Ministry for Primary Industries
Manatū Ahu Matua

Te Uru Rākau New Zealand Forest Service

A guide to mapping forest land in the ETS

Where to draw polygon boundaries when mapping post-1989 forest land

Last updated: 31 March 2026

Contents

Follow the rules when mapping forest land for the ETS

When you map an area of post-1989 forest land to include in an application for the ETS (to join or to add more land), it must be mapped in a certain way. This ensures:

- everyone involved in the ETS maps their forest the same way
- calculations for emissions returns will be prepared consistently by everyone, as these are based on the area of land in the ETS
- the maps are a reliable record of forestry activities in the ETS.

Where to find the rules for mapping forest for the ETS

The rules for mapping land in the ETS are published in the Geospatial Mapping Information Standard. MPI created this standard under authority from the Climate Change Response Act 2002.

Download the Geospatial Mapping Information Standard [PDF, 530 KB]

The guidance below explains the rules in sections 1.5 and 1.6 of this Standard. It shows how to apply these rules when digitising the edges of post-1989 forest land, in this case while using aerial orthophotos.

This guidance is intended for people already familiar with digital mapping terminology and with using geographic information systems (GIS). If you aren't experienced in GIS, we recommend hiring a forestry consultant or GIS consultant to help you.

We'll refer to polygons and shapefiles in this guide, as this is the required digital format for supplying the data.

See our web pages about mapping forest land for the ETS

This guide is designed to be used alongside these pages on the MPI website:

- How to map forestry for the ETS
- Making sure mapped land is eligible for the ETS
- Choosing and mapping carbon accounting areas

What you can and cannot include within the shapefile polygons

To register land in the ETS, it must be:

- considered to be eligible as post-1989 forest land
- be land that the applicant has a legal entitlement to, as a land owner, or registered forestry right or leaseholder of a registered lease, or Crown conservation contract holder.

When you create the polygons for a shapefile accompanying an application to register in the ETS, you:

- must include complete, continuous areas of eligible post-1989 forest land (see more about mapping this below)
- can include certain smaller areas, in line with the rules in the Geospatial Information Mapping Standard
- must exclude areas that are not considered post-1989 forest land.

We may also remove areas when we process the application, if we see any areas that cannot be confirmed as eligible to enter the ETS.

Read about the rules for post-1989 forest eligibility – MPI website

The size and density requirements for forest land in the ETS – MPI website

Making sure mapped land is eligible – MPI website

Where to draw the polygon

When you map the areas of post-1989 forest land, you'll follow the outer edge of the crown of the trees at the edges of the forest.

If you're mapping saplings, you'll draw the polygon where the crown cover is expected to reach when the forest is:

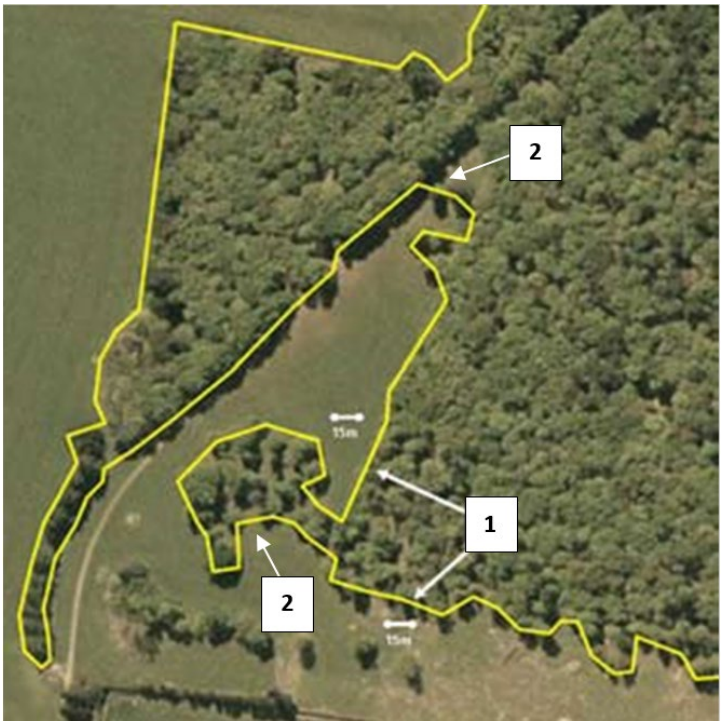
- the age it's expected to be harvested for the tree species, or
- when it reaches maturity.

Where to draw the crown edge if you are mapping saplings – MPI website

You don't need to draw the exact crown edge and curvature of every tree (figure 1). Aim for a close approximation of the boundary, making sure the polygon drawn touches the tree crown edges of the land being mapped at least every 15 metres (the "15-m rule").

The 15-m rule means you can simplify the polygon where the edge of the forest is relatively linear, and include more detailed mapping where the edge of the forest is more complicated (figure 1). It also means you can include small gaps in the crown cover and avoid spending time mapping them out.

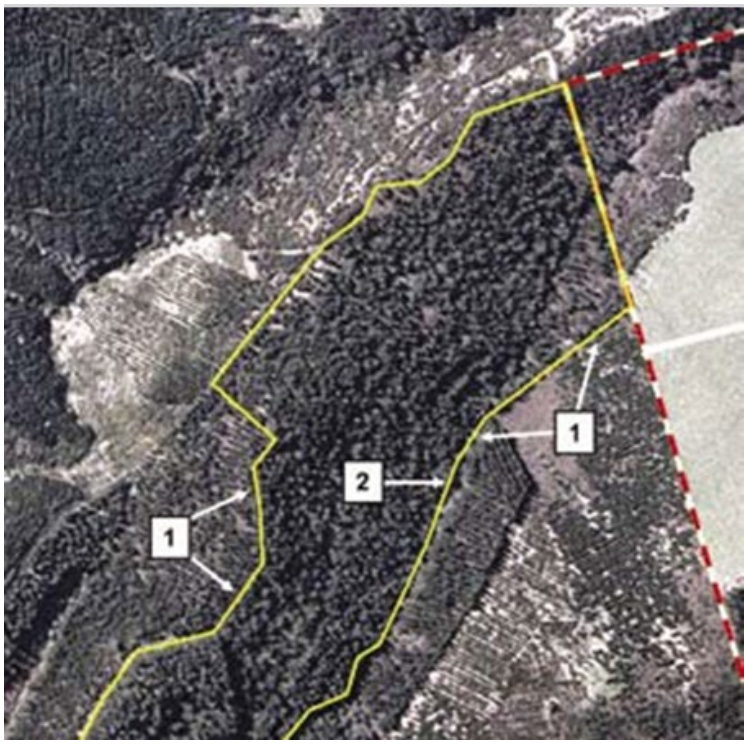
Figure 1. The yellow line shows part of a polygon drawn along the edge of the forest within 15 m of the outer crown edge. (1) Following this "15-m rule" means you don't need to follow the exact edges of the tree crowns. Ensure that shadows at the edge of the forest are not included as part of the crown cover. (2) The "15-m rule" also allows you to draw the polygon across small gaps in crown cover at the forest edge.



Sometimes post-1989 forest land will be adjacent to other forest that cannot enter the ETS. Figure 2 shows post-1989 forest land that is next to pre-1990 forest land. You should not include adjacent ineligible forest in the polygons in the shapefile.

- If post-1989 forest land is immediately adjacent to forest that is ineligible to enter the ETS, you'll draw the boundary to pass equally between the two (possibly overlapping) tree crown edges.
- If there is a gap between the post-1989 forest land and the ineligible forest, for example if there is a road, the polygon must follow the crown edge of the post-1989 forest land.

Figure 2 This area of post-1989 forest land is adjacent to pre-1990 forest land, which cannot be included in the application. (1) The yellow line shows the correct placement of the polygon covering the area of post-1989 forest land, between the crown edges of the two different sorts of forest. (2) Where there are visible gaps between the two areas of forest, follow the tree crown edge of the post-1989 forest land.



Mapping at the edge of property boundaries

You can only include land in the polygons that the applicant has a legal entitlement to include as:

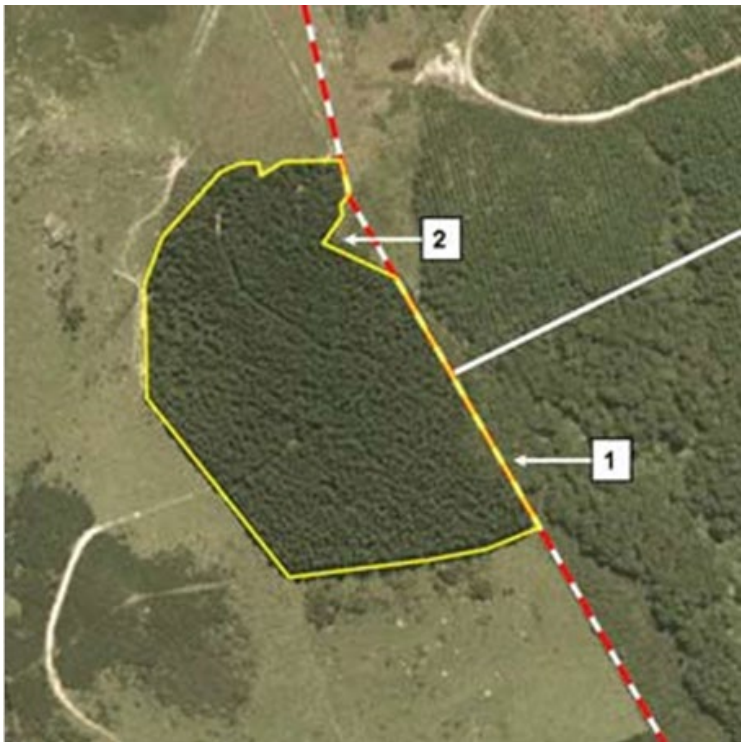
- the land owner
- someone who holds forestry right registered on the land title
- leaseholder of a lease registered on the land title
- a Crown Conservation Contract holder.

In figure 3, the adjacent land belongs to someone else. The polygon can only include the eligible forest up to the land title boundary. The edge of the polygon must either follow:

- the land title boundary where the forested area overlaps it, and
- the tree crown edge when it moves away from the boundary.

You can map forest land across multiple land titles if the applicant has the legal right to register the forest on them in the ETS (for example, if the forest covers two adjacent properties that are both owned by the applicant).

Figure 3 When a forest meets a property boundary (land title in white, land parcel in red), and the applicant does not have a legal entitlement to the forest on the adjacent land, there are two ways to map the boundary of the forest land. (1) When the forest meets or overlaps the land boundary, map up to the land boundary. (2) If there's a visible gap between the forest and the land boundary, draw the polygon along the outer edge of the tree crowns.



Give-and-take and over-boundary agreements

We understand that sometimes forests can be planted across legal bourndaries. This may be under a "give-and-take" or "over-boundary" agreement arranged with the neighbouring holders of the land title.

However, the ETS rules for registering with post-1989 forest land do not recognise these arrangements, even if they are formalised legally.

Parties applying to join the ETS can only include land to which they have an entitlement, through ownership, a registered forestry right, a registered lease, or a Crown conservation contract.

Handling smaller areas of post-1989 forest land

Generally, to be eligible to enter the ETS, the forest must:

- cover at least 1 hectare in area
- be at least (or expected to reach) 30 metres wide on average.

If the size of a polygon is less than 1 hectare, it will be ineligible unless it can be merged with another polygon that is larger than 1 hectare and has the same CAA number.

Note: You cannot have a multipart polygon, i.e. more than one continuous boundary associated with one Shapefile ID.

Read about the rules for post-1989 forest eligibility – MPI website

Figure 4 shows examples of where these smaller areas of forest can and cannot be included within the polygon.

Figure 4 (1) Area of trees less than 30 m can be included in this polygon because it joins onto eligible forest over a gap that's less than 15 m. (2) Areas of trees less than 30 average width that cannot be included because they do not join onto eligible forest land.

Handling treeless areas within post-1989 forest land

Generally, most areas of post-1989 forest land will contain areas within them that don't contain trees. How you handle these depends on:

- the size of the area
- the width of the area
- where it is located (within the forest or at the edge).

Areas you can include

You may include an area of land in the polygon if it is within the forest land (and not at the boundary) and it:

- is less than 1 hectare, or
- does not contain gaps between tree crown edges of more than 15 metres.

Mapping these areas out of the polygon is optional (see figure 5).

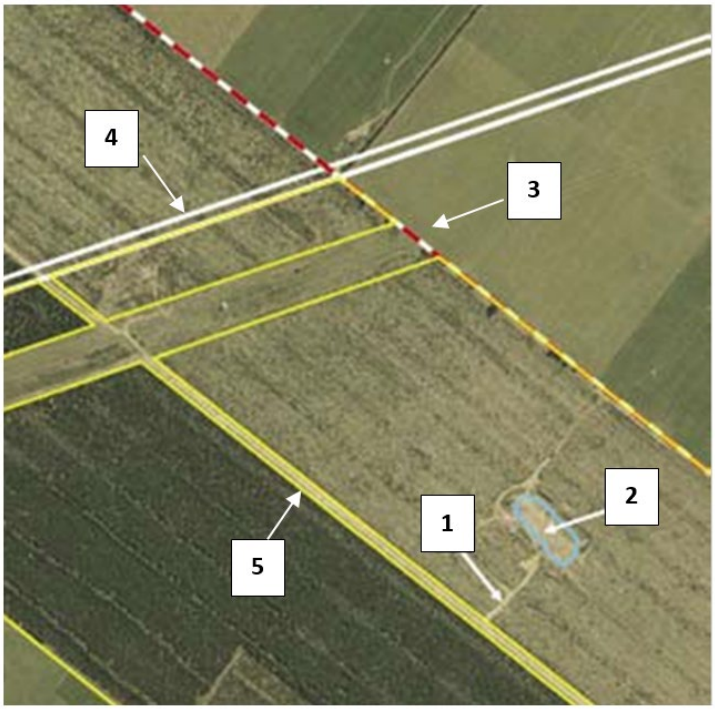
Areas you cannot include

You must remove any areas of treeless land that:

- are larger than 1 hectare
- contain a gap at least 15 metres from the tree crown edges from your forest land polygon
- are on the edge of the forest.

Examples of areas to exclude from the polygons are shown in figure 5 on the next page.

Figure 5 Areas that can be left in the polygons and areas that must be removed. (1) When the forest is mature, this skid access track will be covered by the tree crowns and is less than 15-m wide. This can be left in the polygon. (2) Skid sites are typically less than 1 hectare, so can be included in the polygon. It's optional to exclude these areas. (3) The corridor cleared along the electricity tramsmission line must be mapped out because it is not forest land and it is wider than 15 m. (4) The paper road is excluded from the polygon because the land does not belong to the applicant. (5) The track along the edge of the forest is excluded because it is at the edge of the forest. The polygon must be drawn at the outer edge of the crown of the trees along the edge of the forest.



Handling areas of other forest within post-1989 forest land

Some areas of post-1989 forest land may contain areas of forest within them that have different characteristics. Examples include:

- trees established before 1990 (pre-1990 forest land and other older forest not covered by the scheme)
- vegetation that will never reach the size and crown cover requirements to be considered post-1989 forest land.

Find out about pre-1990 forest land – MPI website

More about land that cannot enter the ETS as post-1989 forest land – MPI website

Read about the size and crown cover requirements for forest land in the ETS – MPI website

The standard allows for small areas of this sort of land to enter the ETS. How you handle these is similar to the guidance on treeless areas above. It depends on:

- the size of the area
- the width of the area
- where it is located (within the post-1989 forest land or at the edge).

Areas you can include in the polygons

You may include areas of trees in the polygon that have different characteristics and wouldn't usually meet the rules for post-1989 forest land (for example, trees established before 1990) if they are:

- within the post-1989 forest land (and not at the boundary), and
- is less than 1 hectare or have a width between tree crown edges of less than 15 metres.

Mapping these areas out of the polygon is optional.

Areas you cannot include in the polygons

You must remove any areas that are:

- larger than 1 hectare
- more than 15 metres from the tree crown edges from your forest land polygon
- on the edge of the forest.

These areas are considered ineligible to enter the ETS.

Subdividing polygons

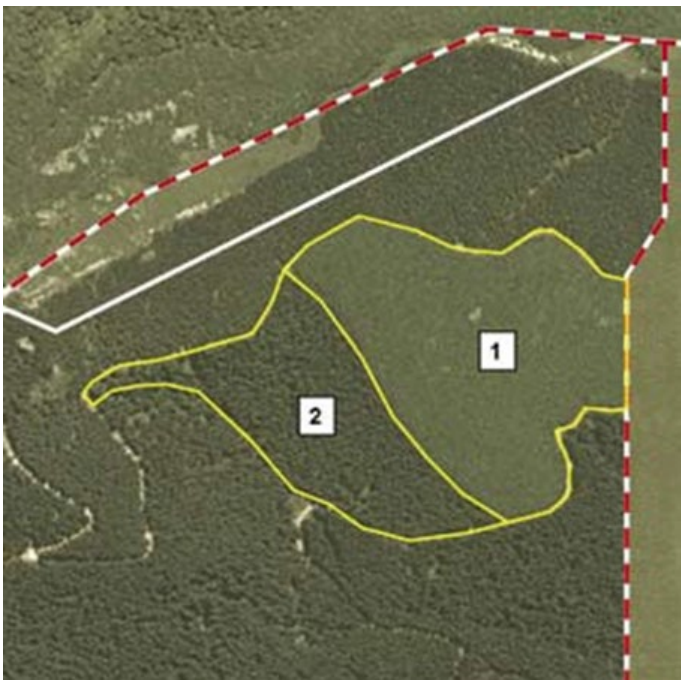
You can split a polygon up into multiple polygons, as long as each of them is 1 hectare or more in size. In figure 6, the applicant has decided to have different polygons for parts of the forest that contain a different tree species.

When applying to register with post-1989 forest land, the applicant must choose carbon accounting areas. The carbon accounting areas are given numbers to identify them. Each polygon in the shapefile must be assigned to a carbon accounting area and given its number.

Carbon accounting areas can include one or more polygons.

Read more about carbon accounting areas and what they are used for – MPI website

Figure 6 The areas indicated by (1) and (2) are both larger than 1 hectare and can be mapped as individual polygons.



Mapping temporarily unstocked areas

As above, you can include unstocked areas within the forest that are less than 1 hectare.

Areas of forest land that have been harvested and are temporarily unstocked may still be considered forest land under ETS rules. You can include harvested areas in the polygons, as long as you can show that:

- you intend to replant the forest within 4 years, or
- you're managing the land in a way that the forest is likely to regenerate within 4 years.

You cannot include unstocked areas of 1 hectare or more if there wasn't eligible forest planted or established previously in that area.

For example, if you plan to establish a forest on land that was previously pasture, you can't apply for this area to enter the ETS until you can show the area contains trees that are likely to meet the definition of post-1989 forest land.

Read about the rules for post-1989 forest eligibility – MPI website

The size and density requirements for forest land in the ETS – MPI website

Note: the rules of the ETS can mean that land can become considered as deforested later if the forest there doesn't meet certain thresholds within 4, 10 and 20 years after clearing.

Find out more about what's considered deforested land under the ETS rules – MPI website

Advice on imagery for mapping

If you're using aerial photographs or satellite images to identify the boundary of post-1989 forest land:

- ideally use images that are detailed enough to see individual tree crowns
- be aware of the date of the imagery being used relative to the age of the forest
- the useability of imagery can be affected by low sun angles (these can cast shadows from the trees at the forest boundary, which can be difficult to separate from the actual edge of forest stands)
- the useability of imagery can be affected by cloud and haze.

Using pre-existing mapping information

If you're planning to use existing maps, check the approach used for the mapping. Make sure the polygons meet the requirements for mapping land in the ETS.

More information

The following pages on the MPI website include additional information about digital file formats, map projection, and attribute data to include. They also provide links to publicly available satellite images and aerial photos in New Zealand.

How to map forestry for the ETS – MPI website

Making sure mapped land is eligible – MPI website

Download our guide about the sort of information to provide with applications to show that land is post-1989 forest land:

Providing information to support your application to register post-1989 forest land in the ETS [PDF, 1.9MB]

The rules for mapping land in the ETS are published in the Geospatial Mapping Information Standard 2022:

Download the Geospatial Mapping Information standard – MPI website [PDF, 530 KB]