SIMANFOR

Creating silvicultural scenarios

Aitor Vázquez Veloso

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Instituto Universitario de Investigación iuFOR GESTIÓN FORESTAL SOSTENIBLE

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In this document, we will NOT teach how to use the SIMANFOR website, but we will teach how to design your scenario within SIMANFOR.

To learn how to use the SIMANFOR website you can check the material available here.

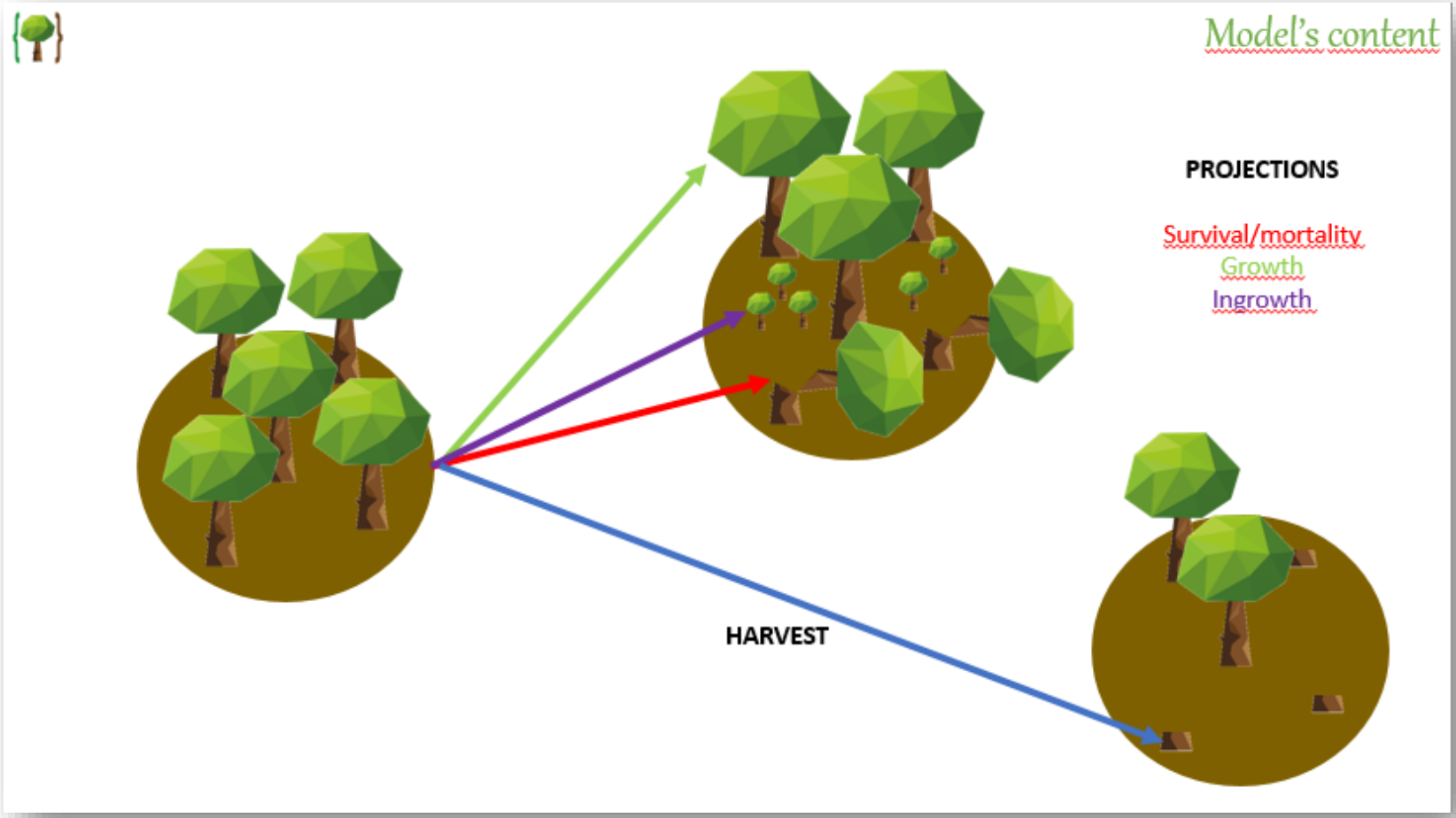
References

The silvicultural scenarios are all the treatments we want to apply to our stand during forest management. In Spain, it's common that public administration publishes some silvicultural reference manuals ("management recipes") to the most common species on their región, following different management objectives. Here you can check those of Asturias, Galicia, Cataluña and Castilla y León.

Another interesting piece of information is the bibliography like "Compendio de Selvicultura Aplicada en España", where you can find information about the silviculture of the forestry species like *Pinus pinaster* subsp. *mesogeensis* or *P. sylvestris*, among others.

Silvicultural scenarios on SIMANFOR – Part 1

In this document, we will not explain how the harvests and projections work. If you want to know more about that, here you can find it.
On the right, you have a summary just to refresh the information related to that topic.



Silvicultural scenarios on SIMANFOR – Part 1

The silvicultural scenario we will create in SIMANFOR is available at Del Río et al. (2006). It is focused on *Pinus pinaster* pure stands and at site quality 12 (page 38).
This is an example that can be applied to the sample inventory data, extracted from this document following the procedure explained here.

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
- 40 años: 1ª clara semisistemática con clara baja entre calles. Cuando no se haya realizado clareo, poda baja en todos los pies.
- 50 años: 2ª clara por lo bajo.
- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
40	10,4	1.500	13,4	21,1	92,8	575	12,1	29,4	925	14,2	14,6	63,4
50	12,0	925	19,2	26,9	135,7	375	16,7	42,4	550	20,8	18,6	93,2
65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

Let's get down the business!

First of all, let's identify how many silvicultural activities we need to carry out. If we analyze the information, we can count a total of 5 activities, although maybe not all of them need to be applied.

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

1. ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
2. 40 años: 1ª clara semisistemática con clara baja entre calles. Cuando no se haya realizado clareo, poda baja en todos los pies.
3. 50 años: 2ª clara por lo bajo.
4. 65 años: 3ª clara por lo bajo.
5. Turno: 80 años.

			Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
	Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
2	40	10,4	1.500	13,4	21,1	92,8	575	12,1	29,4	925	14,2	14,6	63,4
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4	65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
5	80	14,6	400	32,5	33,1	201,8							

1. Precommercial thinning

For stands larger than 1.500 trees/ha it is recommended to apply precommercial thinning. As our initial density is 1.485 trees/ha, that activity is not needed.

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

1

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
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- 50 años: 2ª clara por lo bajo.
- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
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50	12,0	925	19,2	26,9	135,7	375	16,7	42,4	550	20,8	18,6	93,2
65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

2. Thinning

Following the guide, we establish that:

- **Application age**: 40 years
- **Harvest type**: semi-systematic. Since there are no semi-systematic harvest operations, we shall carry out that harvest type by applying two consecutive harvest operations, the first one systematic and the second one by below
- **Harvest criteria and intensity**: this value is extracted from the table, let's see how to calculate it…

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
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- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
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65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

2. Thinning

Harvest criteria and intensity:

The harvest criteria are chosen according to the available information in the table. In that case, we know N (density), G (basal area) and V (volume), so we can use any possible criteria. On the other hand, the harvest intensity is estimated by calculating the percentage (%) of the stand extracted for the selected criteria. Let's look at an example:

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
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- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

	Masa principal antes de la clara					Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
40	10,4	1.500	13,4	21,1	92,8	575	12,1	29,4	925	14,2	14,6	63,4
50	12,0	925	19,2	26,9	135,7	375	16,7	42,4	550	20,8	18,6	93,2
65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

2. Thinning

Harvest criteria and intensity:

Assuming that the chosen harvest criterio are N (density). The intensity is the extracted percentage of N, so it could be calculated in several ways:

- Using the information on "masa extraída" *(extracted trees)* and "masa antes de la clara" *(stand before thinning)*, it would be enough to calculate:

$$(575/1.500)\cdot 100 = 38,3\%$$

- Another possibility is to use the information from the "masa principal antes / después de la clara" *(stand before/after thinning)*, where the extracted percentage is the difference between the total (100%) and the part of the stand that remains on the field (ratio):

$$(100 - (925/1.500))\cdot 100 = 38,3\%$$

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
- 40 años: 1ª clara semisistemática con clara baja entre calles. Cuando no se haya realizado clareo, poda baja en todos los pies.
- 50 años: 2ª clara por lo bajo.
- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
40	10,4	1.500	13,4	21,1	92,8	575	12,1	29,4	925	14,2	14,6	63,4
50	12,0	925	19,2	26,9	135,7	375	16,7	42,4	550	20,8	18,6	93,2
65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

2. Thinning

Harvest criteria and intensity:

- Occasionally you may come across cases where the tables are more concise, however, as these tables do not usually take into account trees that die and are incorporated into the stand, harvest intensity can be estimated as the lost density between two stand statuses:

(100 – (925/1.500))·100 = 38,3%

*Note: this can be done using N because it does not take into account dead and incorporated trees; this calculation cannot be replicated with G and V, as they are variables that increase in value with the growth of the trees

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
- 40 años: 1ª clara semisistemática con clara baja entre calles. Cuando no se haya realizado clareo, poda baja en todos los pies.
- 50 años: 2ª clara por lo bajo.
- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
40	10,4	1.500	13,4	21,1	92,8	575	12,1	29,4	925	14,2	14,6	63,4
50	12,0	925	19,2	26,9	135,7	375	16,7	42,4	550	20,8	18,6	93,2
65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

2. Thinning

All right, that's it. As SIMANFOR isn't able to apply semi-systematic harvests, the only thing left is to divide the process into two steps. The first activity would look like this:

- **Application age**: 40 years
- **Harvest type**: systematic
- **Harvest criteria and intensity:**

38,3/2 = 19,1% de N

We're almost there, but for this case, it's not going to be so easy…

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
- 40 años: 1ª clara semisistemática con clara baja entre calles. Cuando no se haya realizado clareo, poda baja en todos los pies.
- 50 años: 2ª clara por lo bajo.
- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
40	10,4	1.500	13,4	21,1	92,8	575	12,1	29,4	925	14,2	14,6	63,4
50	12,0	925	19,2	26,9	135,7	375	16,7	42,4	550	20,8	18,6	93,2
65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

2. Thinning

On the semi-systematic harvest, we would extract 38,3% of the trees in the stand, i.e., 575 trees. By dividing that process into two steps, we are extracting 575/2 = 287,5 tres per step (of course in the real world is not possible to extract half a tree but remember that this is a simulation…). Therefore, the second intervention would look like this:

- **Application age:** 40 years
- **Harvest type**: by below
- **Harvest criteria and intensity:**

(287,5/(1500-287,5))·100 =
(287,5/1212,5)·100 =
23,7% de N

That was a bit difficult, but if you think about it, it makes sense…

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
- 40 años: 1ª clara semisistemática con clara baja entre calles. Cuando no se haya realizado clareo, poda baja en todos los pies.
- 50 años: 2ª clara por lo bajo.
- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
40	10,4	1.500	13,4	21,1	92,8	575	12,1	29,4	925	14,2	14,6	63,4
50	12,0	925	19,2	26,9	135,7	375	16,7	42,4	550	20,8	18,6	93,2
65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

3. Thinning

- **Application age**: 50 years
- **Harvest type**: by below
- **Harvest criteria and intensity**: we have already seen how it is calculated in the previous case… for this case, the thinning can be applied following different combinations (the result Will be the same):
  - 40,5% of N
  - 30,8% of G
  - 31,2% of V

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
- 40 años: 1ª clara semisistemática con clara baja entre calles. Cuando no se haya realizado clareo, poda baja en todos los pies.

3

- 50 años: 2ª clara por lo bajo.
- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
40	10,4	1.500	13,4	21,1	92,8	575	12,1	29,4	925	14,2	14,6	63,4
3 50	12,0	925	19,2	26,9	135,7	375	16,7	42,4	550	20,8	18,6	93,2
65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

4. Thinning

- **Application age**: 65 years
- **Harvest type**: by below
- **Harvest criteria and intensity:**
  - 27,3% of N
  - 22,1% of G
  - 22,5% of V

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
- 40 años: 1ª clara semisistemática con clara baja entre calles. Cuando no se haya realizado clareo, poda baja en todos los pies.
- 50 años: 2ª clara por lo bajo.
- 65 años: 3ª clara por lo bajo.
- Turno: 80 años.

4

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
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80	14,6	400	32,5	33,1	201,8							

5. Rotation

The silvicultural rotation is the final harvest, which is applied to the whole amount of tres remaining on the field.
After this, the table would not provide us with information about the status of the stand after thinning (every variable would be 0) nor about the extracted stand (it would be the same as the status of the stand before thinning).

Knowing that it is not necessary to apply it, assuming that the information of the extracted timber at the final thinning is the one marked in red.

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

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5

		Masa principal antes de la clara				Masa extraída			Masa principal después de la clara			
Edad años	Ho m	N pies/ha	Dg cm	G m^2/ha	V m^3/ha	N pies/ha	Dg cm	V m^3/ha	N pies/ha	Dg cm	G m^2/ha	V m^3/ha
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65	13,6	550	26,9	31,2	178,0	150	24,2	40,1	400	27,8	24,3	137,9
80	14,6	400	32,5	33,1	201,8							

5

Summary

Harvest	Age (years)	Type	Criteria	Intensity (%)
Prec. Thinning	20	Not applied to our stand		
Thinning	40	Systematic	N	19,1
Thinning	40	By below	N	23,7
Thinning	50	By below	N	40,5
Thinning	65	By below	N	27,3
Rotation	80	Not neccesary		

CALIDAD DE ESTACIÓN 12

Esquema selvícola:

- ≈20 años: cuando la densidad inicial sea superior a 1.500 pies/ha, clareo acompañado de podas bajas en todos los pies.
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80	14,6	400	32,5	33,1	201,8							

Well, this is the information that we will have to include on SIMANFOR in order to create our scenario. It may be tedious the first time, but later you will see that it is simpler than it seems.

Now, let's créate this scenario in SIMANFOR.

Summary

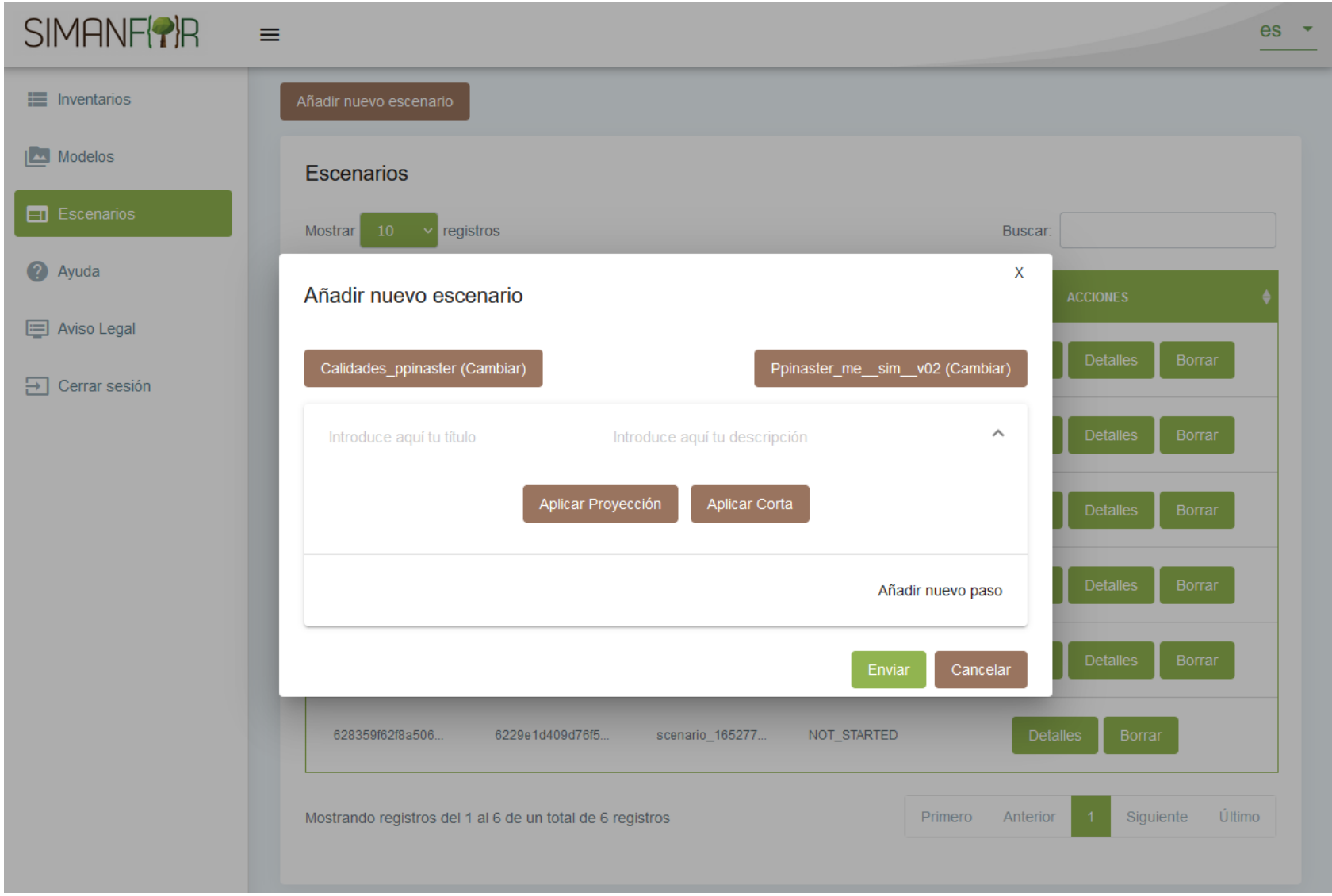
Harvest	Age (years)	Type	Criteria	Intensity (%)
Prec. Thinning	20	Not applied to our stand		
Thinning	40	Systematic	N	19,1
Thinning	40	By below	N	23,7
Thinning	50	By below	N	40,5
Thinning	65	By below	N	27,3
Rotation	80	Not neccesary		

Silvicultural scenarios on SIMANFOR – Part 1

We will use site quality data for *Pinus pinaster* obtained from Del Río et al. (2006) and the model for the same species, whose data sheet can be checked here.

This is the preview of the website after selecting the inventory and model.

Note: remember that here we explain how to create a scenario in SIMANFOR.

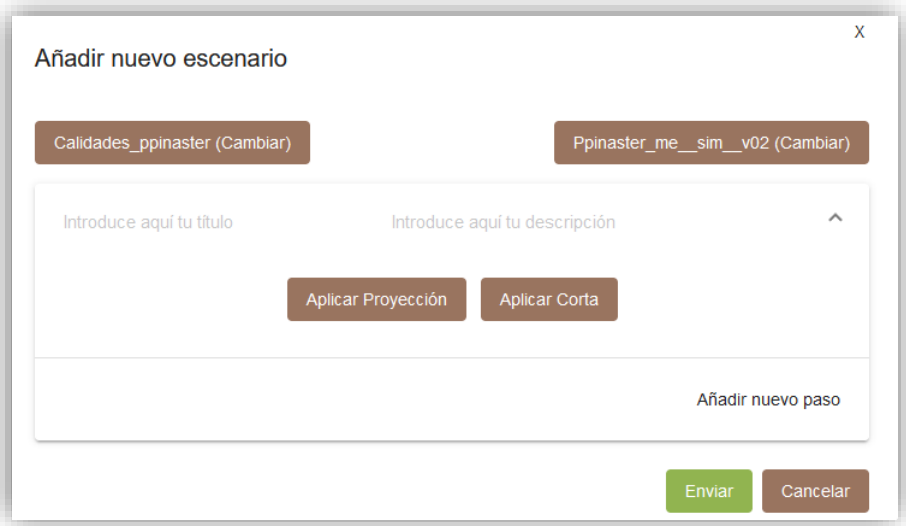


Silvicultural scenarios on SIMANFOR – Part 1

To refresh our memory, the initial age of our plot is 20 years. At the same age, thinning should be applied, but we have seen that it is not necessary in our study case.
Taking that into account, the next activity is at 40 years, so we must project 20 years of growth. To do this, each model has a default value for growth (look for it in the ints data sheet), which in SIMANFOR we call "projection time". In our study case, the projection time is 5 years.

Knowing this, let's Schedule 4 projections of 5 years for our stand to reach the age of 40 years.

Harvest	Age (years)	Type	Criteria	Intensity (%)
Prec. Thinning	20	Not applied to our stand		
Thinning	40	Systematic	N	19,1
Thinning	40	By below	N	23,7
Thinning	50	By below	N	40,5
Thinning	65	By below	N	27,3
Rotation	80	Not neccesary		

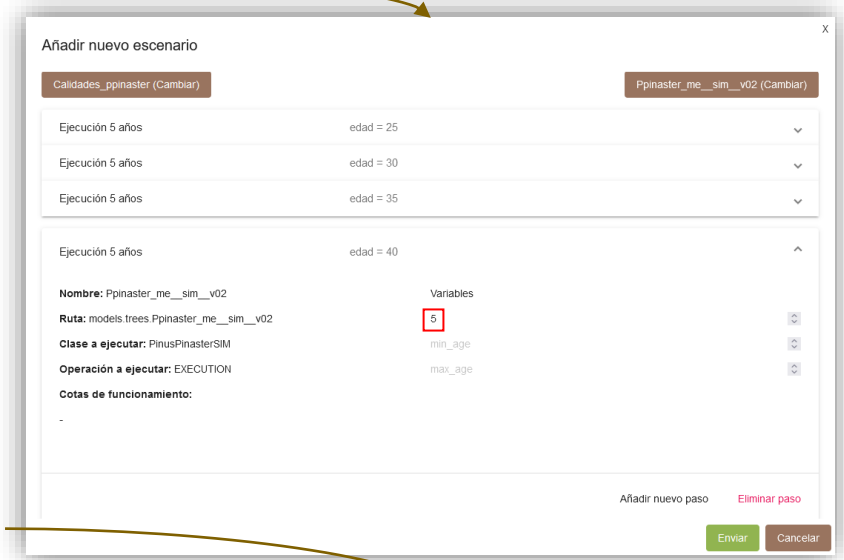


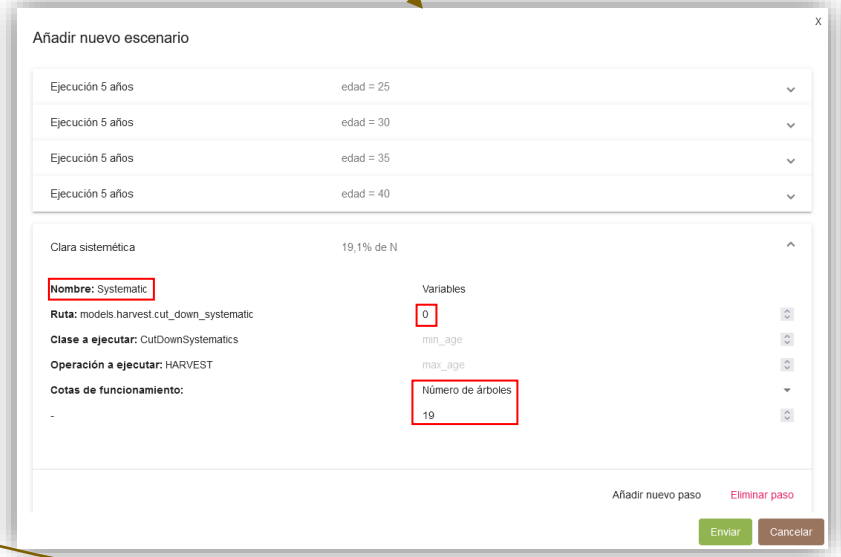
Silvicultural scenarios on SIMANFOR – Part 1

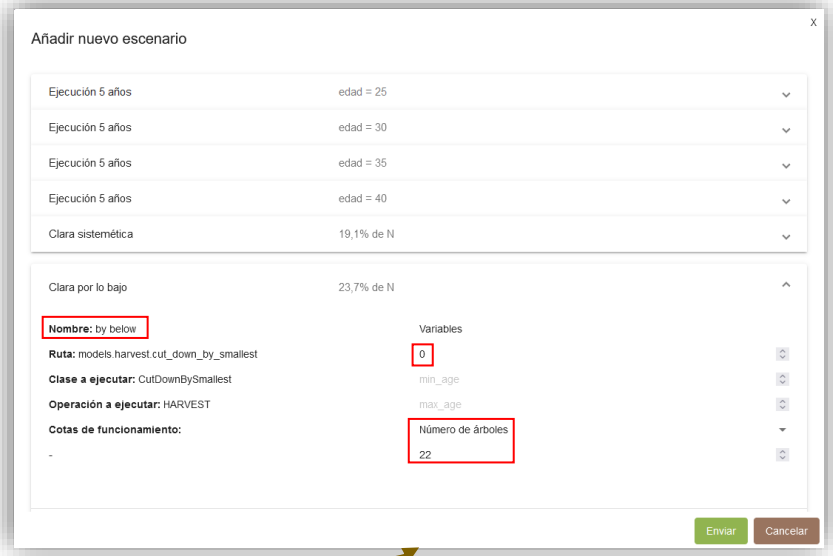
To do that we apply 4 projections with "time" (projection time) = 5 years. Now, our plot is 40 years old and it is time to apply a silvicultural activity.

When adding a new step we select "Apply harvest", and we will first select "Systematic" harvest type, setting run time 0, harvest criteria "Number of trees", and intensity 19% (no decimal allowed).

Next, we add a new step where we Will apply a harvest by below, removing 24% of the trees.







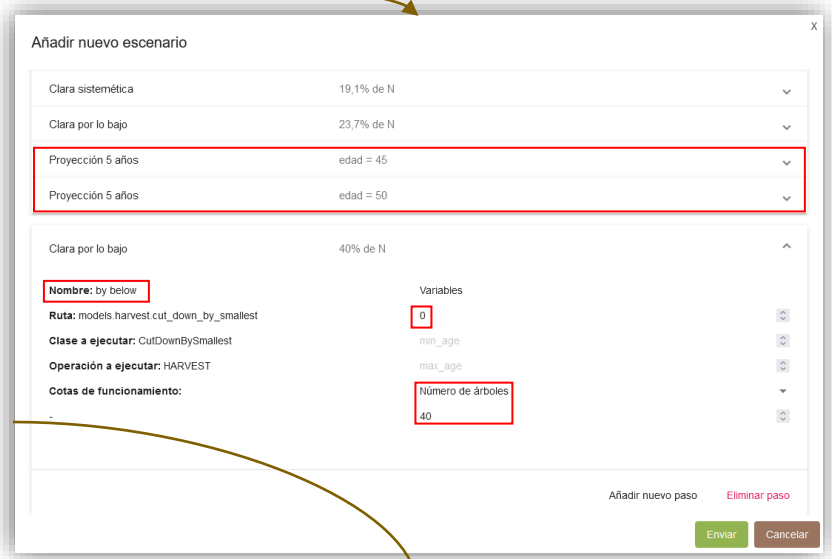
Harvest	Age (years)	Type	Criteria	Intensity (%)
Prec. Thinning	20	Not applied to our stand		
Thinning	40	Systematic	N	19,1
Thinning	40	By below	N	23,7
Thinning	50	By below	N	40,5
Thinning	65	By below	N	27,3
Rotation	80	Not neccesary		

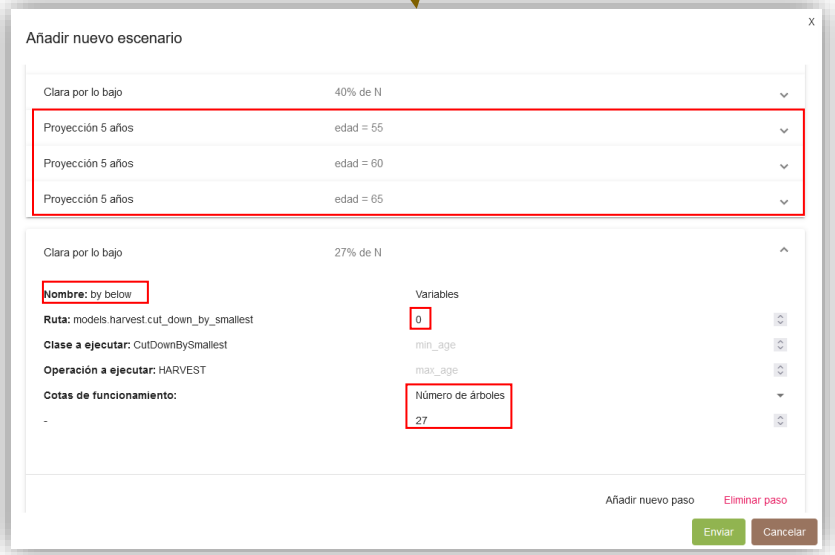
Silvicultural scenarios on SIMANFOR – Part 1

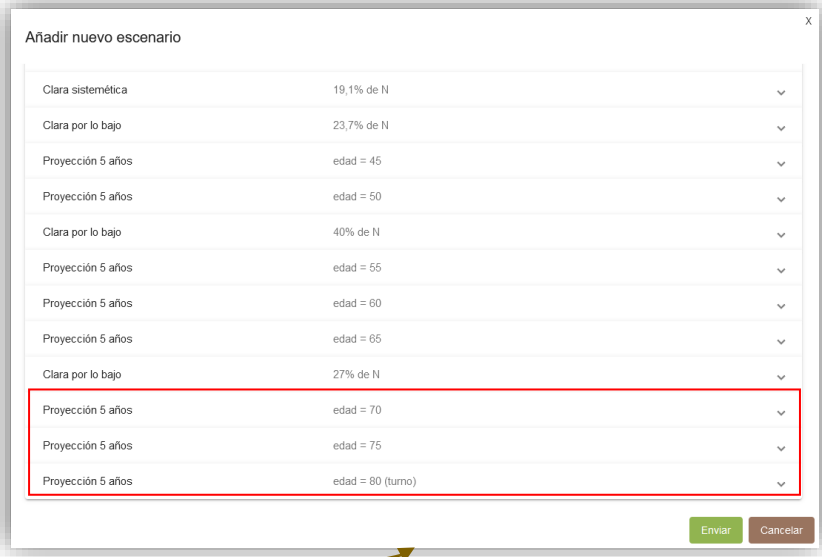
The next activity is at 50 years of age, so we will need to make two 5-year projections and then apply a harvest by below 40% of N.

Then we will have the next activity at age 65, which will be a thinning by below 27% of N, so we need to apply before that 3 5-year projections.

Finally, we have a rotation age of 80 years age. As we said, it is not necessary (nor recommended) to apply a harvest to extract 100% of the tres, so it Will only be necessary to make 3 5-year projections to reach the rotation age.







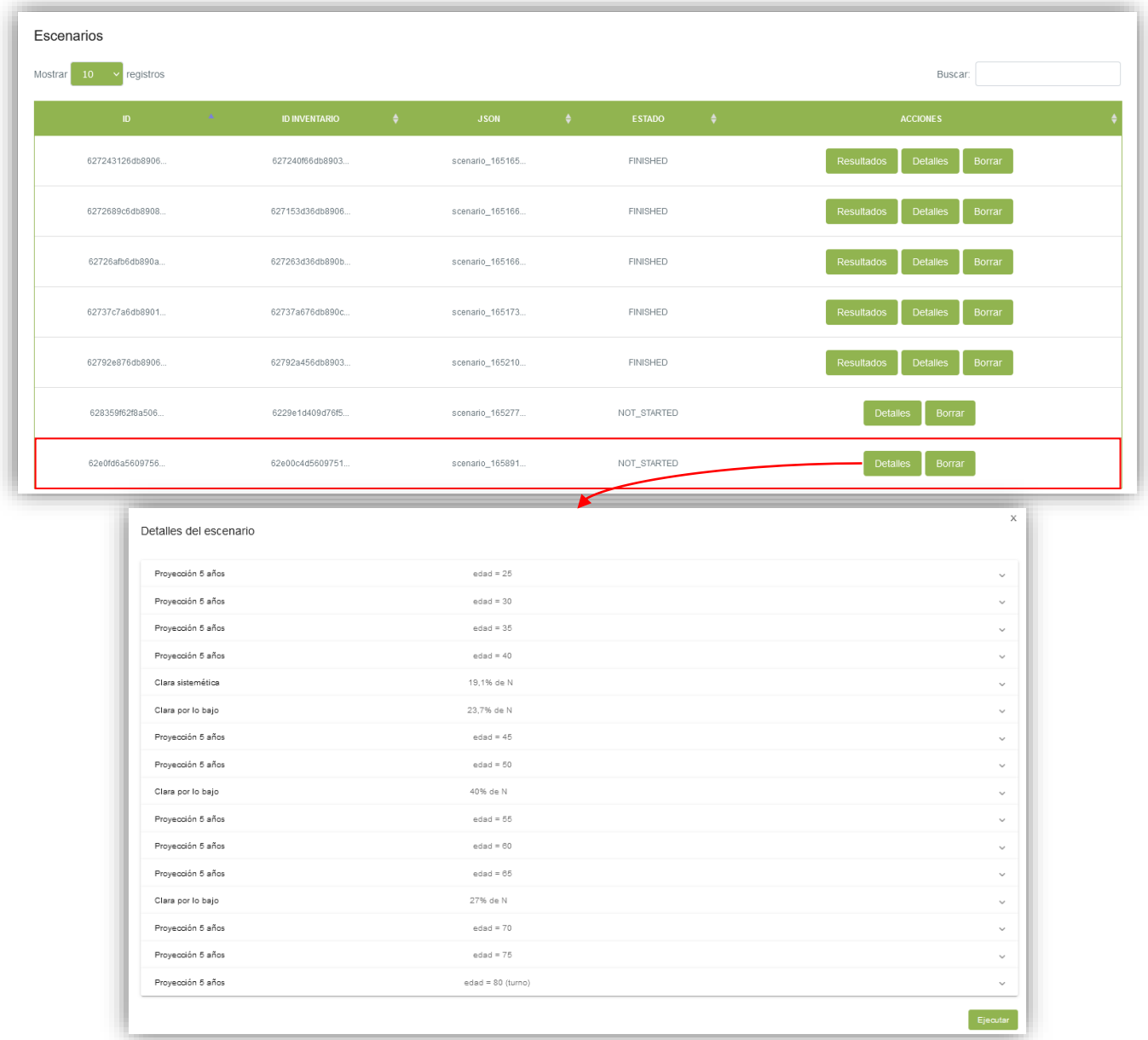
Harvest	Age (years)	Type	Criteria	Intensity (%)
Prec. Thinning	20	Not applied to our stand		
Thinning	40	Systematic	N	19,1
Thinning	40	By below	N	23,7
Thinning	50	By below	N	40,5
Thinning	65	By below	N	27,3
Rotation	80	Not neccesary		

Silvicultural scenarios on SIMANFOR – Part 1

Done!

We can click on the “details” tab to check that we have not skipped any step and run the scenario. If you want to know how to interpret the results, we explain it here.

Note: if you don’t get any result, run it again, sometimes the connection fails… computer stuff…

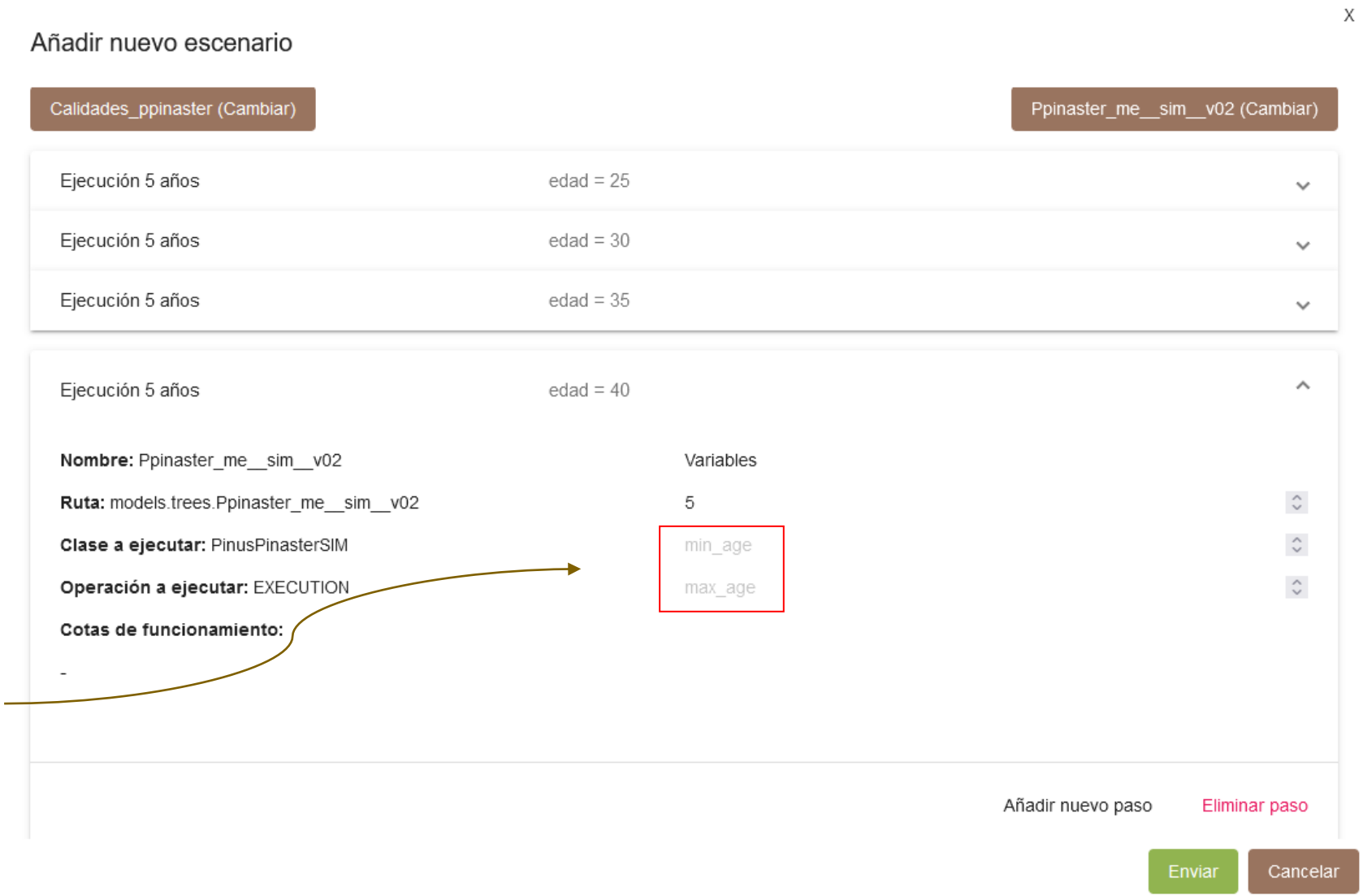


Silvicultural scenarios on SIMANFOR – Part 2

Silvicultural scenarios on SIMANFOR – Part 2

In the previous section, we have seen how to set up a silvicultural scenario in SIMANFOR for a single plot or many plots with the same age, but… have you ever thought about what happens if we try to simulate plots with different ages? We would have to create a scenario for each one of them taking into account their starting age so that each activity would be applied at the same age for each case, and this would be very tedious…

To make it easier, some variables determine the máximum and mínimum age that a plot must have for the projection or harvest to be applied, let's see how they work.



Silvicultural scenarios on SIMANFOR – Part 2

We Will use as an example the same silvicultural scenario as in the previous section, and as input data we will use 4 plots with different ages (20, 32, 41 and 47 years old).

As you can already guess, if we want to apply the first harvest at 40 years, the projections we have to apply will be different for each case, and we should even not apply the 40-year thinning to the last plots…
It looks like it's getting complicated, let's see how to manage it.

Harvest	Age (years)	Type	Criteria	Intensity (%)
Prec. Thinning	20	Not applied to our stand		
Thinning	40	Systematic	N	19,1
Thinning	40	By below	N	23,7
Thinning	50	By below	N	40,5
Thinning	65	By below	N	27,3
Rotation	80	Not neccesary		

Silvicultural scenarios on SIMANFOR – Part 2

To understand where each plot has to start running, we will expand our summary table by introducing the projections.

Process	Age (years)	Type	Criteria	Intensity (%)
Prec. Thinning	20		Not applied	
Projection	20 to 25		5 years	
Projection	25 to 30		5 years	
Projection	30 to 35		5 years	
Projection	35 to 40		5 years	
Thinning	40	Systematic	N	19,1
Thinning	40	By below	N	23,7
Projection	40 to 45		5 years	
Projection	45 to 50		5 years	
Thinning	50	By below	N	40,5
Projection	50 to 55		5 years	
Projection	55 to 60		5 years	
Projection	60 to 65		5 years	
Thinning	65	By below	N	27,3
Projection	65 to 70		5 years	
Projection	70 to 75		5 years	
Projection	75 to 80		5 years	
Rotation	80		Not neccesary	

Silvicultural scenarios on SIMANFOR – Part 2

Now, let's mark the part of the scenario where each of the plots should start the simulation.

Note: you may have noticed that when the age is not a multiple of 5 there is a mismatch. We Will place the plots on the stage with a margin of 3 years (above and below) the stage age, assuming those 3 years as an "error" (it is not a big deal, this can be a problem in fast-growing species, but their growth sub-models are usually designed for shorter projection times).

Plots
20
32
41
47

Process	Age (years)	Type	Criteria	Intensity (%)
Prec. Thinning	20		Not applied	
Projection	20 to 25		5 years	
Projection	25 to 30		5 years	
Projection	30 to 35		5 years	
Projection	35 to 40		5 years	
Thinning	40	Systematic	N	19,1
Thinning	40	By below	N	23,7
Projection	40 to 45		5 years	
Projection	45 to 50		5 years	
Thinning	50	By below	N	40,5
Projection	50 to 55		5 years	
Projection	55 to 60		5 years	
Projection	60 to 65		5 years	
Thinning	65	By below	N	27,3
Projection	65 to 70		5 years	
Projection	70 to 75		5 years	
Projection	75 to 80		5 years	
Rotation	80		Not neccesary	

Silvicultural scenarios on SIMANFOR – Part 2

More…

What we want to do in this section is to apply the same silvicultural scenario for plots in different initial ages. We already know where each one has to start running, how do we tell SIMANFOR? We will use the mínimum and máximum age variables, but first, we are going to put the reference age at which each intervention begins and ends as a guide.

Process	Age (years)	Type	Criteria	Intensity (%)	Standard initial plot age (years)	Minimum age (years)	Maximum age (years)	Standard final plot age (years)
20 Prec. Thinning	20		Not applied		20			20
Projection	20 to 25		5 years		20			25
Projection	25 to 30		5 years		25			30
32 Projection	30 to 35		5 years		30			35
Projection	35 to 40		5 years		35			40
41 Thinning	40	Systematic	N	19,1	40			40
Thinning	40	By below	N	23,7	40			40
Projection	40 to 45		5 years		40			45
47 Projection	45 to 50		5 years		45			50
Thinning	50	By below	N	40,5	50			50
Projection	50 to 55		5 years		50			55
Projection	55 to 60		5 years		55			60
Projection	60 to 65		5 years		60			65
Thinning	65	By below	N	27,3	65			65
Projection	65 to 70		5 years		65			70
Projection	70 to 75		5 years		70			75
Projection	75 to 80		5 years		75			80
Rotation	80		Not neccesary		80			-

Silvicultural scenarios on SIMANFOR – Part 2

For the first activity at 20 years, the minimum age will be the age value from which thinning will be applied on the plot. Similarly, the máximum age will be the age value from which thinning will NOT be applied (that step will be skipped). For this purpose, we are going to rescue the "error" value of 3 years we introduce before, establishing the minimum age for thinning as 17 years and the maximum age as 23 years.

Process	Age (years)	Type	Criteria	Intensity (%)	Standard initial plot age (years)	Minimum age (years)	Maximum age (years)	Standard final plot age (years)
20 Prec. Thinning	20		Not applied		20	17	23	20
Projection	20 to 25		5 years		20			25
Projection	25 to 30		5 years		25			30
32 Projection	30 to 35		5 years		30			35
Projection	35 to 40		5 years		35			40
41 Thinning	40	Systematic	N	19,1	40			40
Thinning	40	By below	N	23,7	40			40
Projection	40 to 45		5 years		40			45
47 Projection	45 to 50		5 years		45			50
Thinning	50	By below	N	40,5	50			50
Projection	50 to 55		5 years		50			55
Projection	55 to 60		5 years		55			60
Projection	60 to 65		5 years		60			65
Thinning	65	By below	N	27,3	65			65
Projection	65 to 70		5 years		65			70
Projection	70 to 75		5 years		70			75
Projection	75 to 80		5 years		75			80
Rotation	80		Not neccesary		80			-

Silvicultural scenarios on SIMANFOR – Part 2

Following the same criteria, we are going to apply them to all the processes we have in our scenario.

Note: Please note that thinning processes do not advance in time, so the minimum and maximum ages are maintained in the next process.

Process	Age (years)	Type	Criteria	Intensity (%)	Standard initial plot age (years)	Minimum age (years)	Maximum age (years)	Standard final plot age (years)
20 Prec. Thinning	20		Not applied		20	17	23	20
Projection	20 to 25		5 years		20	17	23	25
Projection	25 to 30		5 years		25	22	27	30
32 Projection	30 to 35		5 years		30	27	32	35
Projection	35 to 40		5 years		35	32	37	40
41 Thinning	40	Systematic	N	19,1	40	37	42	40
Thinning	40	By below	N	23,7	40	37	42	40
Projection	40 to 45		5 years		40	37	42	45
47 Projection	45 to 50		5 years		45	42	47	50
Thinning	50	By below	N	40,5	50	47	52	50
Projection	50 to 55		5 years		50	47	52	55
Projection	55 to 60		5 years		55	52	57	60
Projection	60 to 65		5 years		60	57	62	65
Thinning	65	By below	N	27,3	65	62	67	65
Projection	65 to 70		5 years		65	62	67	70
Projection	70 to 75		5 years		70	67	72	75
Projection	75 to 80		5 years		75	72	77	80
Rotation	80		Not neccesary		80	-	-	-

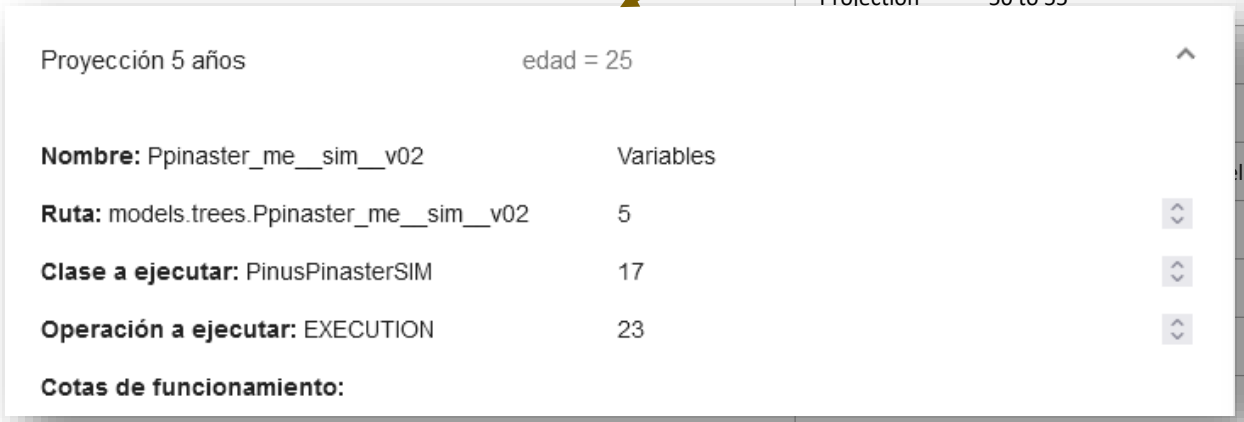
Silvicultural scenarios on SIMANFOR – Part 2

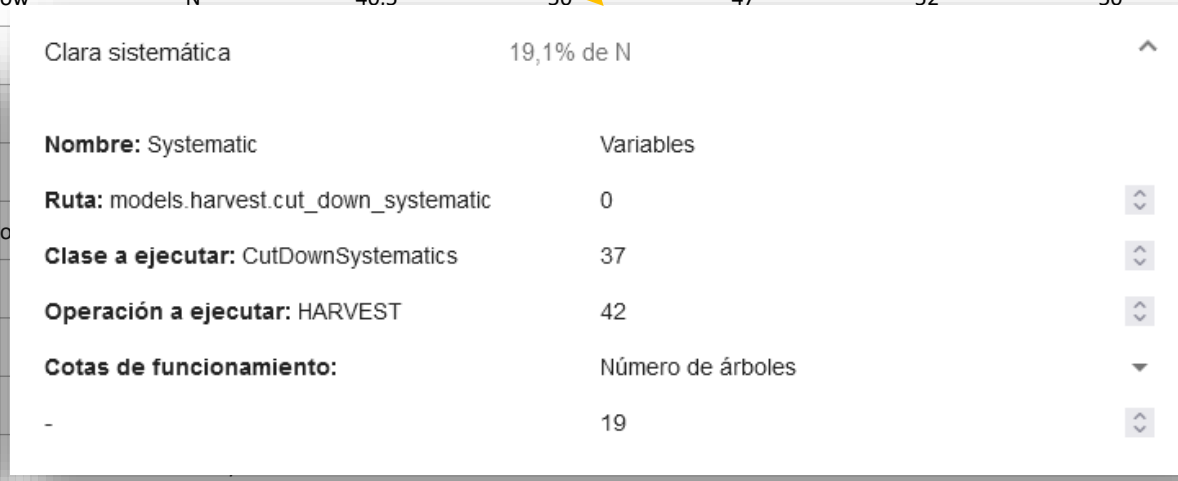
We've got it!

We only need to write the scenario in SIMANFOR, and in this way, we will be able to use the same scenario for an inventory with plots of different ages.

I recommend that you first make a table like the one we have prepared here to avoid mistakes, as this can sometimes lead to confusión.

Corta	Edad (años)	Tipo	Criterio	Intensidad (%)	Edad estándar inicial de la parcela (años)	Edad minima (años)	Edad máxima (años)	Edad estándar final de la parcela (años)
Prec. Thinning	20		Not applied		20	17	23	20
Projection	20 to 25		5 years		20	17	23	25
Projection	25 to 30		5 years		25	22	27	30
Projection	30 to 35		5 years		30	27	32	35
Projection	35 to 40		5 years		35	32	37	40
Thinning	40	Systematic	N	19,1	40	37	42	40
Thinning	40	By below	N	23,7	40	37	42	40
Projection	40 to 45		5 years		40	37	42	45
Projection	45 to 50		5 years		45	42	47	50
Thinning	50	By below	N	40.5	50	47	52	50
Projection	50 to 55							

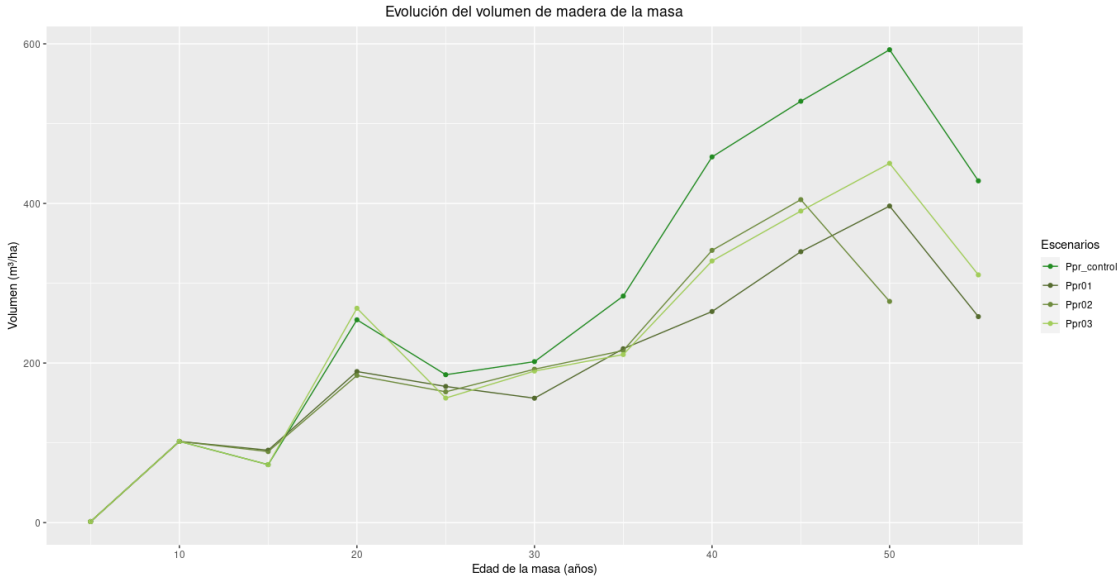


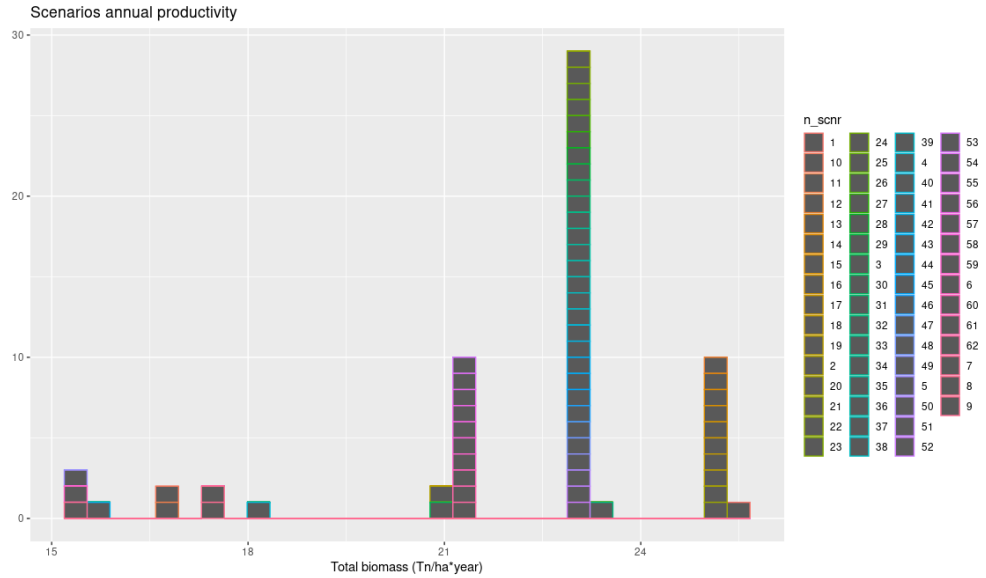


Scenarios comparison

Scenarios comparison

Finally, once we have applied the same scenario to several plots or different scenarios on the same plot, it is interesting to draw our results and compare them. In this repository, you have a R script that allows you to load the SIMANFOR results and compare them graphically. Go ahead and try it! I'm sure you will discover interesting things from your results.





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