

## **Result of Sample Tree Enumeration of Roha Forest Division**

Roha forest division is one of the forest divisions of Thane circle. The forest extends over an area of 571.36 sq. kms. The forest areas of Roha Forest Division lie between latitude 17° 50' and 18° 35' north & longitude 72° 50' and 73° 38' East. The track is bounded as follows :-

North :- Alibag Forest division

East :- Bhor Sub division & Satara Division.

South :- Chiplun Sub division .

West :- Coastal area of Arabian Sea

**Climate:-** The rainfall is heavy. The bulk of the rainfall i.e. about 95 percent is received from South West Monsoon. The rainfall is not uniform in all the parts of division

**Description fo the Forests:-** The major portion of the forest areas belongs to the formation “South Indian Moist Deciduous Forests” and remaining to “Southern Sub- Tropical broad leafed forests” southern tropical semi – evergreen Forests “Tropical Riparian Fringing Forests” and “Tidal Swamp Forests as per Forest Types of India by Champion & Seth

**Forest Area:-** According to Management & Legal Status, as per Annual Administration Report, the details of forest area of Roha Division as on dated 31/3/2015 are as follows.

**Table No-1**  
**Classification of Forest area according to Management & Legal status**  
**(Area in Sq. km.)**

Sr. No.	Controlling Agency	Reserved forest	Protected forest	Un-classed forest	Total
1.	Area in charge of Forest Department	380.60	31.30	116.81	528.71
2.	Area in charge of F.D.C.M.	---	---	---	---
3.	Private Forest brought under possession of Forest Department	42.65	0	0	42.65
4	Area in charge of Revenue department	---	---	---	---
Total		423.25	31.30	116.81	571.36
% to total forest area		74.08	5.48	20.44	100

Roha forest division consist of six **Ranges** namely Roha, Mangaon, Mahad, Murud, Mhasala, Shrivardhan . The area under Scientific Management as recorded in Working Plan (2003-04 to 2012-13) by Shri Y.L.P.Rao, I.F.S. Dy. Conservator of Forests, Working Plan Division, Pune is as under

**Table No.2**

Sr. No	Name of Ranges	Total area in (ha)
1.	(1)Roha,(2) Mangaon (3)Mahad (4)Murud (5)Mhasala (6) Shrivardhan	56880.836

Now Dy.Conservator of Forest, Roha, has proposed following working circlewise forest area, for sample tree enumeration.

**Table No.3**

**Working Circle wise Area proposed for tree enumeration**

Sr. No.	Name of working circle	Population area in ha
1	Protection Working Circle	30929.630
2	Plantation Management Working Circle	7457.155
3	Improvement Working Circle	10536.763
Total		48923.548

## Sampling plan of Tree Enumeration

Actually the tree enumeration work was done by Deputy Conservator of Forests , Roha Division in 2013-14. The entire forest division's area was considered for sampling enumeration plan. The trees are enumerated in girth classes started from 15-30 cms to Above 150 cms. The girth is measured at breast height (g.b.h.).

The statistical sampling method namely "Systematic Line Plot Sampling with Random Start" was used for tree enumeration. The plot size 60 meters x 60 meters, was found to be suitable with the least standard error. The complete enumeration of trees, Natural regeneration, Grass and Medicinal species were carried out in these plots. Similarly qualitative measurements were also carried out.

On scrutiny of data and preparation of results i.e. (1) Stock per hectare was calculated and the result are being reported in the form of following statements.

Statement I : Estimated growing stock- No. of Sound trees in population area.

Statement II : Estimated growing stock- No. of Sound trees per ha.

Statement III : Percentage distribution of total stock of species over all girth classes.

Statement IV : Percentage of stock of species in a girth class to the total stock in that particular girth class.

Statement V : Estimated growing stock - volume in cum./ha.

Some noteworthy result on current enumeration is described in following Table No. 4(a)

**Table No. 4 (a)**  
**Statement showing estimated No. of trees per ha. for Previous  
and Current tree enumeration (2013-14)**

Sr. No	Name of Working Circle	Past enumeration	Sr. No.	Name of Working Circle	Current enumeration (2013-14) No. of trees per ha.
		No previous enumeration	1	Protection Working Circle	233.475
			2	Plantation Management Working Circle	184.905
			3	Improvement Working Circle	262.334
<b>Weighted Average</b>			<b>Weighted Average</b>		<b>232.287</b>

It is observed that the total estimated number of trees per hectare in current enumeration ( 2013-14) is 232.287

**Table 4 (b)**

**Estimated percentage of trees in 15 U 30 and 31 U 45 girth class.**

Working Circle	Girth class-wise estimated percentage of number of trees (%)			
	15U30	31U45	Remaining Girth Classes	Total estimated No. of trees
Protection Working Circle	30.390	28.441	41.169	100
Plantation Management Working Circle	29.802	32.689	37.509	100
Improvement Working Circle	24.921	28.158	46.921	100
<b>Weighted Average</b>	<b>29.122</b>	<b>29.028</b>	<b>41.850</b>	<b>100</b>

Working circle wise estimated, number of sound trees per hectare are as follows.

**Table No.5****Working Circlewise No. of sound trees per ha**

Sr. No.	Name of Working Circle	Total	General utility species	Special utility species	Minor forest produce species	Other species
1	2	3	4	5	6	7
1	Protection Working Circle	233.48	85.23	34.32	13.41	100.52
	% of stock to total stock	100	36.51	14.70	5.74	43.05
2	Plantation Management Working Circle	184.91	84.77	33.14	10.04	56.96
	% of stock to total stock	100	45.85	17.92	5.43	30.80
3	Improvement Working Circle	262.33	86.66	40.72	18.60	116.35
	% of stock to total stock	100	33.03	15.52	7.10	44.35
	Total weighted average	232.29	85.47	35.52	14.01	97.29
	% of stock to total stock	100	36.80	15.29	6.03	41.88

**Table No.5A****Working Circlewise Volume in cum. per ha**

Sr. No.	Name of Working Circle	Total	General utility species	Special utility species	Minor forest produce species	Other species
1	2	3	4	5	6	7
1	Protection Working Circle	43.405	11.377	5.425	4.518	22.085
	% of stock to total stock	100	26.210	12.500	10.410	50.880
2	Plantation Management Working Circle	30.018	9.832	5.709	2.965	11.512
	% of stock to total stock	100	32.750	19.020	9.880	38.350
3	Improvement Working Circle	58.271	14.606	8.615	6.850	28.200
	% of stock to total stock	100	25.070	14.780	11.760	48.390
Total weighted average		44.566	11.837	6.155	4.784	21.79

% of stock to total stock	100	26.56	13.81	10.74	48.89
---------------------------	-----	-------	-------	-------	-------

Highlights from the results of tree enumeration as given in table No.5, are summarised below:

**1) Protection Working Circle:-**

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Ain,Bibla, Bondara, Kakad, Teak, Tiwas	36.51
2	B:-Species of Special Utility	Dhawada,Haldu,Hed,Kalamb,Khair, Salai,Sawar, Semal, Shiwan	14.70
3	C:-Species of Minor Forest Produce	Amba,Apta,Awala, Behada, Biba, Bor,Char,Chinch,Hirda,Jambhul, Kaju,Moha,Nilgiri,Palas,Shiras , Tendu	5.74
4	D:-Other Species	Alu, Accacia, Dhaman, Asana, Gel,Kande,Kinjal,Kumbha,Mohat, Nana,Pangara,Umbar,Vehala etc..	43.05

**2) Plantation Management Working Circle:-**

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Ain, Bibla, Bondara, Kakad, Shisam, Teak.	45.85
2	B:-Species of Special Utility	Dhawada, Hed, Kalamb, Khair, Sawar, Shiwan	17.92
3	C:-Species of Minor Forest Produce.	Amba,Apta,Awala,Behada,Bor,Hirda, Jambhul,Kaju,Moha,Nilgiri,Palas, Shiras & Tendu	5.43
4	D:-Other Species	Asan,Dhaman,Ashid,Jambha,Kinjal, Mohat,Shemat	30.80

### 3) Improvement Working Circle:-

Catagorywise percentage of Species to total growing stock in this working circle is as given below

Sr. No.	Category of Species	Name of Species	% to total growing stock
1	A:- Species of General Utility	Ain,Bibla, Bondara,Teak,Tiwas	33.03
2	B:-Species of Special Utility	Dhawada, Hed, Kalamb,Khair, Sawar, Sem,al, Shiwan	15.52
3	C:-Species of Minor Forest Produce	Amba,Apta,Awala,Behada,Bor,Chinch, Hirda,Jambhul,Kaju,Moha,Nilgiri,Palas, Shiras,Tendu	7.10
4	D:-Other Species	Accacia,Alu,Asana,Dhaman,Kinjal,Moh at,Nana,Pangara,Shemat,Uambar,Vavala. etc.	44.35

**Table No.6**

#### **Availability of Teak in Previous Enumeration (No. of sound trees per ha.)**

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of trees to the total stock
1	2	3	4	5
1	No previous enumeration			

**Table No.6 (A)**

#### **Availability of Teak in Current (2013-14) enumeration. (No. of sound trees per ha.)**

Sr. No	Name Working Circle	Total growing Stock	Teak/Ha	% of stock of Teak trees to the total stock
1	2	3	4	5
1	Protection Working Circle	233.48	30.286	12.97
2	Plantation Management Working Circle	184.905	30.394	16.44
3	Improvement Working Circle	262.334	38.822	14.80
<b>Total (Weighted Average)</b>		<b>232.287</b>	<b>32.141</b>	<b>13.84</b>

**Estimated growing stock of Medicinal plant, Natural regeneration and grass per Ha.**

**Table No. 7**

**A) Medicinal plant, per ha (Sample plot size 5 Mtr.X 5 Mtr.)**

Sr. No.	Working Circle	Population area (Ha.)	No. of sample plots	Sample area (Ha.)	No.of Medicinal Plants in sample area	No. of Medicinal Plants per Ha.
1	2	3	4	5	6	7
1	Protection W.C.	30929.630	797	1.9925	1695	851
2	Plantation Management W.C.	7457.155	154	0.385	175	455
3	Improvement W . C.	10536.763	249	0.6225	435	699
	Total	48923.548	1200	3.000	2305	768

Working Circle wise name of species of **Medicinal Plants** found in sample plot are as follows.

Sr. No.	Working Circle	Name of species of Medicinal Plants
1	2	3
1	P.W.C.	Aadu,Aghada,Aamthi,Anantmul, Awala,Behada,Dhavati,Gaikand, garudwel,Ghaneri,Gulvel,Harad,Jambhul,Karanj,Kokam,Kunda, Moha,Narkya,Nirgudi, Nivdung,Murudsheng etc.
2	P.M. W.C.	Ambani,Anantmul,Bagulvel,Bibba,Dhayati,Garudvel, Gulvel, Jambhul,Murudsheng, etc.
3	I.W .C.	Aaghada,Aamruth, Bhuivel,Chandan, Dhayati, Garudvel, Jambhul, Karanj, Karvel, Murudsheng, etc.

**B) Natural Regeneration plant, per ha (Sample plot size 5 Mtr. X 5 Mtr.)**

Sr. No.	Working Circle	Population area (Ha.)	No. of sample plots	Sample area (Ha.)	No. of Regenerated Plants in sample area	No. of Regenerated Plants per Ha.
1	2	3	4	5	6	7
1	P.W.C.	30929.630	797	1.9925	2455	1232

2	P.M. W.C.	7457.155	154	0.3850	345	896
3	I. W .C.	10536.763	249	0.622	384	617
	Total	48923.548	1200	3.000	3184	1061

Working Circle wise name of species of **Natural regeneration** found in sample plot are as follows.

Sr. No.	Working Circle	Name of species of Natural Regeneration
1	2	3
1	P.W.C.	Amba, Apta, Asan , Ain ,Bahawa, Behada, Bija , Dhaman, Dhawada, Dhayati, Dinda, Jambha, Kakad, Karvand, Katekumbhal, Khair, Koshimb, Kuda, Lokhandi, Mohat, Nana, Palas,Sawar,Shiwan,Teak,Tendu, Umbar etc.
2	P.M. W.C.	Accacia, Aashi, Ain ,Behada, Dhaman, Dinda, Karvand, Karvi, Khair, Kinjal, Kuda, Kumbha, Mohat, Palas, Sawar, Shemat, Shivan,Umber etc.
3	I W .C.	Apta,Asana,Ashi,Ain,Bor,Chandan,Dhawada,Dinda,Gulmati, Hed, Harad, Jambhul, Karvand, Khair, Kuda, Lokhandi, Palas, Murudsheng, Sawar,Teak,Umber, Waras

### **C) Grass Species, per ha (Sample plot size 1 Mtr.X 1 Mtr.)**

Sr. No.	Working Circle	Population area (Ha.)	No. of sample plots	Sample area (Ha.)	No. of Grass roots in sample area	No. of Grass roots per Ha.
1	2	3	4	5	6	7
1	P.W.C.	30929.630	797	0.0797	1657	20790
2	P.M. W.C.	7457.155	154	0.0154	177	11494
3	I W .C.	10536.763	249	0.0249	793	31847
	Total	48923.548	1200	0.120	2627	21892

Working Circle wise name of species of **Grass Species** found in sample plot are as follows.

Sr. No.	Working Circle	Name of Grass Species
1	2	3
1	P.W.C.	Bhamrud,Dukkarkand,Ghagari, Kaleri, Kalki, Karvel,Kusali, kusha, Mhatari,Tela,Tirkat, Tudu etc.
2	P.M. W.C.	Bhamrud, Ghayati, Gondala, Karpel,Karvel, Koteri, Kusali,Mirkat,Tambeta etc.

3	I W .C.	Bargavat,Bhamrud,Chiknya, Dukkarkand, Fangada, Gonda, karvi,Kosha,Kusali,etc.
---	---------	---

**Statistical Analysis: -**

The Statistical personnel of the office of the Chief Forest Statistician, Maharashtra State, Nagpur has carried out the statistical analysis of the data, received from Dy. Conservator of Forests, Roha, the percentage standard error is calculated for each Working Circle is given in the following table No. 8

**Table No.8**  
**Working circlewise standard error**

Sr. No.	Name of working circle	Population area in ha	Sample area in ha	Intensity of sampling %	% Standard Error
1	Protection. W.C.	30929.630	286.920	0.93	3.7 %
2	Plantation Management W. C.	7457.155	55.440	0.74	6.61 %
3	Improvement W.C.	10536.763	89.640	0.85	4.99 %
	Total	48923.55	432.000	----	----

**Chief Forest Statistician,  
Maharashtra State, Nagpur.**



