cutting is to use older, mature trees in a stand as a protective cover over a developing even-aged stand of new trees.

Selection cutting is used to maintain uneven-aged stands (where the trees are all different ages). The forest regenerates naturally, with the young trees and seedlings benefiting from the protection of existing trees.

Its purpose is to ensure that the forest contains trees of all ages. It also improves the health of the stand and releases space for young trees to grow.

Identify and write down the method of harvesting:



<u>8.5 Tree felling</u>

Felling – Separating the tree from the stump near the ground, usually with an axe, chain saw, or specialized machine. To "fell a tree" means more than just cutting it down. Felling means to cut the tree in such a way that it falls in the desired direction and results in the least damage to the tree.

There is one incorrect information in each sentence. Find it and correct it.

Tree felling refers to the process of transporting felled trees. Tree felling is commonly performed with mobile felling machines. Seed tree cutting is felling and removal of all trees from a given tract of forest.

.....

The main aim of shelterwood cutting is to use new trees to provide shelter to old trees.

.....

Clearcutting involves clearing an area of trees taking into consideration their size and usability.

.....

Shelterwood cutting is used when the majority of trees are cleared from a stand with a few select ones remaining as seed trees.

.....

The purpose of selection cutting is to ensure that the forest contains trees of the same age.

.....

8.6 Tree logging

Logging is the process in which certain trees are cut down for forest management and timber. The logging system used to fell trees and remove the logs is influenced by factors such as the slope of the land, softness of the soil, size of the area to be harvested and the quality of access.

The timber-cutting and logging process is carried out by a **logging crew**. A typical crew might consist of one or two tree fallers or one tree harvesting machine operator to cut down trees, one bucker to cut logs, two logging skidder operators to drag cut trees to the loading deck, and one equipment operator to load the logs onto trucks.

Tree fallers, cut down trees with *hand-held power chain saws* or *mobile felling machines*. Usually using *gas-powered chain saws*, *buckers* trim off the tops and branches and buck (cut) the resulting logs into specified lengths. **Choke setters** fasten chokers (steel cables or chains) around logs to be skidded (dragged) by tractors or forwarded by the *cable-yarding system* to the landing or deck area. Then the logs are separated by species and type of product, such as pulpwood, saw logs, or veneer logs, and loaded onto trucks.

Yarding is the logging operation that moves felled trees from the slash pile to the landing or storage area prior to transportation.

Explain these words in English to your classmate, who will try to guess it and translate it into Slovak:

logging
logging crew
tree faller
hand-held power chain saws
bucker
chokers
skidded
pulpwood
truck
yarding
slash pile

8.7 Personal protective clothing and equipment

Read the text and fill the words into gaps:

glasses	knee	trousers	gloves	shirt or jacket
1	raincoats	ear protection	boots	helmet

Workers should wear:

- 1. long-sleeved....., preferably in a warning colour, fitting neither too loosely nor too tightly.
- 2. chainsaw protective to protect the legs from a moving saw blade.
- 3. protective boots with non-slip soles.

In felling operations, the worker must wear:

- 4. safety with ventilation holes
- 5. chainsaw protective to protect the hand in case of a woodcutting mishap.
- 6. protective with non-scratch, clear lenses
- 7. to prevent the steady loss of hearing that occurs when using chainsaw.

During the felling of large-sized trees, it may be advisable to use:

8. protectors.

During rainy periods, workers should have:

rubber
 10.

8.8 Harvesting techniques

Manual wood harvesting operations

This is the most basic harvesting technique that exists. Trees are felled by hand or powersaws, delimbed and crosscut and extracted manually, often by gravity on steep terrain. Many types of pushing, pulling and rolling operations have been developed and existed for many years.

Low-level mechanization

Felling, delimbing and bucking carried out manually, wood extraction and transport by means of animals.

Medium-level mechanization

Felling, delimbing, bucking by chainsaws. Wood extraction and transport is carried out by specialized machines, such as agricultural tractors with forestry attachments, skidders. crawler tractors, cable systems, winch lorries and timber trucks.

High-level mechanization

Felling by chainsaws, all other work such as wood extraction, delimbing, crosscutting and debarking is carried out by machines.

How many machines can you find in this line?

YWINCHLORRYJECRAWLERTRACTORDATIMBERTRUCKWNAAGRICULTURALTRACTOR

Match the word with the right definition:

skiddingmoving of logs to a landingyardinglog-carryingforwardinglog-dragging

8.9 Transporting logs

Felled logs are generally transported to a sawmill to be cut into timber, a paper mill for paper pulp, or for other purposes. Many methods exist to transport felled logs: **cable logging** involves a **yarder** which pulls logs along the ground to a **truck**.

Humans, animals, **crawler tractors** and **wheeled skidders** (machines that drag the logs), **forwarders** (machines that carry loads of logs), **farm tractors** with winches or trailers, **semi-trailers**, **cable logging systems**, **balloons**, or even **helicopters** transport logs and tree products to landings. At the landing, the logs or trees may be stored or directly processed for transport. They may be loaded onto **trucks**, **trains**, **barges**, or **ships**. When the terrain is too uneven to pull logs on the ground, a **skyline** can lift logs off the ground vertically. Heavy-lift helicopters, may be used when cable logging is not allowed due to environmental concerns or when roads are lacking. Helicopters are the most expensive form of log transport. Less common forms of log transport, or methods used previously include horses, oxen, or balloon logging.

Rearrange the letters and write the words (means of transport) correctly:

ALBOLON	 HSPI	
KUTRC	 LITERHECOP	
RITAN	 RSOHE	

Fill in the missing letters in these words (means of transport) and translate them into Slovak:

SD_E	BGE
_X_N	FW_RD_R
_KYN	T_AR

8.9 Storage of timber

A **depot** is a place where wood or other forest produce is stored. Depots may be for minor or for major forest produce. The advantages of depots are: better interaction between network of services (forestry and wood harvesting systems), the concentration of forest produce (suitable conditions for the usage of mechanization equipment and harvesting technique), complex mechanization and automation of some works (saving workforce), concentration of work and workers (improving of workers' social conditions and better business conditions).

The depots can be broadly classified as:

Forest depots

Forest depots are those where the forest produce is kept in the forest to be delivered to the purchaser. These depots are intended chiefly for collection and checking of produce before dispatch from forest.

Transit depots

Transit depots are those inside or outside the forest, where the forest produce is temporarily stored pending its dispatch to destination.

Sale depots

Sale depots are those depots where the timber or other forest produce is stored pending its disposal by sale. Sale depots are generally near the markets or from where the timber can be easily transported.

Finish the sentence:

Forest depots are those
Transit depots are those
Sale depots are those

8.10 Vocabulary:

forest harvesting	trunk	value
stem	crucial	tissue
source	layer	slow
annual rings	global warming	fiber
greenhouse effect	log	immense
determined	spiritual	pathogens
benefit	sorting	insect outbreak
grading/grade	timber harvest	preparatory
urban development	treatment	nutrition
sawed	inexhaustible	assembled
felled	sawn/saw	cell
trimmed	storage	rough timber

absorption	sort	nutrient
thickness	arrangement	width
cambium	length	xylem
requirement	sapwood	segregate
vascular system	lumber	bark
grain	heartwood	knot
phloem	defect	defence
appearance	moderate	dimension
slice	occur	peel
crack	strength	shape defect
stiffness	build defect	tensile
tint	compression strength	decay
hardness	mechanical defect	stability
anv	low distortion	blue stain
shrinkage	v`md	collapse
bgdbj	biological performance	consistent colour
tight knot	durability	bqnnj
manufacturing performance	gluability	pitch
machining	rg`j d	low splits
log processing performance	low splits	1 `bghmd at qm
avoid	lose knot	determine
spalt	`amnql`khax	rokhs
hqqdf t k`qhsx	bt o	`ood`q`nbd
sv hrs	due to	wormhole
growth pattern	harvesting	soil composition
ensure	`drd	constantly
et nf h	hand tool	bnmrdpt dmbd
chain saw	handle	bucking
mobile felling machine	logging crew	clearcutting
seed tree cutting	shelterwood cutting	selection cutting
crop	tree faller	seed
bucker/ buck	remain	sprouting stump
logging skidder operator	loading deck	seedling
equipment operator	forester	load

stand	even-aged	truck
trim off	re-establish	protective
mature	specified	develop
choke seter	maintain	fasten
uneven-aged	regenerate	choker
steel cable	improve	chain
release	skid	axe
drag	removal	forward
consideration	cable-yarding system	size
landing /deck area	usability	separate
forest management	pulpwood	slope
saw log	softness	veneer log
access	slash	yarding /yarder
pile	equipment	winch lorry
cable logging system	protective clothing	raincoat
timber trucks	ear protection	wood extraction
helmet	debark	long-sleeved
sawmill	saw blade	paper pulp
non-slip sole	wheeled skidder	ventilation holes
forwarder	woodcutting mishap	trailer
non-scratch	semi-trailer	clear lenses
store	steady loss	processed
advisable	barge	rubber
uneven	delimbed/ delimb	skyline
crosscut	lack	extracted
previously	steep terrain	oxen
push	interaction	pull
network	roll	suitable
develop	automation	intend
low-level mechanization	medium-level mechanization	purchaser
high-level mechanization	dispatch	agricultural tractor
disposal	forestry attachment	forest depot
skidder	transit depot	crawler tractor
sale depot	elevation	