

# Master User Guide

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Nofence AS

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# 1. Getting started with Nofence – Quick guide

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1. **Charging batteries:** Start with charging the batteries. It takes 8-10 hours to fully charge the sheep/goat batteries, and up to 14 hours to fully charge the cattle battery. It is therefore important to start the charging process well before you are planning to start the training. A constant green light on the charger indicates a fully charged battery.
2. **Insert battery in collar:** The collar will be switched on when you insert the battery and the [start up audio](#) is played. Make sure the battery is properly fitted in the collar – you should hear a click when the battery is inserted correctly.
3. **Leave collars with batteries inserted overnight:** This is to ensure that all collars are fully updated.
4. **Open the activation email from Nofence:** Click on the link in the email to activate your account.
5. **Download the Nofence app:** Log in to the app and follow the instructions.
6. **Assign the collars to your user:**
  - Make sure that you have switched on Bluetooth on your phone.
  - Go to Collars in the bottom menu.
  - Press + in the upper right corner.
  - All the collars in the nearby area will appear in the list.
  - Select the serial numbers on the list that match the serial numbers of your collars.
  - Press Confirm to add the collars.
7. **Create a new training pasture in the app:** Follow the guidelines for training under the section [Training animals](#). The training pasture should be in a physically fenced area.
8. **Assign the collars to the pasture:** Go to “move” in the bottom menu to set the collars to the

training pasture. Follow the instructions in the app.

9. **Fit the collars to the animals:** Make sure the collars are fitted properly around the animal's neck – it should be tight, but not uncomfortable for the animal. Be aware that some animals will grow during the grazing season. Please see a video of proper fitting [here](#).
10. **Move the animals into the new pasture:** When the position of the collar is registered inside the virtual pasture, the fence will be activated. You are now ready to start the training. Good luck!

To learn more about how the technology works, we recommend checking out the section [How the technology works](#).

Do you have any questions, or need any assistance? Feel free to contact us at [support@nofence.no](mailto:support@nofence.no) or at +44 1952 924012.

## 2. Getting started with Nofence – Videos

Please enjoy a few short videos showing how easy it is to get started with Nofence.



[Introduction](#)



[Turn the collar on and off](#)



[Fitting the collar](#)



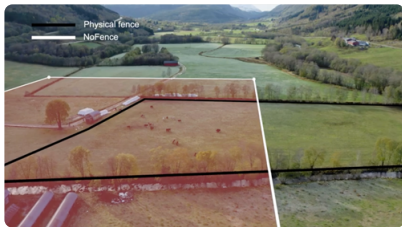
[The Nofence-app](#)



[The Nofence boundary](#)



[Intuitive pastures](#)



[Training animals](#)



[Fencing in difficult terrain](#)



[Moving the animals](#)



[Locating the animals](#)

## 3. Get to know the Nofence technology

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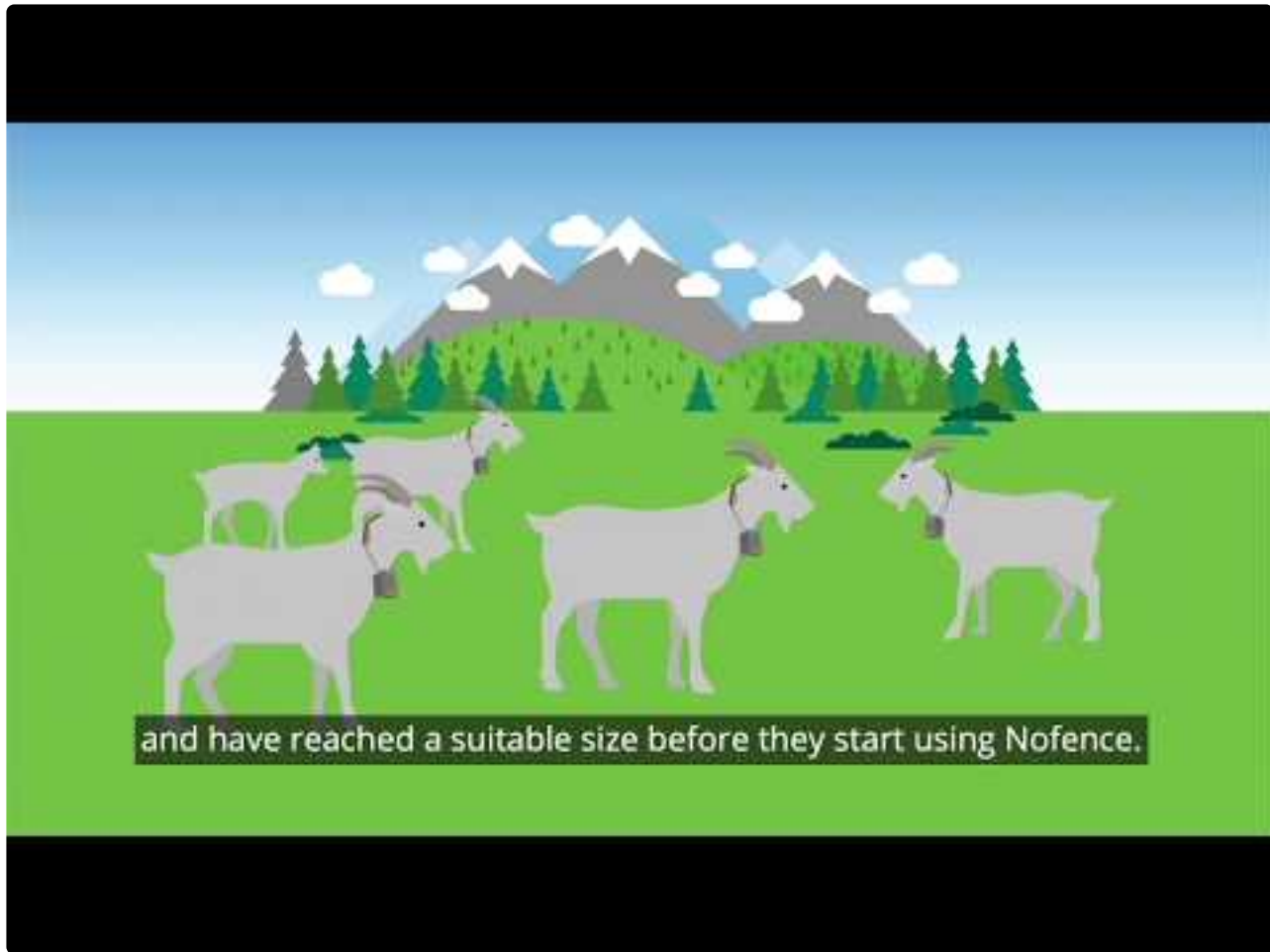
In this chapter we will explain how the Nofence technology works.

## 3.1. Basics

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Our grazing technology consists of a collar and an app that communicate via the mobile network. The collar is equipped with an antenna for GPS positioning and solar panels for recharging the battery. Our technology enables farmers to remotely monitor animals in real time and, in the case of escapes, they will receive notifications in the app.





<https://www.youtube.com/embed/qC-FVhghHSI?rel=0>



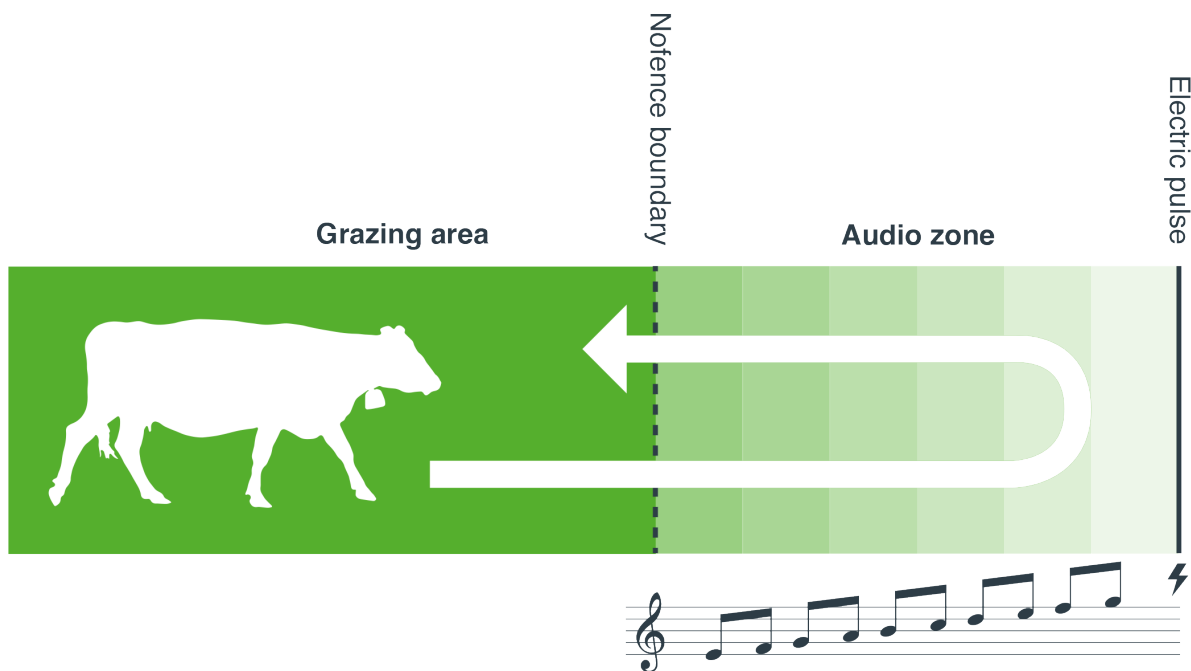
## 3.2. The Nofence boundary

### How is it possible to fence animals with virtual grazing technology?

To keep animals within the virtual pasture boundary, Nofence uses two important elements: Their sense of hearing and their herd instinct. The animals use their hearing ability to identify where the boundary is, and the herd instinct makes them turn around and return to the pasture and the rest of the herd when they hear the audio cue.

### The pasture boundary

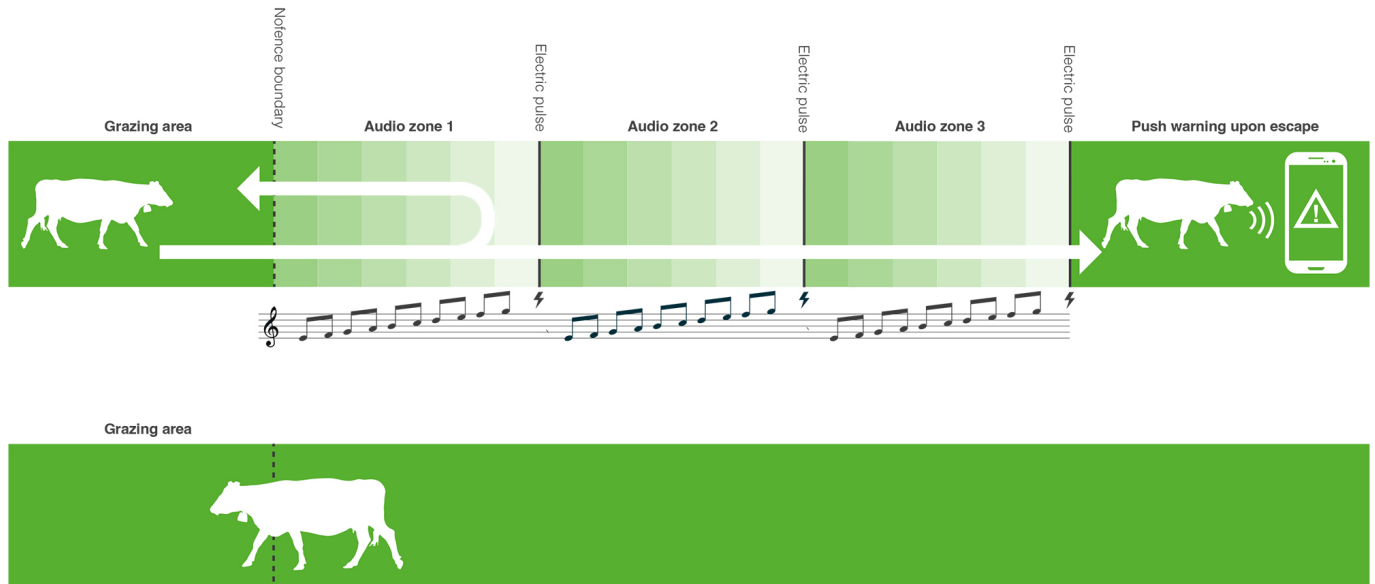
When the animal crosses the Nofence boundary, the collar emits an audio cue. The audio warning starts at a low cue, which gradually increases as long as the animal is outside the boundary. The animal recognizes this audio cue, turns around, and returns to the pasture to avoid the electric pulse.



*The illustration shows the desired behavior. The animal leaves the pasture, responds to the audio cue, turns around and returns to the pasture.*

If an animal escapes and keeps walking away from the pasture, it will receive a total of three audio zones. After the third, the fence function will switch off, and the audio cue and electric pulse will be deactivated. The farmer will be alerted with a push notification via the Nofence app. The collar will keep reporting its position even though the animal is outside the pasture, so you will know where the animal is at all times. When the animal returns to the pasture, the fence is reactivated and the farmer will be notified that the animal has returned.





The illustration above demonstrates what happens if the animal chooses to escape. A maximum of three electric pulses are emitted before the animal is registered as escaped and the fence function is switched off. The fence function is reactivated once the animal returns to the pasture.



A significant difference between the Nofence boundary and a traditional, electric fence, is that the traditional fence is a fixed and absolute boundary, while the Nofence boundary marks the start of the audio cue. A potential electric pulse will come after the Nofence boundary. The audio cue has a certain extent both in time and distance, so that the animal has the time to perceive the fence function, turn around and walk back. The Nofence boundary should therefore be considered a zone, and this should be taken into account when designing the pasture.

### The boundary extent

The electric pulse is only to be emitted if the collar has played all the audio cues in the audio warning. The reason for this is that the system should be predictable and manageable for the animal. It takes at least 5 seconds, and a maximum of 20 seconds to play the audio cue, depending on the animal's speed away from the boundary. If the animal crosses the boundary at high speed, the audio cue will play at fast speed. On the other hand, it will play at a slower speed if the animal is crossing the boundary at a reduced speed. This should be considered when fencing the animals close to a road, especially if the pasture is on a hill so that the animal can move towards the road at a faster pace.

The audio zone is affected by the GPS signal. Poor position accuracy will make the boundary less accurate, and the audio cue can start sooner or later than where the actual boundary line is in the map. If the GPS signal is so poor that the accuracy is less than 3.5 meters, the collar will not emit any audio cues or pulse.

You may experience that the audio zone has a larger variation when the collar is in teach mode vs standard operating mode. Animals that know the system well, know that they can "stop" the audio cue more easily while the collar is in training mode. You can read more about the different operation modes in the chapter Training animals.

If you test the collar yourself while crossing the boundary, you can experience how the audio cue starts

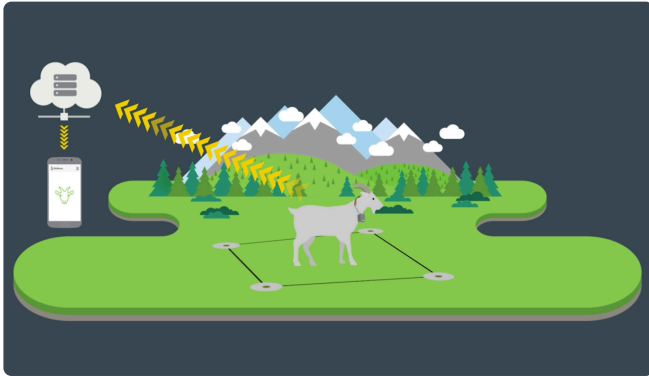
and stops at different speeds. While doing this, please remember to hold the collar correctly, to avoid receiving an electric pulse. Hold the collar by the neck strap, and make sure that you are not touching the chain.



People with heart diseases or a Pacemaker should avoid receiving a pulse from the collar.

## 3.3. Mobile coverage

The collar communicates with the app via the mobile network (2G). We therefore recommend having sufficient mobile coverage in the pasture, if not at least parts of the pasture, so that you can make changes to the Nofence boundary when needed, as well as receive data from the collars if anything happens. All collars will automatically pick the strongest signal, and communicate on this network. The fence function is not dependent on the mobile coverage, as it is not using the mobile network for this, but GPS and other GNSS satellites.



The collar reports to the app every 15 minutes. It reports its position, battery status, which operating mode it is in (teaching or operational) and if it has emitted any audio warnings or electric pulses. If the collar is outside mobile coverage, the status reports will not be sent to the app. If the collar misses a total of three of these reports, the collar symbol will turn yellow in the status map in the app.

As long as the collar is within mobile coverage, you can send information to the collar, for example if you want to adjust the pasture boundaries or give it a new pasture. You can also request real-time information from the collar via the status map. Electric pulses and escapes will be reported immediately to the app, as long as it's within mobile coverage.

When the collar is outside mobile coverage, you will not receive status reports. Neither will you be able to send any information to the collar. If you are bringing the animals home from an area without coverage, you can [remove the pasture by Bluetooth](#).



It is worth noting that the information for each collar in the app is from the last report at all times. This means that if it has been a while since the collar last managed to send a report, the information in the app will be from its last report. The app informs you about when the last report was received.

## 3.4. GPS / Positioning

The Nofence collar will locate its position from the satellite based positioning systems GPS and GLONASS. These systems are not the same as the mobile network, but are used to decide the animal's location, as well as decide when the collar should emit the audio warning and electric pulse. Since it's the positioning systems that make sure the fence is functioning, this will function independently of the mobile coverage on site. This means that the animal will get the audio warning and the electric pulse when the animal crosses the boundary, even though there is no mobile coverage. A lack of mobile coverage will, however, lead to the collar not being able to send any information to the app. As soon as the collar is within mobile coverage again, it will report all the information from the period it was without coverage.

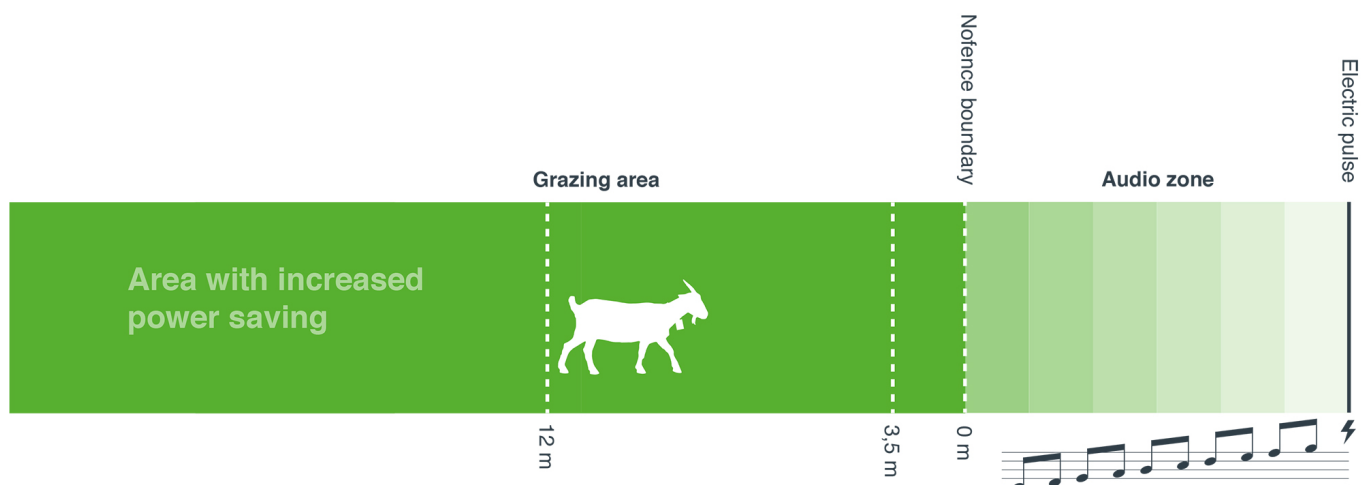


The Nofence collar is dependent on sufficient satellite coverage for the fence function to be active. Satellite coverage is pretty evenly distributed across the country, especially in open landscapes. Factors that may affect the accuracy of positioning are steep mountains, narrow valleys, walls and roofs. If the Nofence boundary is left close to an obstacle, it may cause the collar to not give any audio warnings or electric pulses where the Nofence boundary is. Therefore, distance the boundary from such areas.

the Nofence boundary is. Therefore, distance the boundary from such areas.

To ensure predictability for the animals, the collar is programmed to log positions more frequently when close to the Nofence boundary, so that the audio warnings and electric pulses come at the right time. When the animal is further away from the boundary, it is less important to have high accuracy, and the logging frequency of the animal's positions are minimized in favor of power saving.

*The illustration and table below describe the different zones in the Nofence pasture.*



Distance from the Nofence boundary	GPS accuracy
------------------------------------	--------------

> 12 metres	Zone with increased power saving
12 – 3.5 metres	The GPS receiver prepares. It prioritizes performance over power saving, but the position update is not more frequent than 1 per second
3.5 – 0 metres	Maximum performance with four position updates per second. The collar is preparing to play the audio warning
< 0 metres	The collar alerts the animal that it is outside the pasture by emitting the audio warning

### Drifting

Roofs and walls can reduce the GPS signal, and incorrect positioning can happen – so-called “drifting”. If the incorrect position is outside the Nofence boundary and the system is unable to detect that the position is false, the collar will emit the audio warning at the wrong position. The animal may not understand what to do to stop the audio warning, and the collar would then emit an electric pulse. This is why it is important to use a Shelter Beacon if the animals have access to a barn, a shelter, or a small area with a roof.

A GPS receiver at rest may perceive a better accuracy than it actually has. This is a well-known phenomenon within GPS technology, and is defined as “drifting”. Drifting may cause the collar of an animal who is resting close to the boundary to log false positions. If the incorrect position is outside the Nofence boundary and the system is unable to detect that the position is false, the collar will emit the audio warning. The animal must then move further into the pasture to turn off the audio warning. The risk of this actually happening is small, but can occur if the collar goes into sleep mode when it is closer than 10 meters from the boundary. That is why we recommend leaving a safe margin in areas where you know the animals often are resting. A Shelter Beacon can also be considered in cases like this.

## 3.5. Fitting collars

To make sure the collar is comfortable for the animal, it is important to fit the collar properly.

For Cattle, we recommend that you can fit a fist vertically between the collar and the animal's neck.

For Sheep and Goats, we recommend a space of approximately 4 cm or two fingers vertically. Correct fitting is important – a collar too loose can bang against the animal's neck, and there can also be a danger of the animal getting a foot stuck between the collar and the neck, or that it gets stuck on something. On the other hand, a tight collar can be uncomfortable for the animal, and lead to chafing.

Observe how the collar is hanging when the animal is grazing and walking around, and adjust the collar if needed. If your animals are less tame, it can be easier to use two people when fitting the collars.

! Remember that young animals can grow quite a lot during a grazing season. Therefore, include checking the fitting as part of the routine when you are checking on the herd. Animals with a lot of wool should be checked closely, as the wool can make it difficult to actually determine how tight the collar is fitted.



[https://www.youtube.com/embed/\\_yBDjZq7reQ?rel=0](https://www.youtube.com/embed/_yBDjZq7reQ?rel=0)

- \* Recommendations for sheep: Some individuals may get wounds on the underside of the jaw if the collar is too loose, as the collar will then hit the jaw on the wrong place when the animal is grazing. Therefore, ensure that the collar is properly fitted (see the video), and feel free to leave some of the wool under the jaw when you are cutting the wool off the sheep.



*This collar is too loosely fitted.*





*This is perfect :).*



*The collar is well fitted if you can lift the neck strap like this (but not any further).*



### Fitting collars on smaller animals

Calves, lambs and goat kids have to be big enough before they start using Nofence. Two factors have to be taken into account:

- The animal is sufficiently mentally developed to understand and master the connection between the audio warning and its own behavior
- The animal has sufficient physique and size to carry the collar without it inhibiting the animal's behavior

There is great variation between each individual, breed and species. Nofence does not have a basis for giving an exact limit on when the animals are big and old enough. When young animals start using Nofence for the first time, it is important that the owner observes the animals.

It is also essential to check that the chain is in contact with the animal's neck. If the neck is too small in relation to the length of the neck strap, the contact points will come too far down, and the animal may not feel the electric pulse. Efficient delivery of the electric pulse ensures that the animals learn how the system works and to respect the Nofence boundary.



<https://www.youtube.com/embed/vHCEzgjFuQY?rel=0>

## 3.6. Training animals

- ✿ For your animals' sake it is essential that the learning process is well-organised and thought-through. When the animal caretaker has prepared well for the training, the animals experience a more efficient learning process, with as few electric pulses as possible. Spend time observing your animals as they undergo the training.



<https://www.youtube.com/embed/yIQtoWld0vs?rel=0>

### Before you start the learning process

- Learning must take place in a location with satisfactory mobile and GPS coverage. If you have any doubts, you should conduct a test by walking around with a collar in your hand.
- The animals must have a sense of security in the area where the learning takes place. Let them spend time getting acquainted with the area before the training starts.
- We recommend creating the training pasture somewhere you can monitor the animals' progress. By observing the animals during the training period, you learn how they respond to the system.
- All adult animals must wear a collar to safeguard animal welfare. In herds where some animals wear collars and others do not, the animals wearing collars will ignore both audio warnings and electric pulses in order to follow the herd.

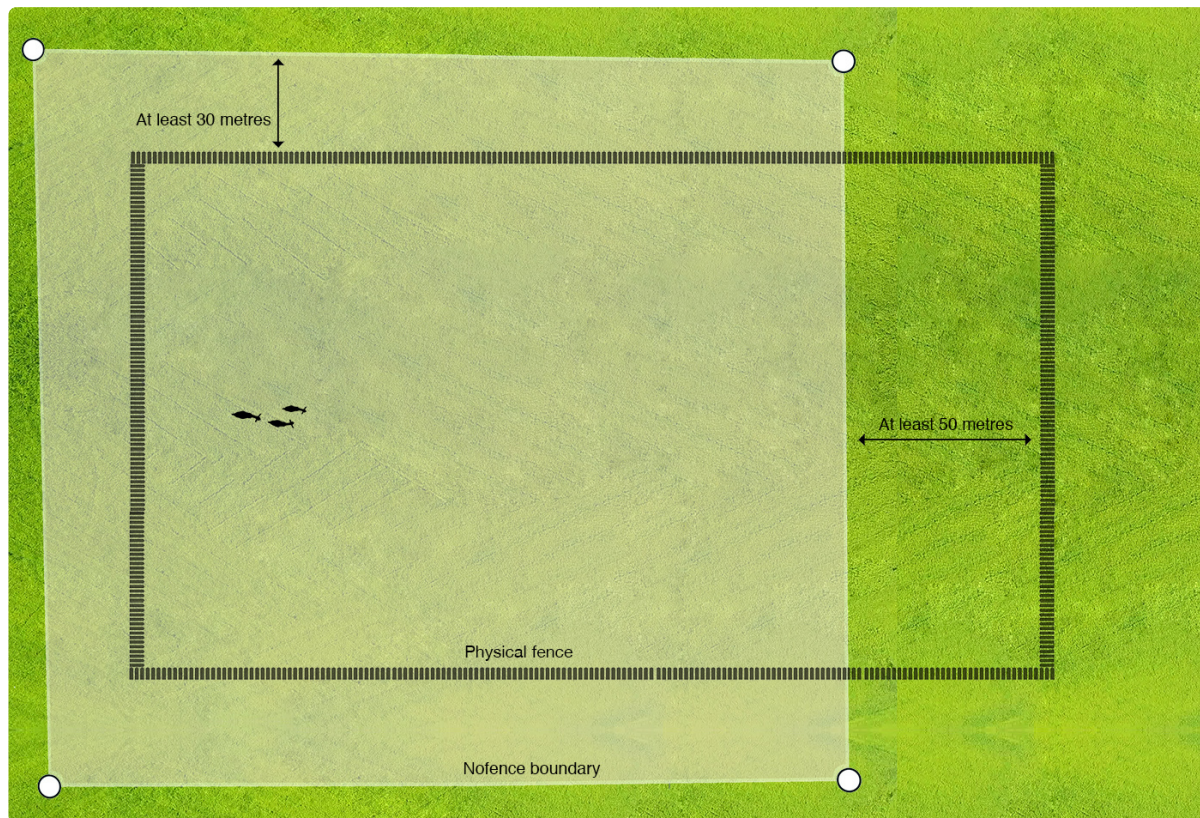


- The training pastures should be small enough for the animals to encounter the Nofence boundary during the training, but large enough for the animals to run about.
- Training pastures that are too big will result in few encounters with the audio warning and the training will take longer.
- If the training pasture is too small the animals can become restless, as they will meet a new boundary in the attempt to get away from another. Give them enough room to run about.

The animals should be well-acquainted with the system before left unattended in their Nofence pasture. Leaving the animals without supervision before they have learned the relationship between the audio warning and the electric pulse will lead to escapes.

### The training pasture

The training pasture is fully fenced in with a physical fence. The physical fence is shown as black fence posts, while the Nofence boundary is illustrated by a white line between white corner posts.



The Nofence boundary cuts off a part of the existing pasture area. We recommend cutting off a part of the pasture that the animals will seek out for grazing as they have to cross the boundary to learn how the system works. There should be plenty of space outside the Nofence boundary (at least 164 ft / 50 meters) so that they have the ability to escape through all three warning fields and calm down before encountering the physical fence on the opposite side.

When you start training your animals, the first electric pulse will often result in an escape, and you should equip yourself with some grain to lure animals back into the Nofence pasture. It is important that

you are present during the learning process until you observe that the animals respect the audio warning and turn around when the scale starts playing.

The most important aspect of the learning process is that the animals learn they can turn the audio warning off by turning and going back into the Nofence pasture. Therefore, it is important that the boundaries are set in a manner that makes them logical to the animals. Create a simple pasture with simple boundaries.

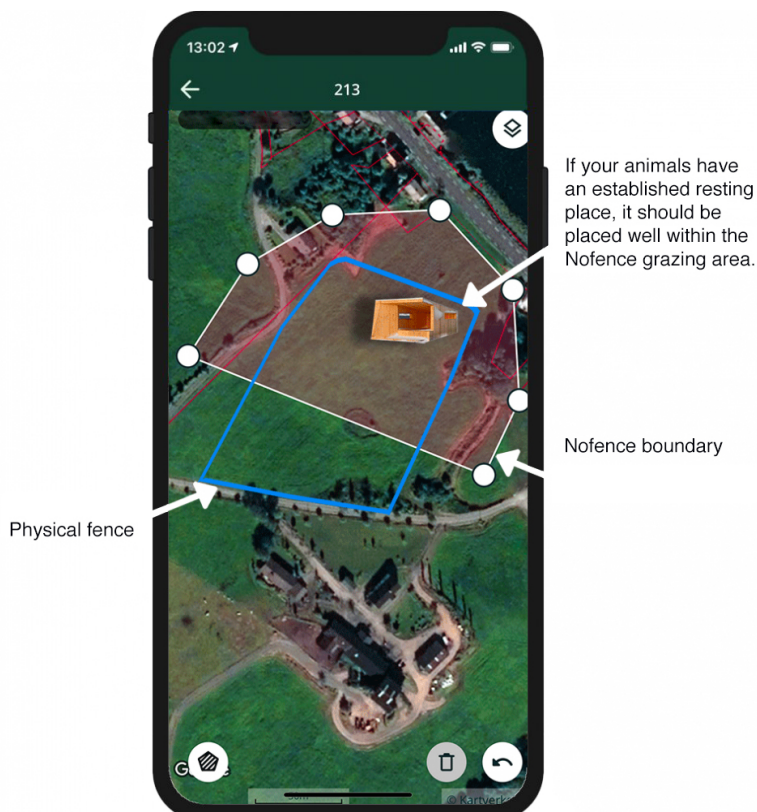
Most animals will understand the relationship between the audio warning and delivery of the electric pulse during the first three days of the training. When you see that the animals in the herd are well-acquainted with the system and turn around when they hear the audio warning, you can consider removing the physical fence from the training pasture. As a general rule, the animals should spend 1-2 weeks on the training pasture before they are given a fully virtual pasture.

It's important not to make frequent changes to the Nofence pasture in the beginning of the training process. A stable and logical boundary makes for a more efficient learning process.

We recommend creating the training pasture in the vicinity of your home, so that you can monitor the animals' progress. By observing the animals during the training period, you learn how they respond to the system. Should you observe conditions that you need time to correct, gather the animals and disable the collars via the mobile app.

When the animals have learned to master the connection between their behaviour and the audio warning, they can be moved to new pastures without using physical fences.

### Example of good pasture design



## Example of poor pasture design



\* The collar has two modes: operating mode and teach mode. The audio warning is more easily switched off in teach mode than in operating mode – which makes learning how to switch off the audio warning easier for the animal. You as a farmer, on the other hand, will probably feel that the pasture border is inaccurate when in teach mode.

! Are you new to keeping livestock? Make sure to allow your animals enough time to get to know their new grounds before embarking on the training. The animals should know and feel safe in the area where the training takes place. Experience shows that they establish a sense of security in a completely new location after approximately one week. However, this period will depend on several factors, such as the make-up of the herd and the individuals in it.



## 3.7. Shelter Beacons

- \* The Nofence shelter beacon is a Bluetooth unit which disables the collar's GPS receiver. It should be used inside buildings to prevent animals from receiving wrongful audio cues and electric pulses due to signal deflection.



### Why use shelter beacon?

Environmental factors can cause degraded GPS signals. A roof can interfere with the collar's ability to receive accurate GPS signals, which may cause the position to drift. If the drifting position is logged outside of the Nofence boundary, the collar may emit audio warnings and electric pulses. This is why we recommend using a shelter beacon if your animals have access to a barn or a shed.

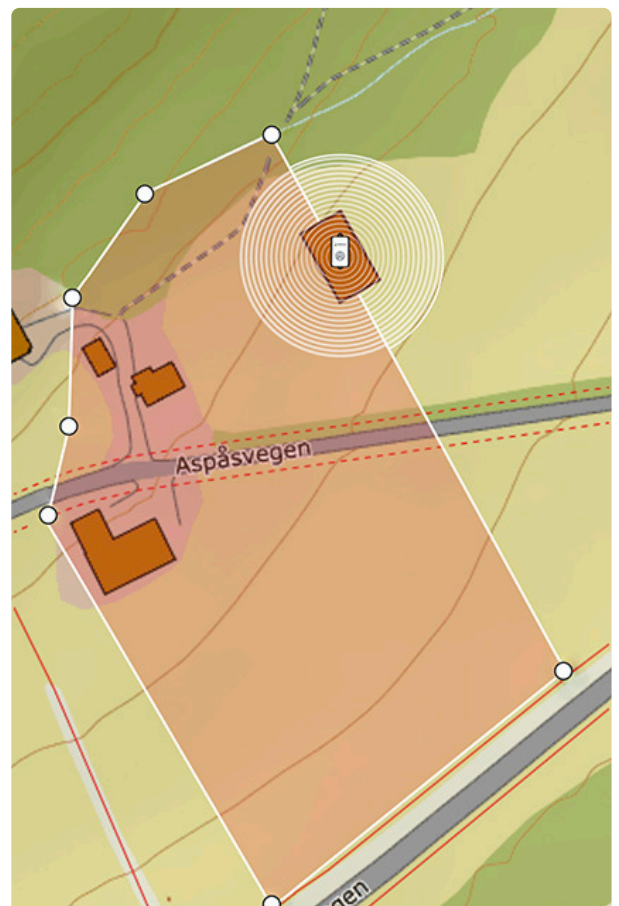
When the collar picks up the signal from the shelter beacon, the operating mode is disabled. Whenever the animal moves out of the shelter beacon's range, the operating mode comes back on.

The reach of a shelter beacon is approximately 10 metres, depending on physical obstructions. The Bluetooth symbol will appear in the app when the collar has contact with a shelter beacon.

To check the reach of a shelter beacon, you should take a collar in your hand and walk around with it to see when the beacon symbol appears in the app. Beware that the reach can vary depending on several factors, such as the animal's body facing towards or away from the shelter beacon, or any concrete walls obstructing the signal.

In larger rooms, we recommend using several shelter beacons. If the animals often lay down alongside the outside walls of the building, you should also consider placing shelter beacons here. Observe where the animals lay down to rest to estimate where the beacon should be installed.

The use of shelter beacons also reduces the collar's



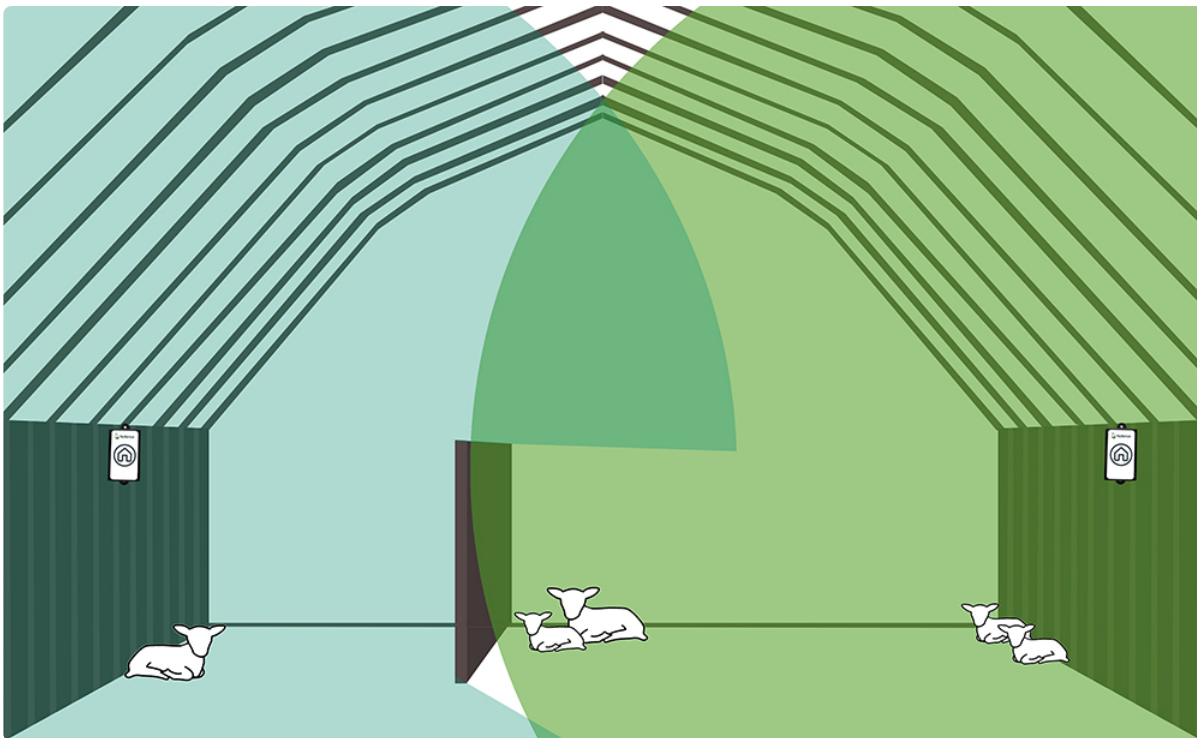
power consumption under such conditions, as it spends considerable energy trying to find good GPS positions under difficult conditions. As soon as the collar enters beacon mode, the energy consumption plummets.

The shelter beacon has an IP rating of 66.

Be aware that a shelter beacon could make a dent in the Nofence boundary if the reach tangents the boundary.



**This is the symbol you will see in the app when the collar is in contact with the shelter beacon.**

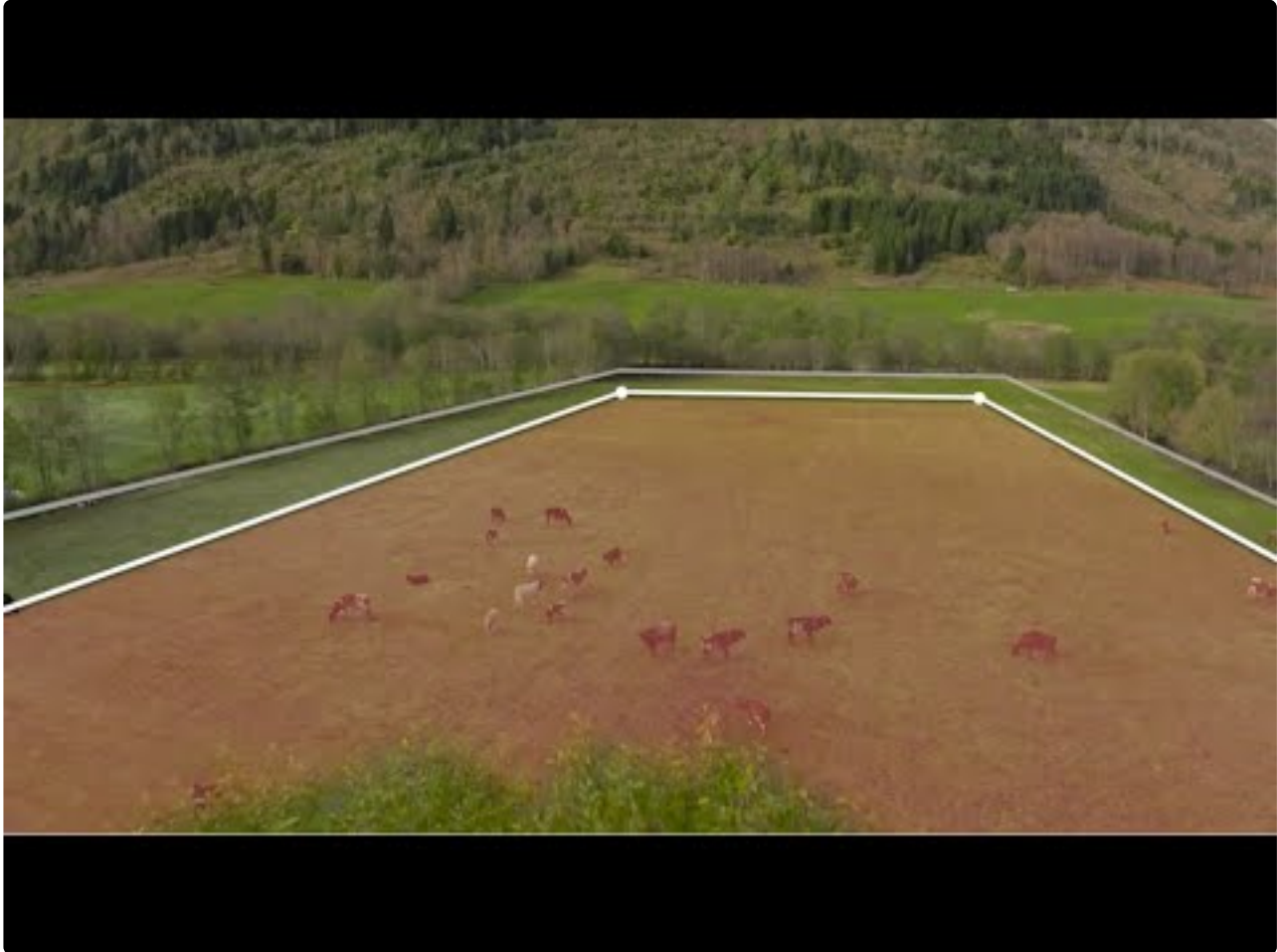


Please note that the connection will take some time. The animal can therefore move outside the pasture before regaining active fence function.

## 3.8. Good pasture design

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Creating pastures with Nofence is easy. With just a tap on the screen you can place virtual fencing posts wherever you want in the terrain, regardless of slope and ground conditions. However, an easy pasture is not necessarily a good pasture for your animals. In this section, we have gathered our recommendations to help you optimize your pasture design.



<https://www.youtube.com/embed/xEDoLHyeoCY?rel=0>

**A well-designed pasture should have:**

- **Sufficient space.** The animals should have enough space. Four goats in a 50mx50m area is too small.
- **Access to food and water.** A lack of access to food and water may cause the animals to escape from the pasture.
- **Angles of 90 degrees or more.** Sharp corners or narrow corridors may confuse the animals.
- **A design that maintains the animal's natural instinct.**
- **A safe distance from dangerous areas in the environment.** The pasture boundary is where the audio warning starts, not where the animal stops to turn around.
- **Appropriate fencing in areas with buildings or barns.** Avoid GPS shadows or drifting by leaving a fair distance between the obstacles and the pasture boundary.

Below, we have outlined some of the points above on a deeper level. The illustrations demonstrate good and bad pasture design. Please be aware these illustrations are general. It is important to use your own



knowledge about your own pasture and animals to design good pastures that are suitable for your use.

### **Sufficient space**

There can be great variations in topography, number of buildings in the pasture, access and quality of feed, number of animals in the pasture, etc. It is, therefore, difficult to have a standard recommendation on how large a pasture should be or the stocking density. However, the pasture should be big enough so that the animals can turn around after crossing the boundary, without interacting with the boundary again straight after turning around. The distance between the boundaries should therefore be more than 25 meters. Animals that are still learning the system should have more space than animals that have used the system for a longer period of time.

### **The animal's instinct**

It is important to be aware that sometimes the animal's instinct can be stronger than the desire to avoid the electric pulse. If the pasture does not satisfy the animal's basic need for food and water, they may escape.

Nofence allows you to split herds into different pastures. You need to consider the animal's instinct if you wish to be successful in splitting herds. The herd instinct varies between animal type and breed. When the herd instinct is strong, keeping animals apart becomes increasingly difficult. The different pastures should have enough distance in between them so the animals in the different groups cannot see, hear or smell each other.

### **Fencing close to buildings**

As described in "GPS/Positioning", walls can affect the GPS signal and cause it to be less accurate. The first illustration below shows the Nofence boundary placed at the same line as the house wall. In this case, you will experience that the animal can cross the pasture boundary without receiving any warnings. This is because the building affects the GPS signal, and with an inaccurate GPS position, the collar will not give any audio warnings or pulses. However, when the animal gets out in a more open area, the GPS accuracy will increase and the warnings will start.

In the second illustration below, the Nofence boundary is left with more space from the building, and there is no risk of the GPS signal being affected.



### Pastures close to the farm yard

If you want the animals close to the barn, but not in the farm yard, it may be an option to combine the Nofence boundary with a physical fence. In the illustration below, we have left the virtual boundary far from the farm yard, and marked in red where it would be appropriate to leave the physical fence.



### Inappropriate use of Exclusion zones

Make sure that the different exclusion zones have enough distance between them. If the distance is too

short, you may risk that the animals become trapped between two boundaries, and have trouble maneuvering their way out. Since the GPS positions always have a certain inaccuracy, we recommend at least 25 meters between the boundaries. In the illustration to the left, a line of trees has been excluded by leaving an exclusion zone for each tree. A better solution here is to create one large exclusion zone for all the trees. This makes it easier for the animals to understand.



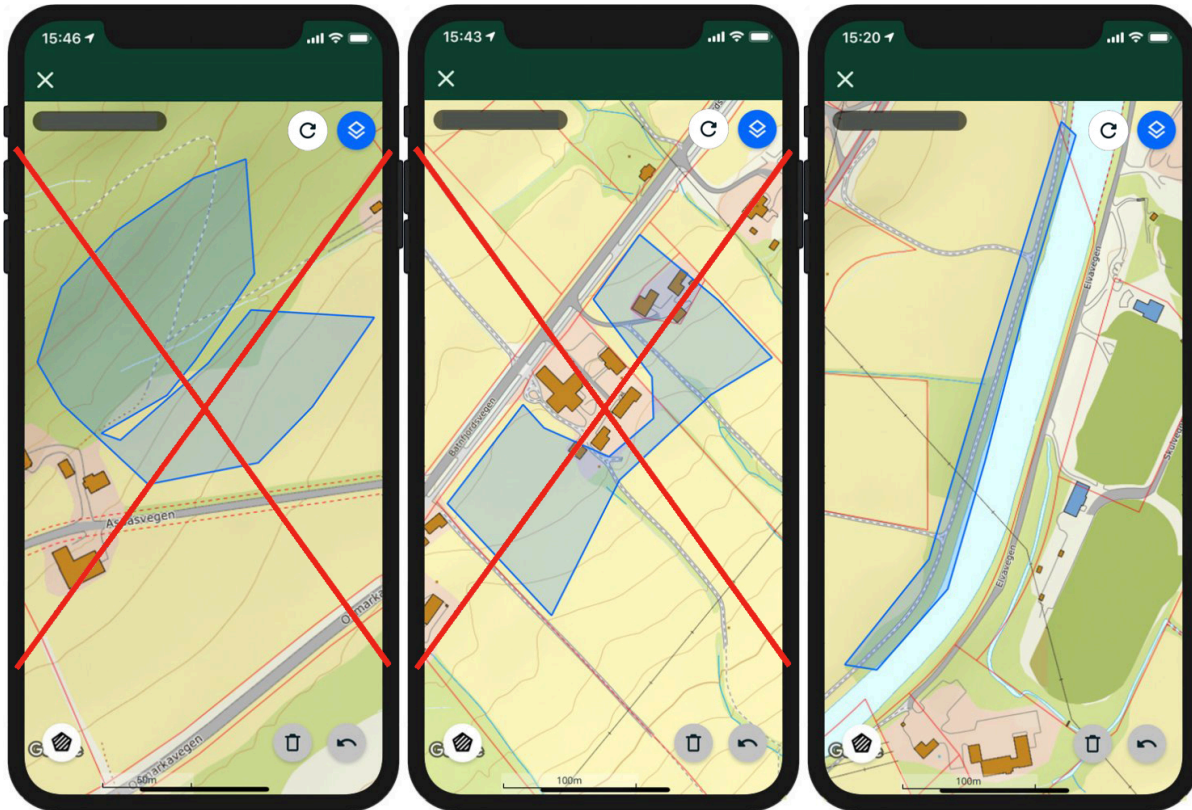
### Fencing close to dangerous areas

If the pasture is located close to a dangerous area that you do not want your animals to access, like a busy road, it is important to leave the Nofence boundary with enough distance from it, so that the animals turn around before they reach the dangerous area. A good idea can be to take a single collar and test where the audio warning starts. If a dangerous area is at the bottom of a hill, we recommend placing the Nofence boundary further up the hill. The animals will often be traveling faster as they move downhill and therefore may move towards the boundary more quickly, which can increase the distance of the Nofence boundary zone.

### Narrow pastures

Below, you can find three different examples of narrow pastures. In the illustration to the left, the pasture has a narrow corridor in between it. If some animals are on one side of the corridor, and other animals on the other side, they may cross the corridor just to get to the rest of their herd.

Pastures with a narrow design may confuse the animals as they will meet the pasture boundaries wherever they move. After the training period, the animals have learned to turn around on the audio warning. Therefore, they should not meet a new audio warning after doing as they have learned. Narrow pastures can also lead to GPS inaccuracy when the animal is laying still and resting, something that may lead to audio warnings and electric pulses inside the pasture. Remember that experienced animals can handle narrow pastures better than animals that recently have been introduced to Nofence.

**Tip:**

Avoid corridors or pastures narrower than 25 meters. Rather combine Nofence with physical fences on one side of the pasture. If the pasture goes along a sea, you can leave the pasture boundary out in the water. This way, you can save battery life-time.

**Knowledge-based adjustment of the pasture boundary**

In the app or in the web portal [my.nofence.no](https://my.nofence.no), you can find an overview of the animals movement patterns. You can also view where the animals have received audio warnings and electric pulses. We recommend using this information to identify areas where the pasture boundary should be adjusted. Also when an animal escapes, it is important to investigate the cause of it. This way, it can be prevented from happening again.

## 4. The app

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As a Nofence customer, you get access to the Nofence app when we ship your collars. An activation email has been sent to the email address – follow the instructions in the email to create a password. Your username is your email address, then download the app from App Store (iOS) or Play Store (Android).

If you have received your collars, but still can't find the activation email in your inbox, use the app to request a new activation email. Open the app and press on the “new user? Please activate your account” heading. Then select “Have you not received the activation email?” and enter the correct email address. Then confirm by pressing “Send me the activation email”. If you enter another email address than the one you are registered with in our system, an error message will appear.

























To get started, you need to download the Nofence App. It is available in the [App Store](#) and the [Play Store](#).










When your collars are on the way, you will receive the activation email. Click on the link in your activation email to set up your Nofence user password. After setting up your Nofence user, you are ready to log into the app. Remember to press “allow the app to send alerts” so that you are notified of any power outages and other necessary alerts.

The same username and password are used to log into the webportal [my.nofence.no](https://my.nofence.no).



## 4.1. Symbols used in the app

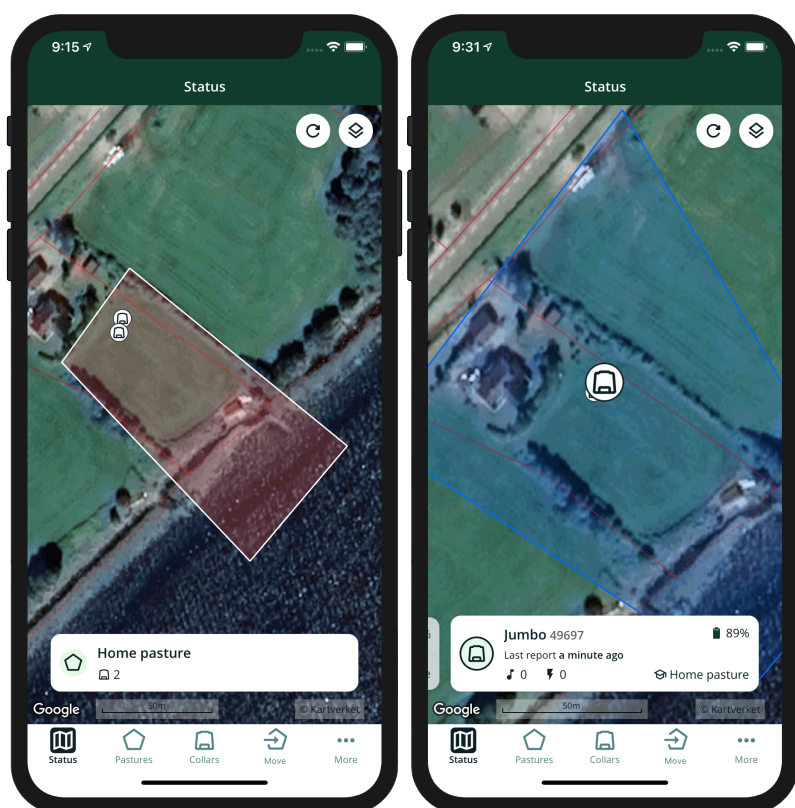
	Cattle collar		Sheep and goat collar
	Report missing. This means that the collar is unable to report over the mobile network, and can be caused by poor mobile coverage or an defective collar. The operating mode may still be working.		Report missing. This means that the collar is unable to report over the mobile network, and can be caused by poor mobile coverage or an defective collar. The operating mode may still be working.
	The animal has escaped, the collar is out of power or the collar is not moving		The animal has escaped, the collar is out of power or the collar is not moving
	Add new (collar or pasture)		Status
	Pasture		Exclusion zone
	Operating mode on		Operating mode off
	Delete marked post or marked pasture		Area
	Collar can be moved to new pasture		Escaped
	Collar has Bluetooth-contact and can play the localization tone		Collar lacking Bluetooth-contact and can therefore not play the localization tone
	Bluetooth		Bluetooth disabled
	Help		Info
	Undo (one step back)		Shelter beacon

	Lacking position		Reorder list
	Time since last report		Remaining battery life in percentage
	Number of audio warnings in the past 24 hours		Number of electric pulses in the past 24 hours
	Show map or satellite		Teach mode
	Update status		

## 4.2. Status

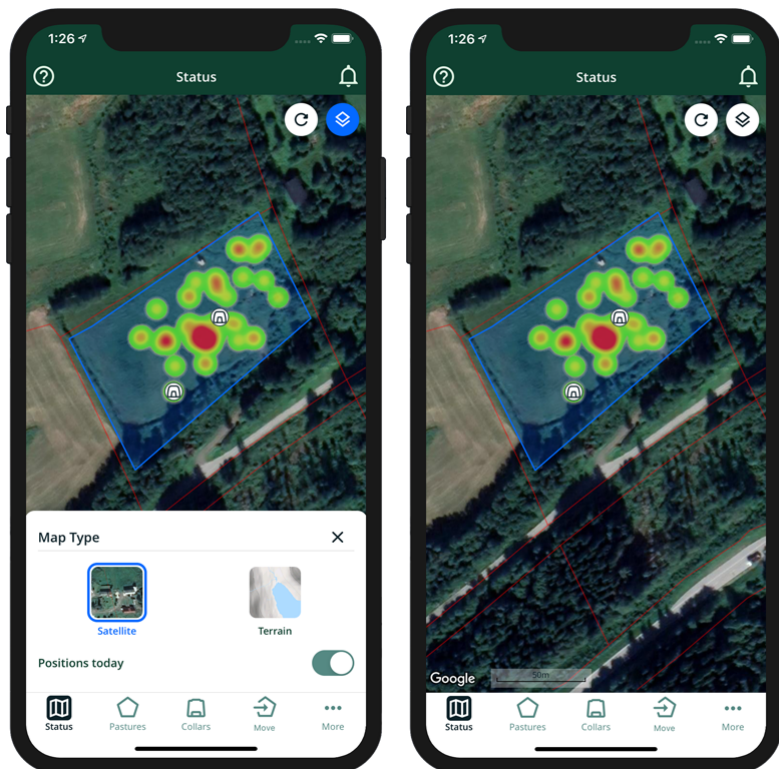
### The Status page

When you open the app for the first time, you are welcomed by the status page. An automated tutorial guides you through the different app functions. Once the collars are activated and assigned to a virtual pasture, the Status page will show active pastures and the assigned collars. By clicking on the Nofence pasture in the status map, information about the pasture and the assigned collars will appear. Click on the information box to find more detailed information, or to make changes to the pasture.



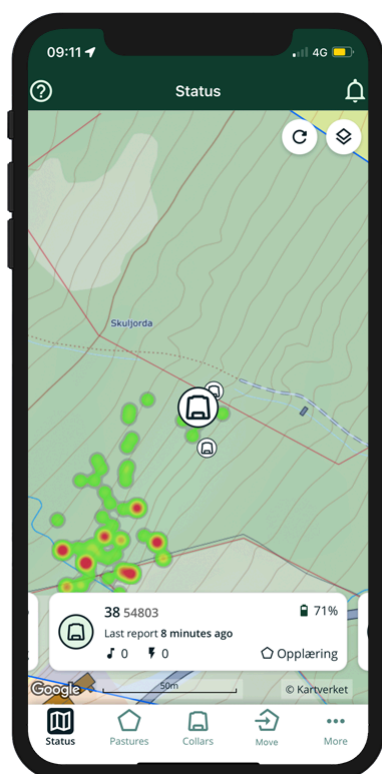
### Heat map on status screen

To view the heat map on the status screen, click on the white icon for map layers in the upper right corner of the Status screen. Slide the *Positions today* button to the right to switch this functionality on. The heat map will show the movement patterns of the herd in the pasture over the last 24 hours.

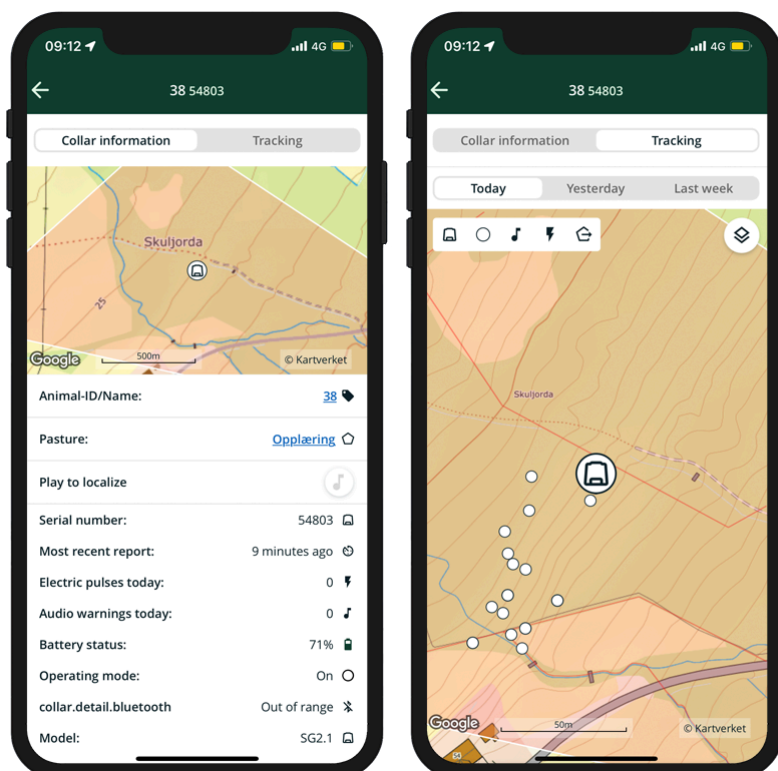


The app also gives you information about how many audio warnings, electric pulses and escapes the animal has had for today's date. This data can be found in different parts of the app; by clicking on a collar in the status map, or via the collar list.

If you click on one of the collar icons on the status page, an information box will appear. Click on this to get more information about this particular collar, or swipe the info box to see information from another collar.



If you want to see more information about the collar, click on the information box. To see positions registered today, yesterday or last week, click on *Tracking*. A map will appear with an overview of the registered positions and happenings. Information about each collar's activity levels over the last week can be found by clicking *More* and then *Statistics and Analysis*.

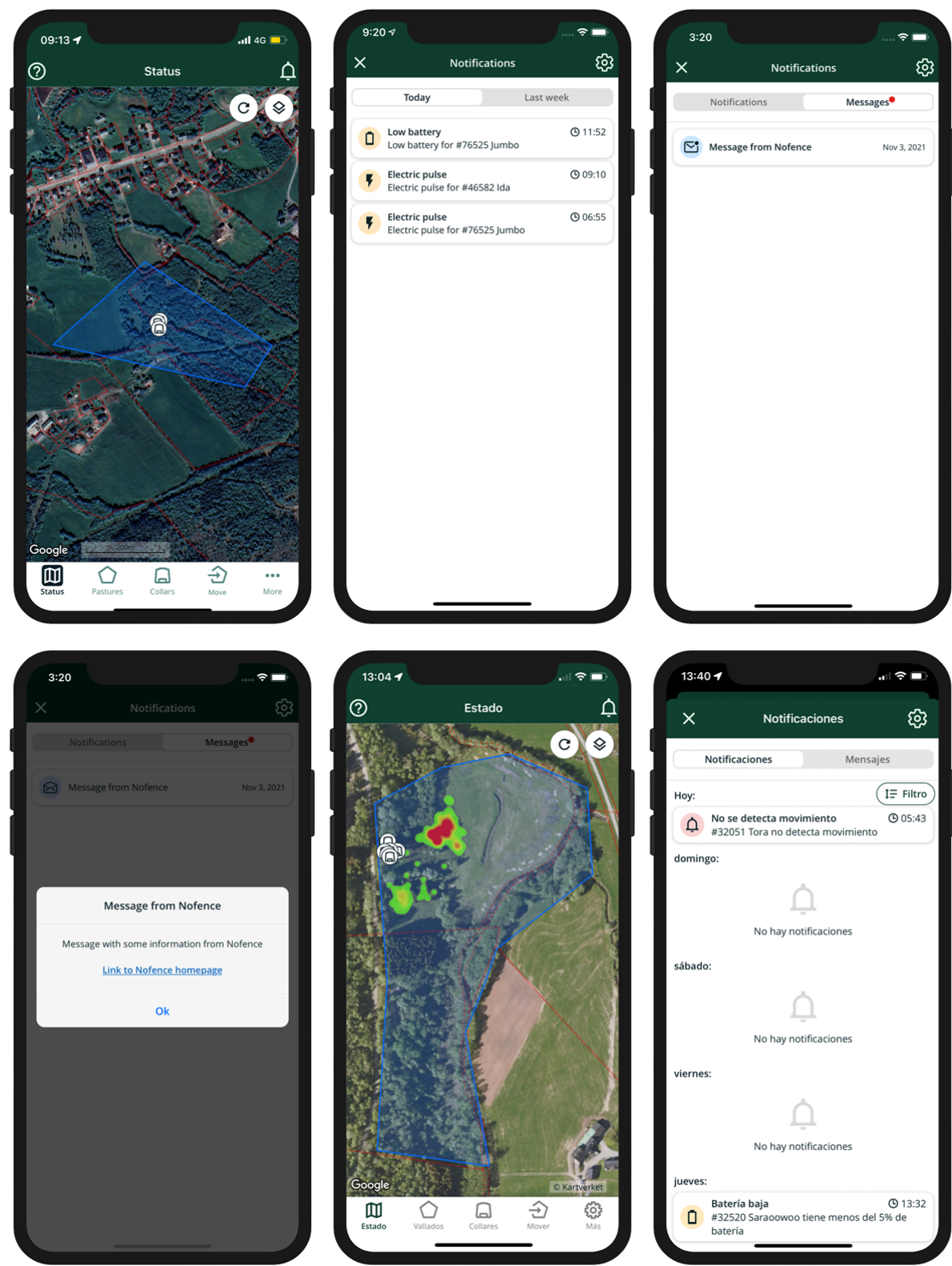


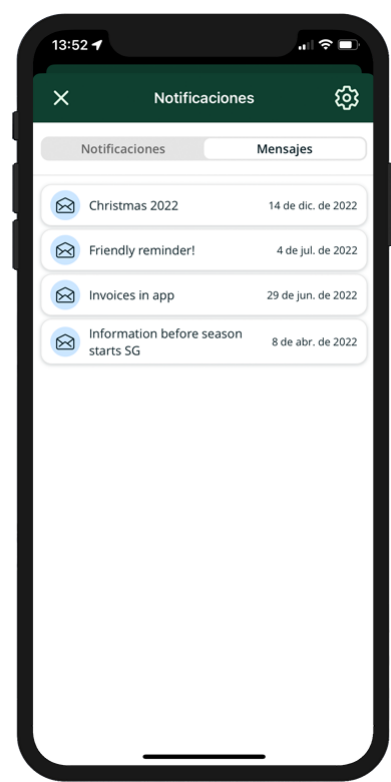
## Notification center

Use the notification center to see the push notifications for the past 24 hours or the past week. From the Status page, press on the bell icon in the upper right corner.

To get to the message inbox, click on *Messages*. You will be notified of a new message with a push notification on the phone. A red dot on the Messages sign indicates unread messages to you from Nofence. Please note that you cannot reply to messages received via the Notification center.



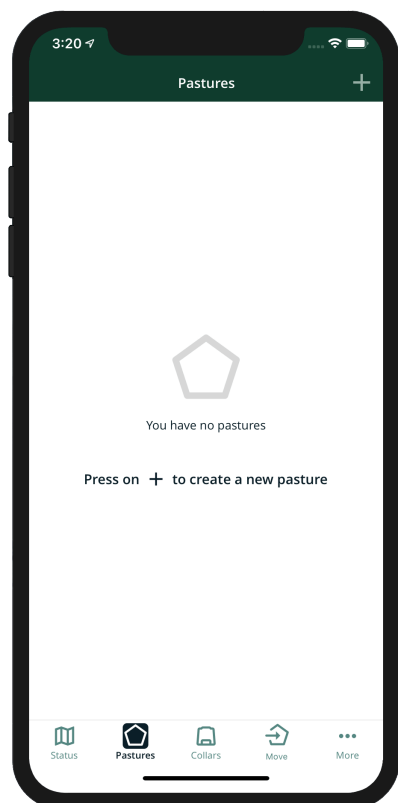




## 4.3. Pastures

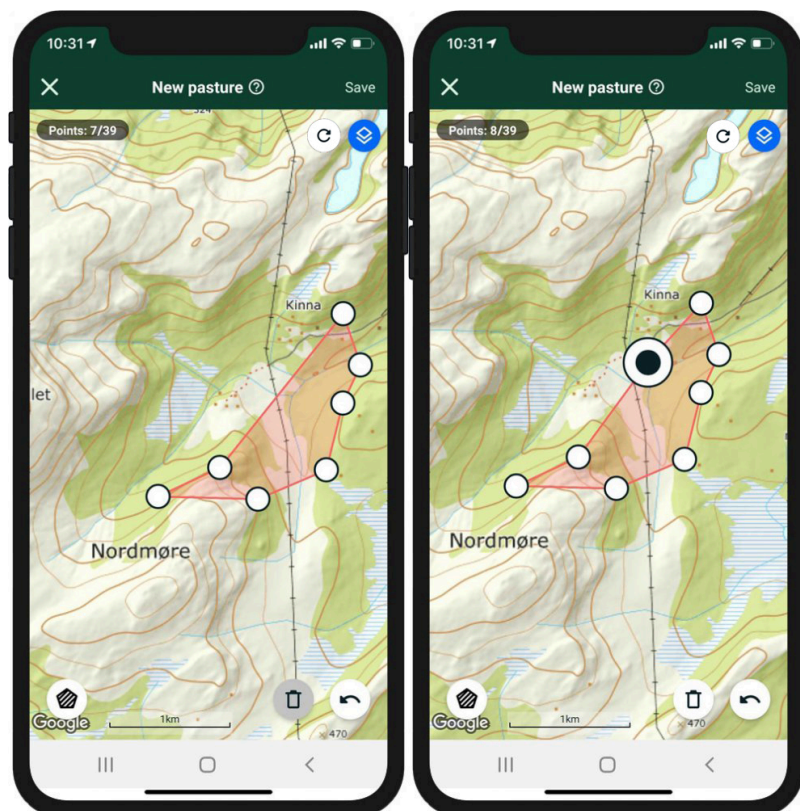
---

Press “Pastures” in the main menu, this is what you should see:



Follow the instructions in app. This will take to a map. You can choose between several map types – satellite map, standard map and aerial photos. The blue dot on the map is your current position. Put your finger down on the place where you want to drop your first virtual fence post. This can be adjusted later, so it is not critical to get the position right to start with.

Keep tapping to position the other virtual fence posts. After the third post the app will create a polygon. If you keep adding posts the pasture will expand. You can adjust the position of the posts by holding them down and moving them around. To delete a post, press it followed by the trash bin symbol. Once you are happy with the design of your first Nofence pasture press SAVE in the right corner, and give it a name.



Useful tip: read our section in good pasture design to master your new fencing method: [Good pasture design](#).

## Exclusion zones

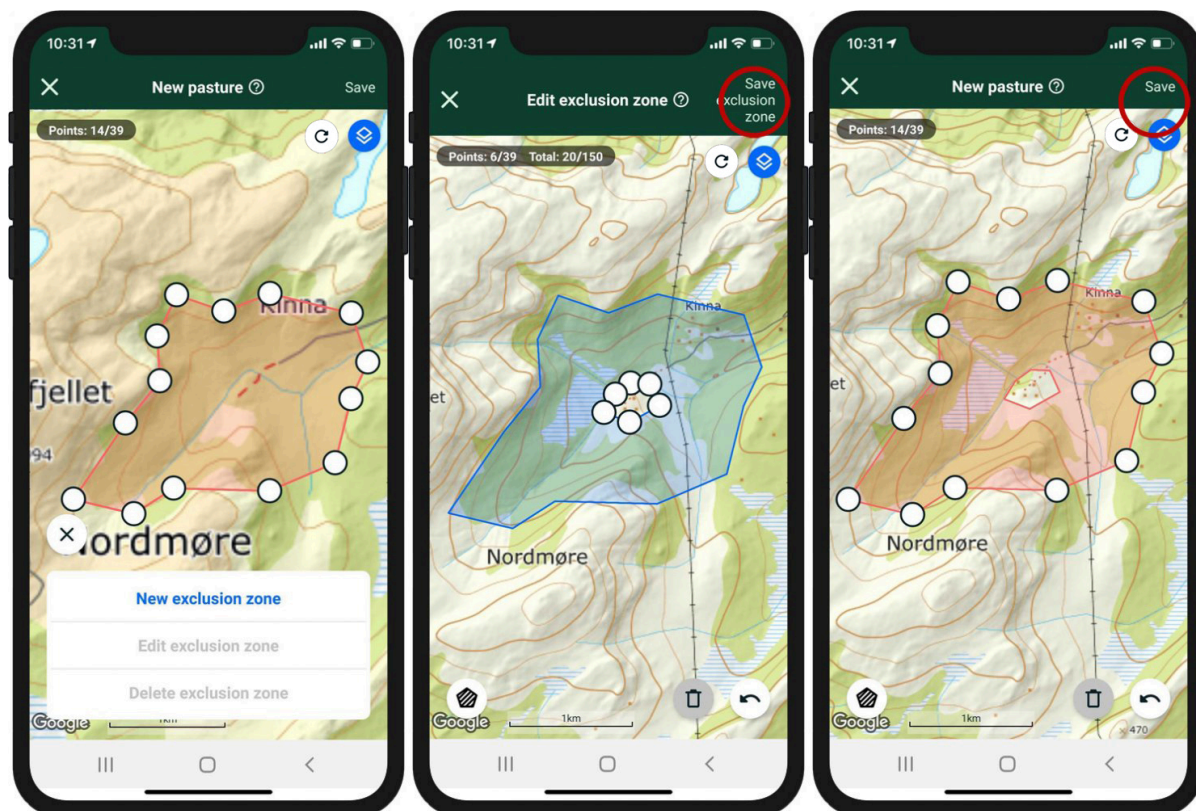
Use exclusion zones to close off areas of the pasture that you want to prevent the animals from entering, such as dangerous cliffs/drops, shelters, waterways or marshland.

To create exclusion zones inside the pasture, go to the Pastures option in the menu and select the pasture you want to edit. Press Edit pasture boundary, followed by the symbol for exclusion zones on the lower left. Three choices will appear, press New exclusion zone. Create the exclusion zone in the same way as you created your pasture. Be aware that all exclusion zones must be inside the boundaries of a pasture, and you can create a maximum of nine exclusion zones per pasture. Press “Save exclusion zone” on the top right when you are satisfied. You will return to “Editing pastures”.

\*Remember to press “Save” on the top right on the next screen, and confirm by pressing Save, and update collars, otherwise the changes will be discarded.

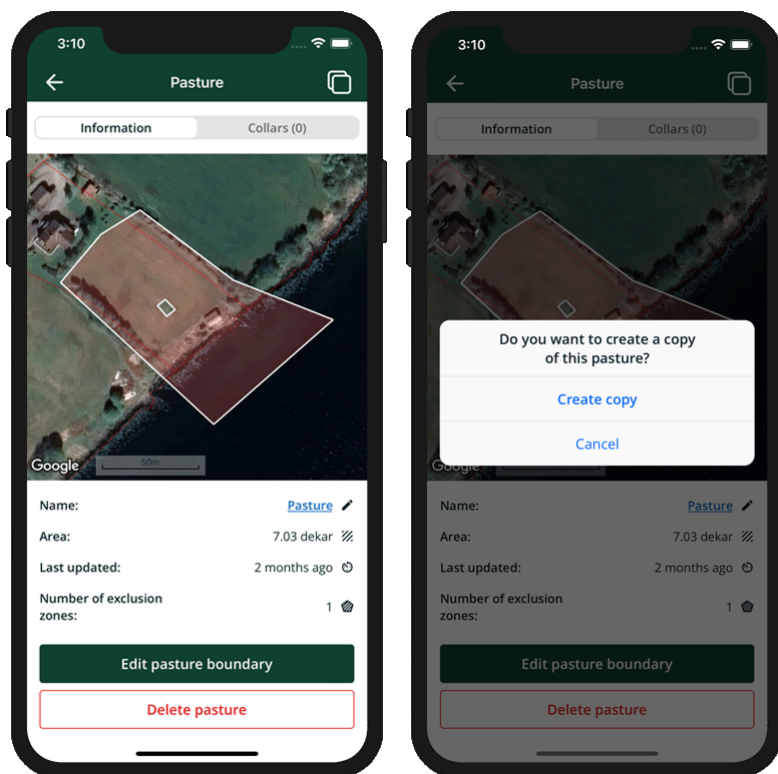
Do you want to change an exclusion zone? Go to the pasture that you want to edit, chose “Edit pasture boundary” and press on the exclusion zone symbol again. Opt for “Edit exclusion zone” and then press on the exclusion zone you want to change.

To delete an exclusion zone, choose “Delete exclusion zone” and then press on the exclusion zone you want to delete. \*Remember to press Save again in order to keep the changes you have made.



### Copy pasture

You can also copy your pastures. Go to your pastures and click on the pasture you want to copy. Then press on the square on the top right corner and make a copy. The copy will then be added to your list of pastures.



### Map, satellite photo, or aerial photo?



In the upper right corner, you can select which type of map you would like to view in the app by clicking on the white circle with the map layer symbol. There can be quite a difference between the standard map, and the satellite map, as the satellite map can deviate from reality. For greater accuracy, using the aerial photo option may be best.

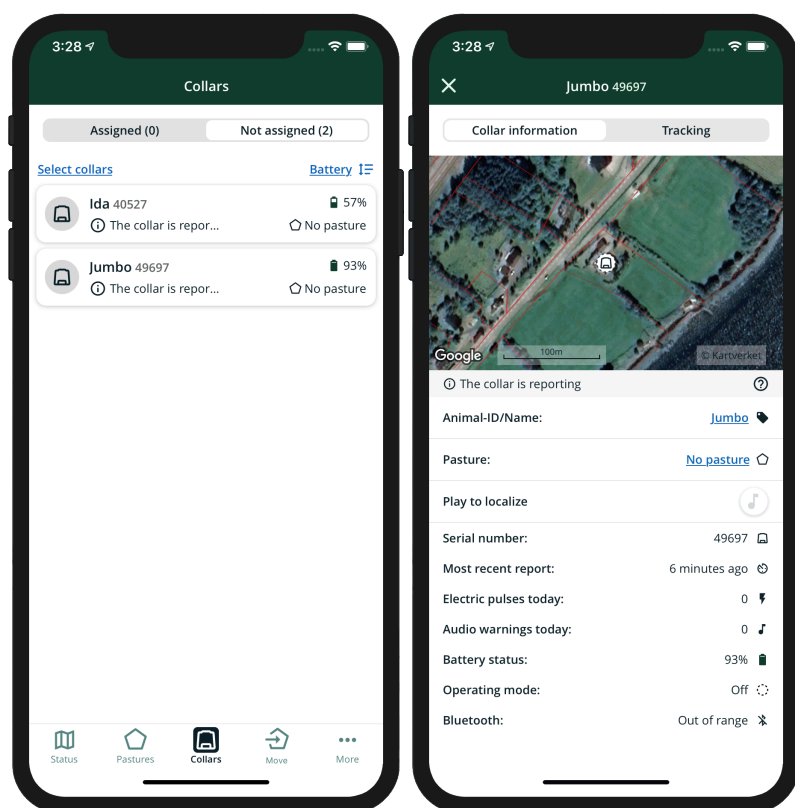
**Pasture analysis**

From the Pasture screen, select the pasture you want to see more information about. Press on the Analysis button on the top right and choose between today's data, data from yesterday or last week. You can get data on positions, electrical pulses, and escapes as a heat map view.

## 4.4. Collars

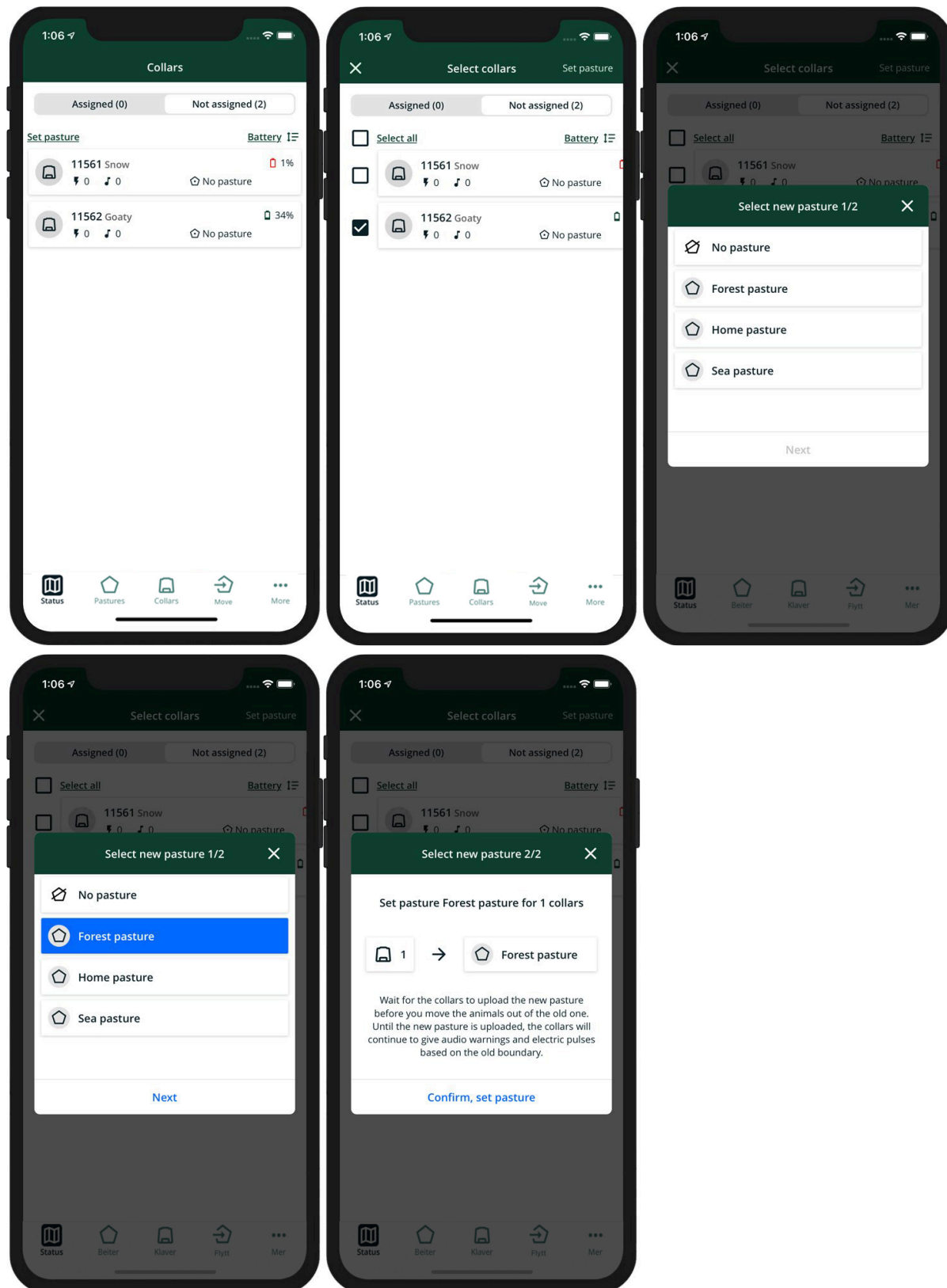
### Collars

Click on “Collars” in the bottom menu to view the list of all your collars. The first time you enter the app, you may need to assign the collars to your user if this has not been done already. Find more information on this matter further down in this section. All collars will appear under the tab “Not assigned”. To give a collar an animal ID or name, click on the collar and then “Add ID/Name”. That way, it will be easier to locate each animal in the map later.



### Assign the collars to a pasture

Even though the app has a button for moving collars, you can also assign the collars to a pasture via the collar list. Click on Select collars and select the ones you want to move. Click on Select all if you are moving all collars at once. Then click Move collars in the bottom right corner, and select the pasture you want to assign them to.



The app will inform you when the collars are loaded to the pasture. When the pasture has been successfully loaded, you will be alerted that it is safe to move the collars into the pasture. If the app fails to contact one or more of the collars, the app will say “Problem loading pasture”. For more information on this matter, please see the section [Troubleshooting](#).

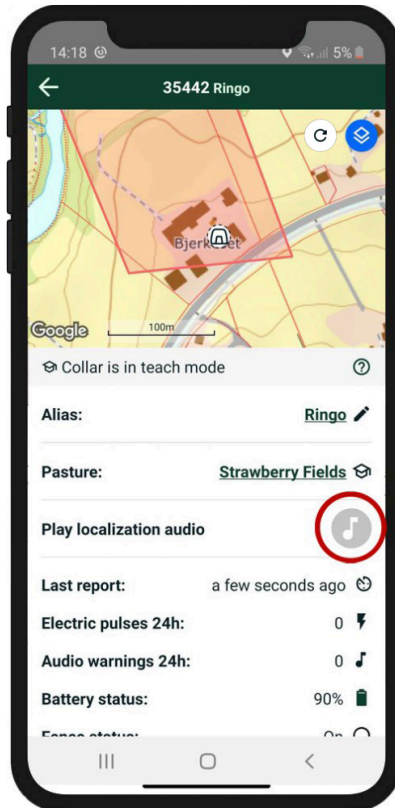
Now all is ready, and you can move animals into their new pasture. As soon as the collar has registered a position inside the pasture, the virtual fence will be activated.

### The Bluetooth search function

The Bluetooth search function can be used to find a lost collar. Find the last registered position for the collar in the map, and walk out to this area in the pasture. Open the collar card in the app, find the 'Play to localize' option and click on the tone icon to the right. If the collar is able to connect to the phone via Bluetooth, it will start playing a tune. Click [here](https://www.youtube.com/embed/GLOJpX1YONQ?rel=0) to listen to the localization melody.



<https://www.youtube.com/embed/GLOJpX1YONQ?rel=0>



Please note that you have to give the phone access to your position for this function to actually work.

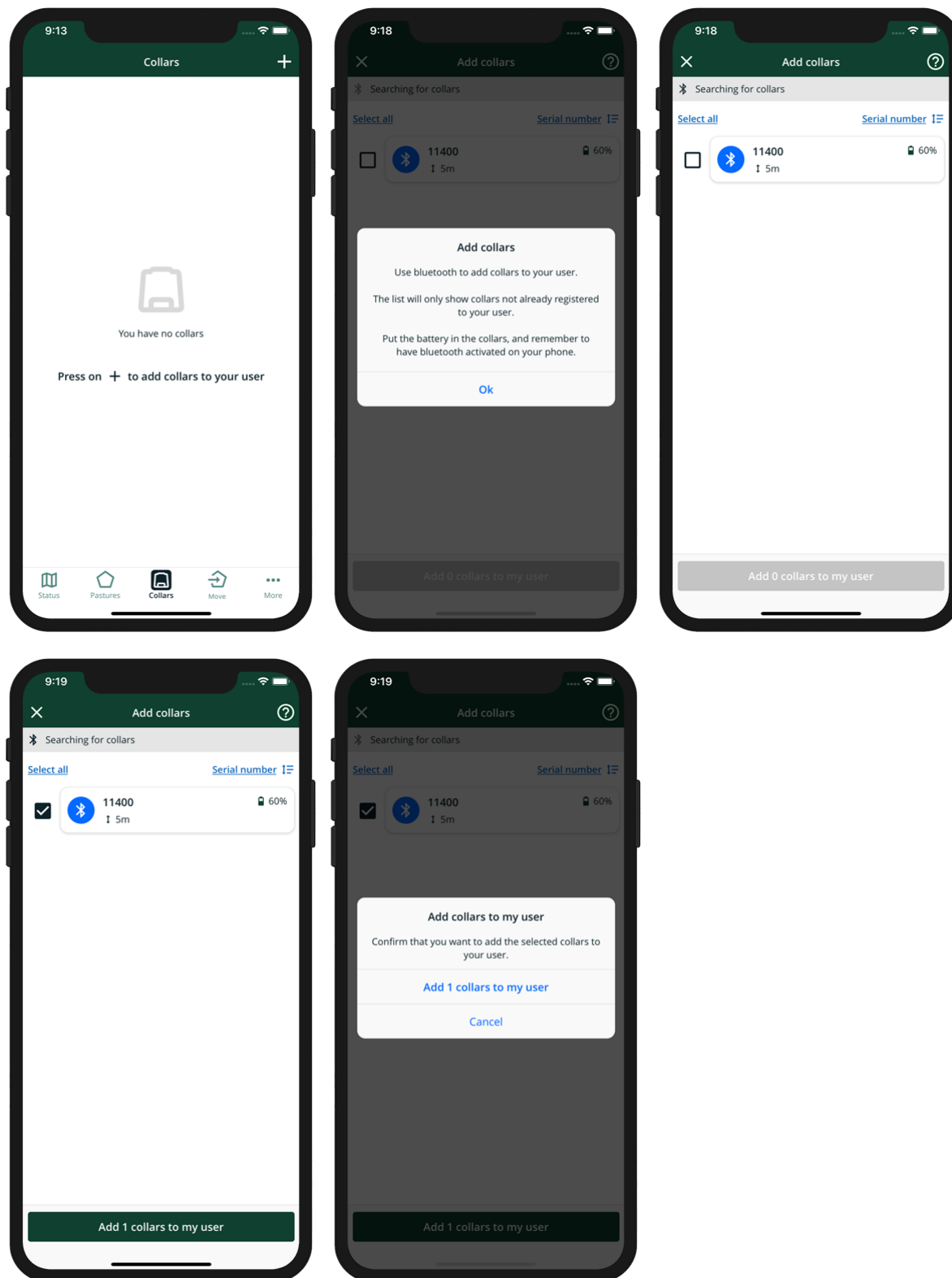


The search function should not be used as long as an animal is wearing the collar, as it may confuse the animal.

### Adding collars to your user

This functionality uses Bluetooth technology, so make sure to switch on Bluetooth on your phone and insert a battery into each collar before you start.

Go to Collars in the main menu to view the collar list. Press the plus icon in the upper right corner to add the new collars to your user. All collars with Bluetooth contact will appear on the list. Select the one(s) you want to add to your user and confirm your choice.



The collars that appear on the list are all collars with Bluetooth contact. However, you will not be able to add collars that already have an owner. If you attempt to add a collar assigned to another user, an error message will appear. If so, please contact Nofence support.

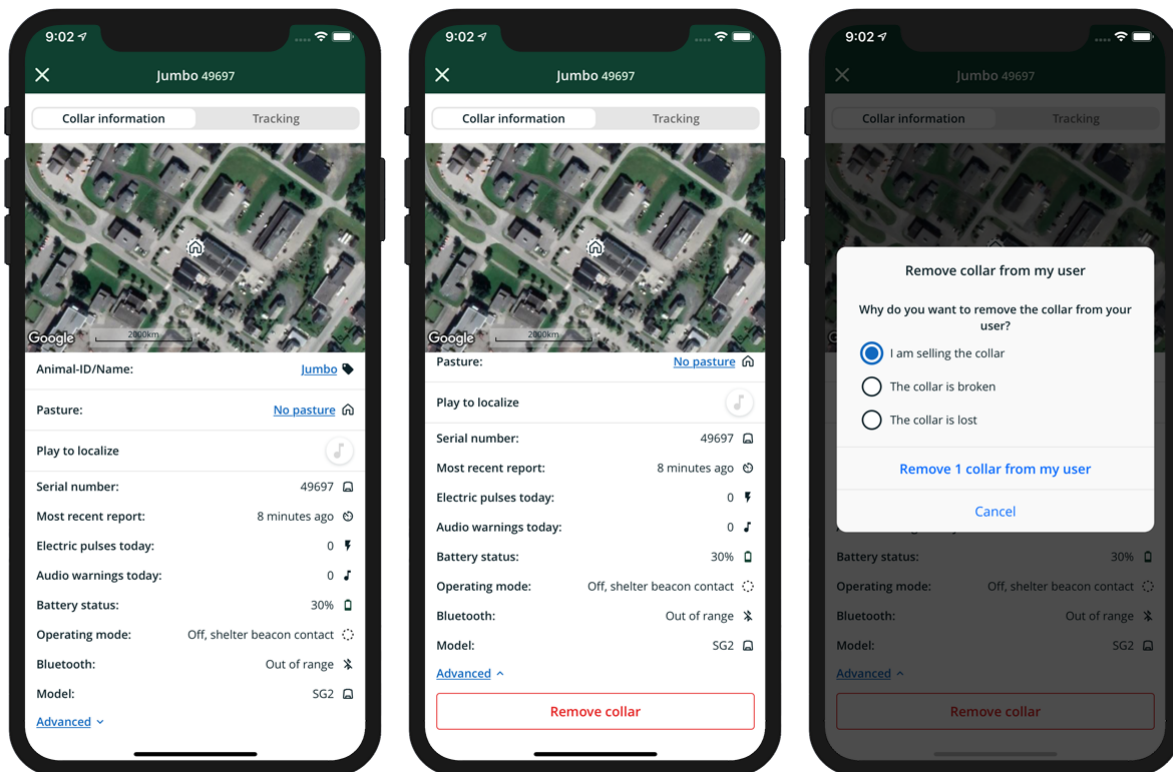
### Removing collars from your user

To remove a collar from your user, click on Collars in the main menu. You are only able to remove collars without an active pasture, so make sure the collar you want to remove is found in the Not

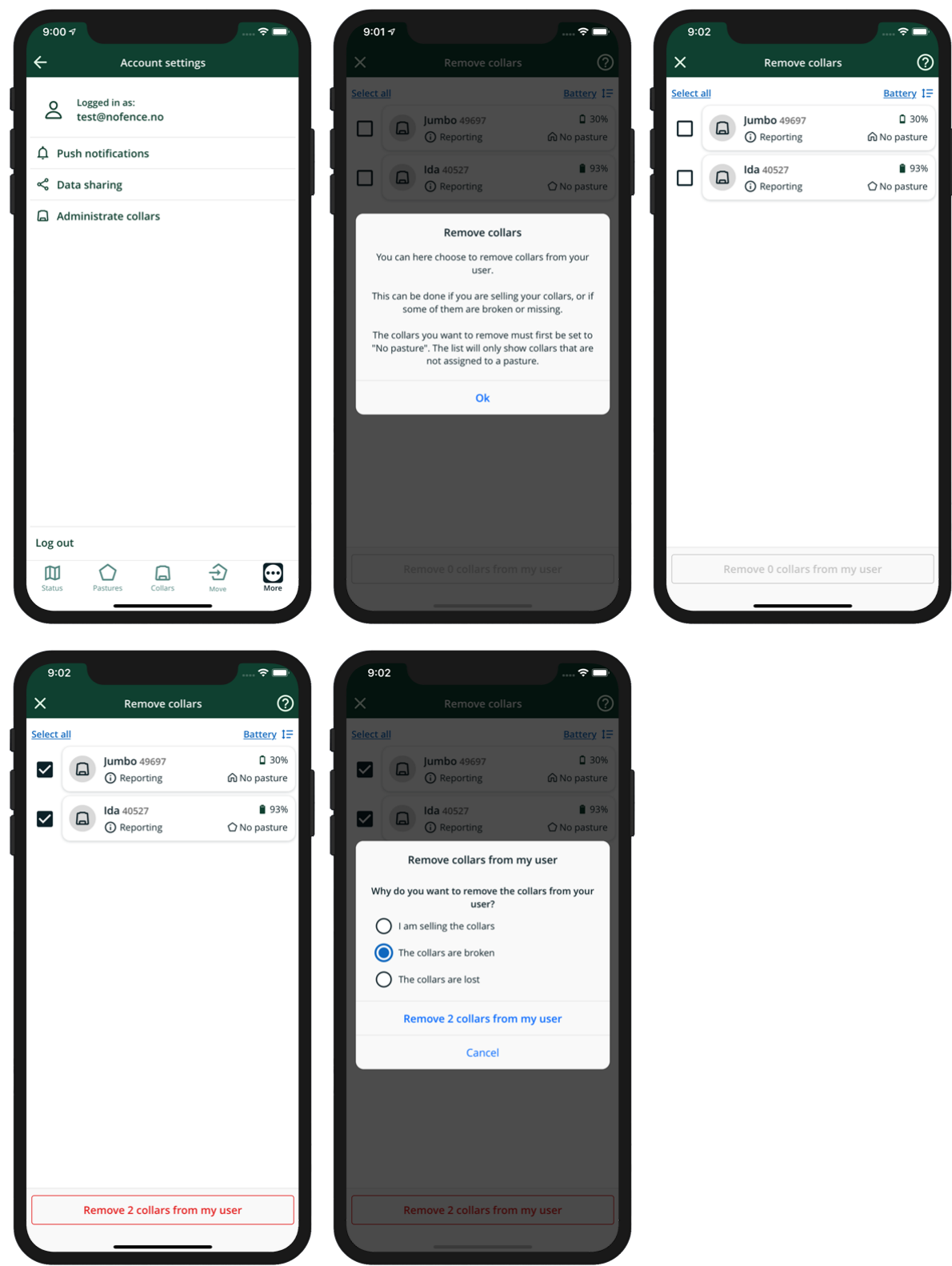


assigned list.

Select the collar you want to remove and scroll down to press the Advanced button at the bottom of the screen. Select Remove collar and submit the reason for the removal. Confirm to remove the collar from your user.



To remove several collars at the same time, select More from the main menu, press My user, then Collar administration. Select the collars you want to remove. Click Remove collars and submit the reason for the removal. Press Confirm to remove the collars from your user. It is only possible to remove your own collars from your own user. Please note that anyone with access to your app also can perform this operation.

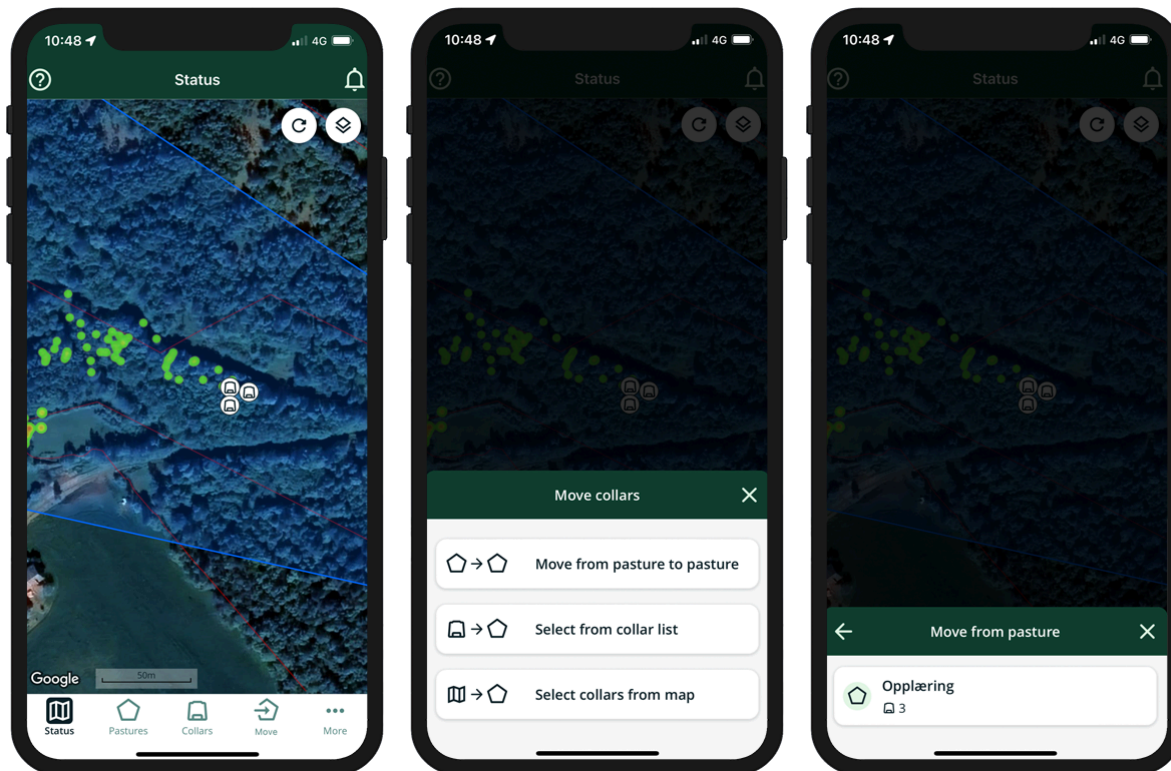


✿ Note that changes in the total number of collars may affect your price plan.

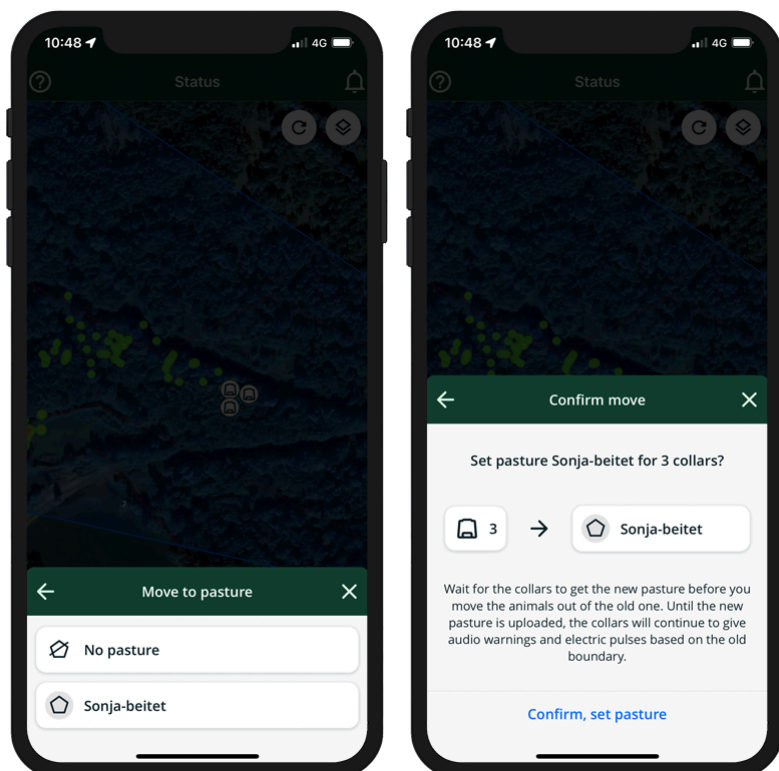
## 4.5. Move

### Move collars from pasture to pasture

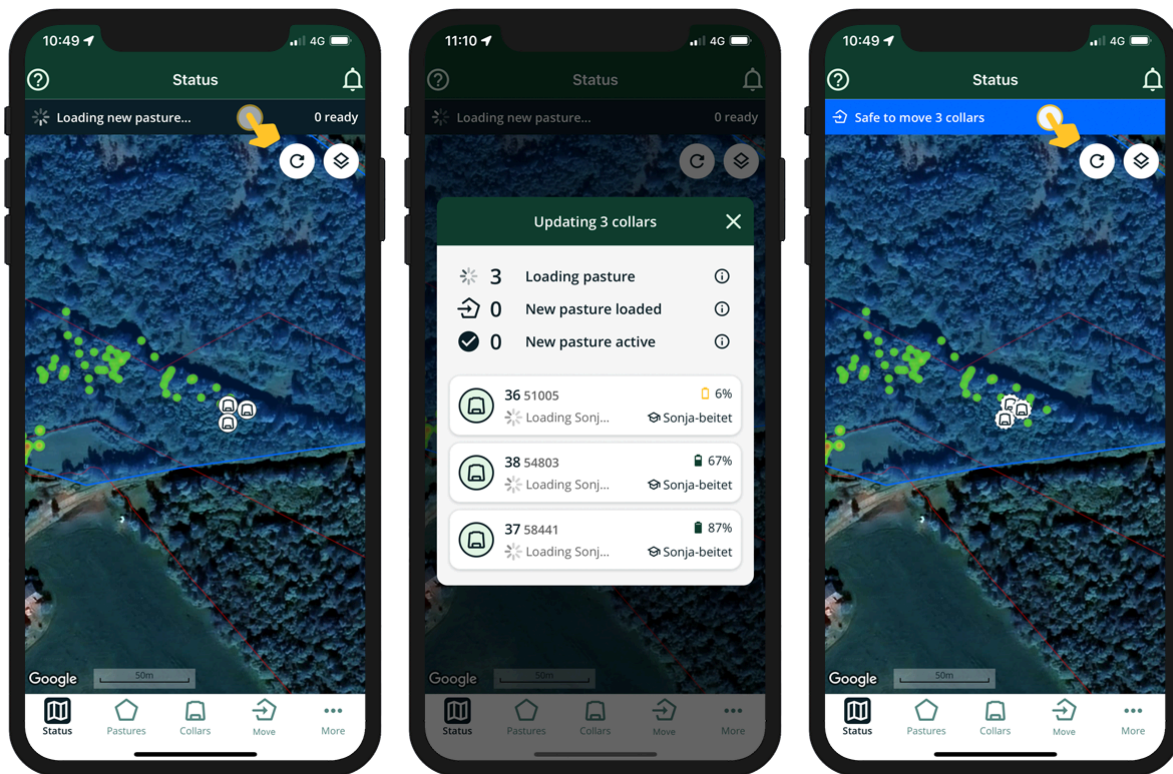
If you wish to move the animals from one pasture to another, click on Move and then Move from pasture to pasture. Select the pasture you want to move the animals from.



Then, select the pasture you want to move the animals to. Click on Confirm, set pasture.



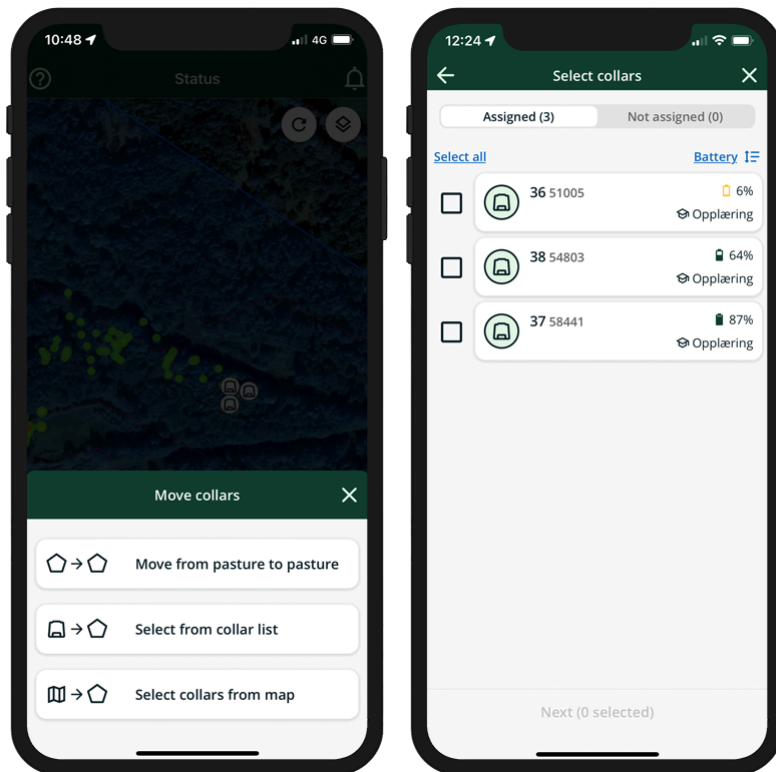
Now, the collars will upload the new pasture they have been assigned to. You can track the process by clicking on the status line on the top of the screen. The info box will appear and let you know if the collars are loading, if they succeed or fail to load, and if the collars have been registered inside their new pasture. The virtual fence will be activated as soon as a collar has registered a position inside the new pasture.



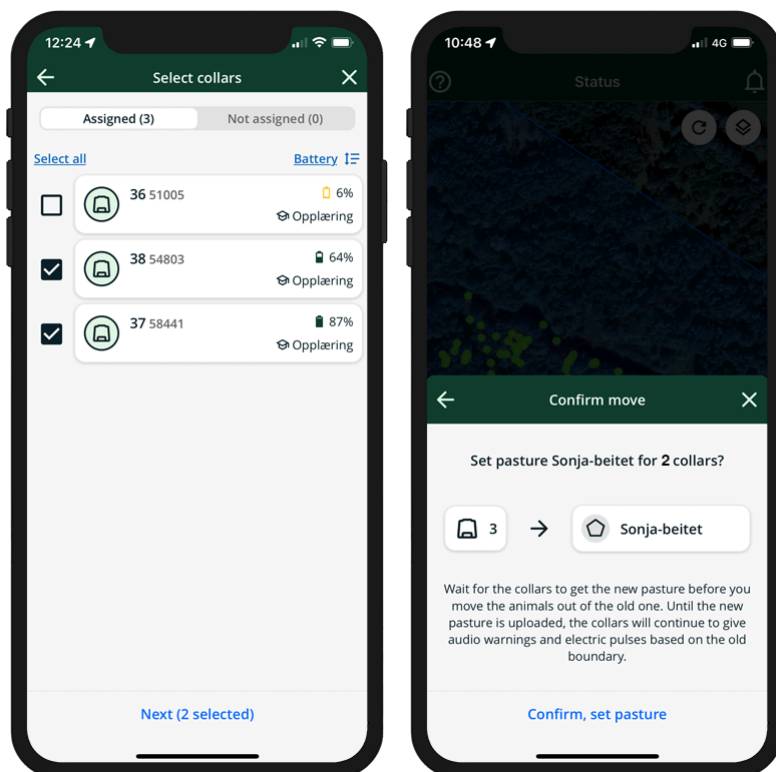
! Please note that small changes to the current pasture boundaries will also trigger the status line at the top of the screen. Use this to ensure that all your animals have the same pasture boundary.

### Select one, multiple or all collars from the collar list

If you wish to move one collar at a time, or multiple collars, choose the option Select from collar list. The collar list will appear, and you can select collars both with and without an existing pasture.



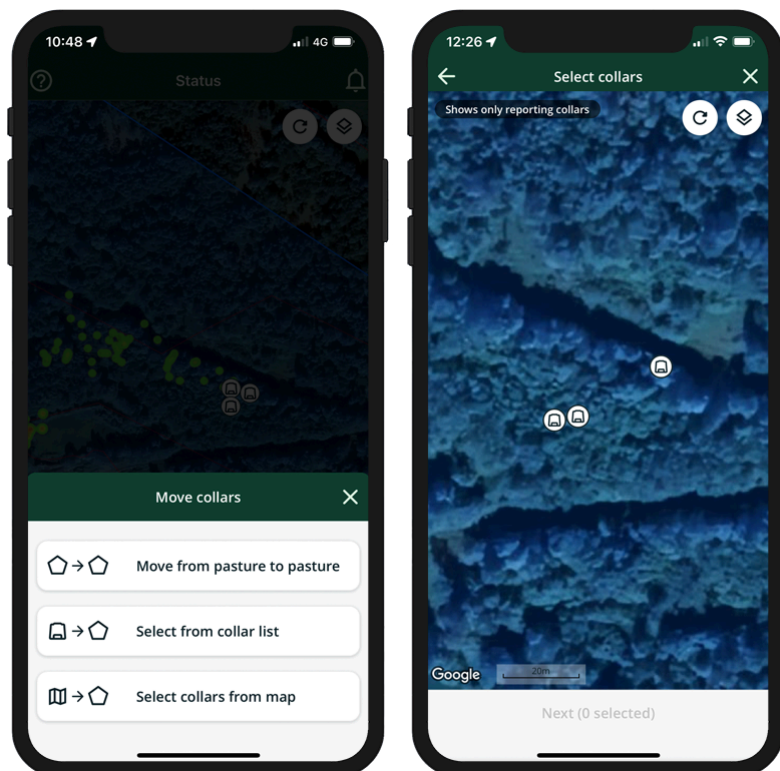
Select the collars you want to move, and click Next on the bottom of the screen. The list of your different pastures will then appear. Select the pasture you want to move the collars to. Then click Confirm. Once you do this, the status banner appears where you can track the process.



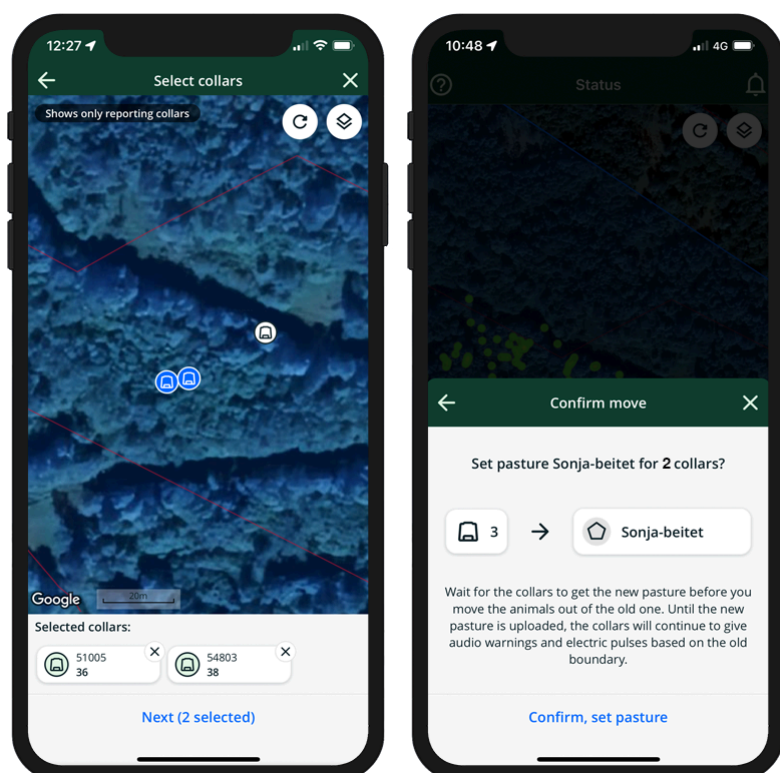
### Select collars from map

If you wish to move collars from the map, select the option Select collars from map. The map will then appear, and you can click on the collars in the map that you would like to move to a new pasture.

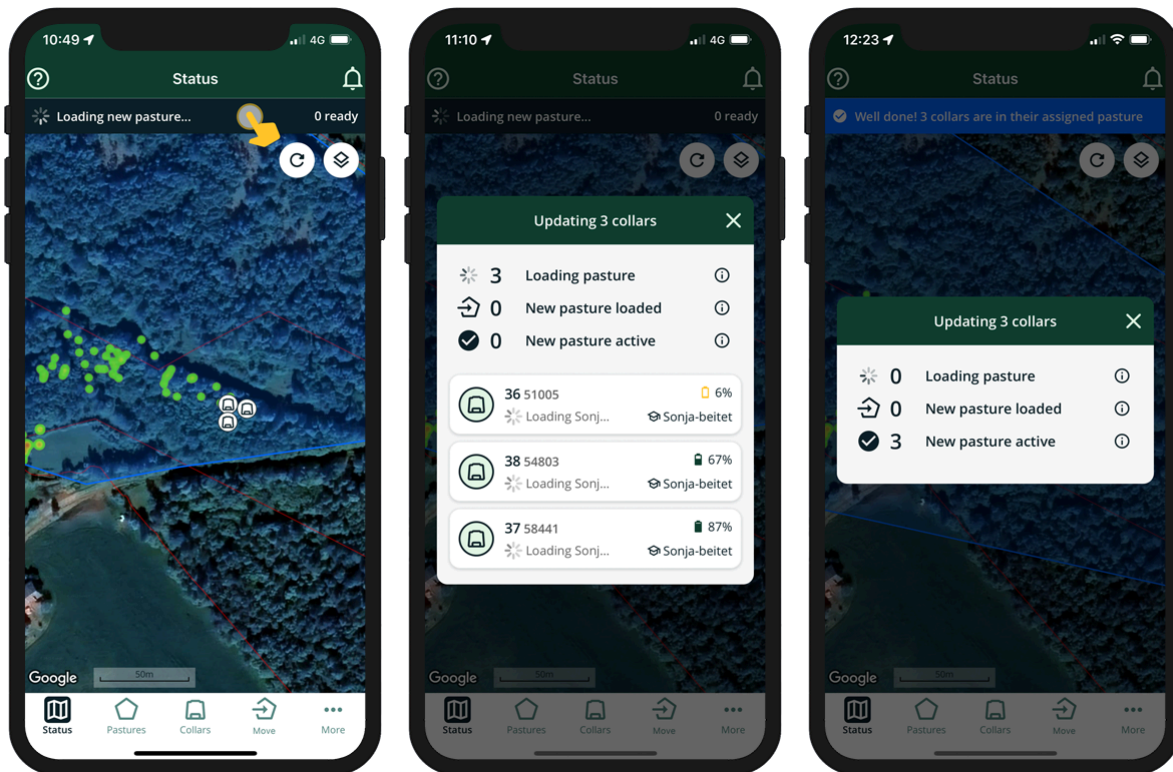




Once you have selected the collars you want to move, click Next. Select the new pasture, and click Confirm. The collars will now load their new pasture.

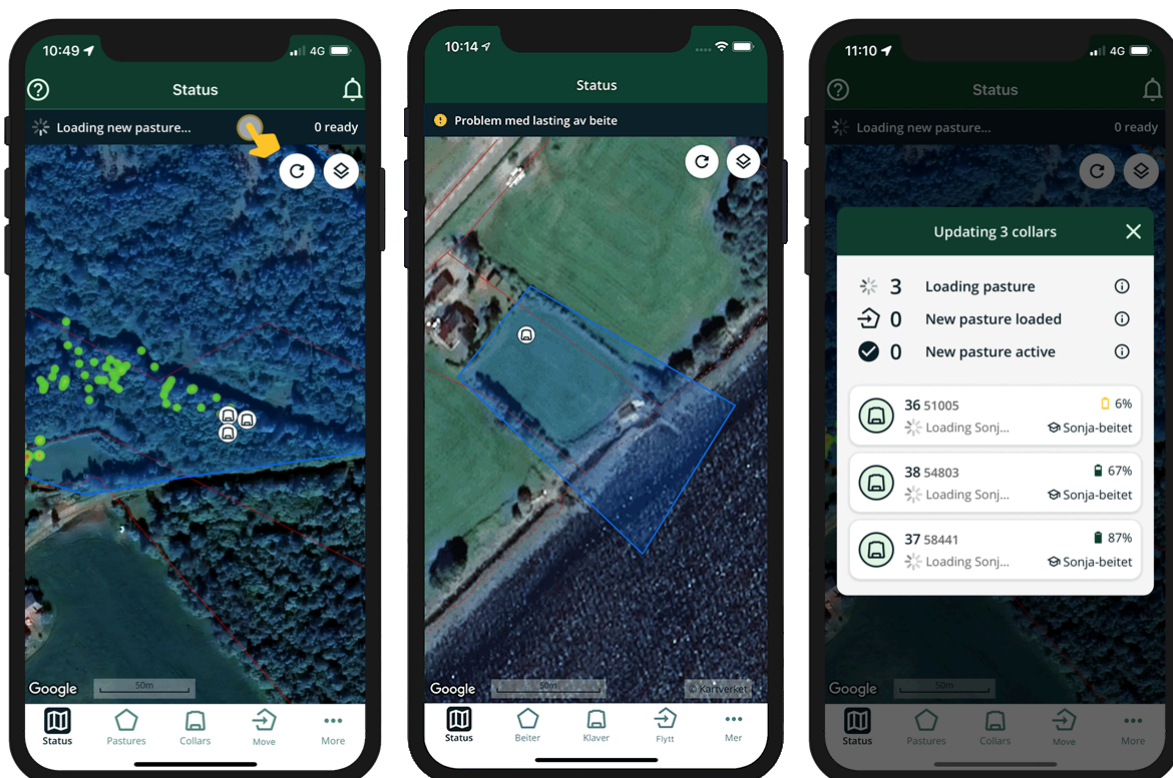


The status banner will tell you if the collars upload their new pasture successfully or not. Click on this for more information. See what a successful move looks like below:



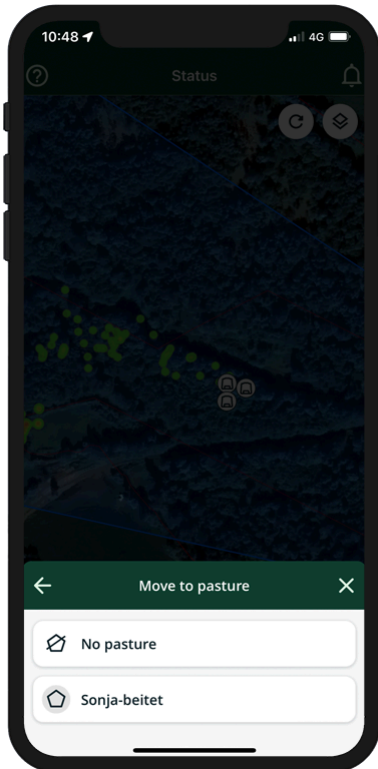
When the Nofence pasture is finished loading, you will be alerted that it is safe to move the collars to their new pasture. Then, you can bring your animals to the pasture. The virtual fence is activated as soon as a collar has registered a position inside the new pasture. If you now click on the status banner, you can see that the collar is registered in the pasture.

If the collars fail to receive the information about their new pasture (which can be caused by poor mobile coverage or an empty battery), the status banner will alert you about this. Below you can see what this might look like:



### Remove the animals from the pasture/Switch off the pasture

When you are removing the animals from the pasture, and want to switch off the virtual fence, you can follow the same procedure as when moving the animals to a new pasture. Select collars as described above, but select the option No pasture. Proceed the same way as you would if you were moving them to a new pasture. The virtual fence will be switched off as soon as the collar has loaded the information successfully, and the animals can then be moved safely.



Please note that if you are in an area without sufficient mobile coverage, uploading a new pasture can be a challenge. Your mobile phone and the collars must have coverage to ensure that the collars receive the information from the app. For cases where you do not have mobile coverage, you can use the function Remove pasture over Bluetooth: `#remove-pasture-over-bluetooth` to switch off the virtual fence.

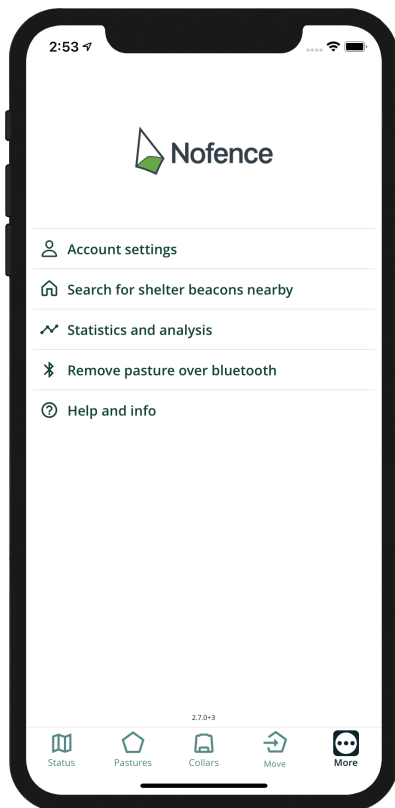


If you are removing the collars at the end of the season, we recommend removing the batteries and performing maintenance: `#maintenance-and-storage`. If you are on the Variable Price Plan, the daily usage costs will not be charged as soon as the battery is removed.

## 4.6. More

### More

The last menu option is More, where you find Account settings, the shelter beacon search function, Statistics and analysis, a function for switching a pasture off via Bluetooth and finally; Help and info.



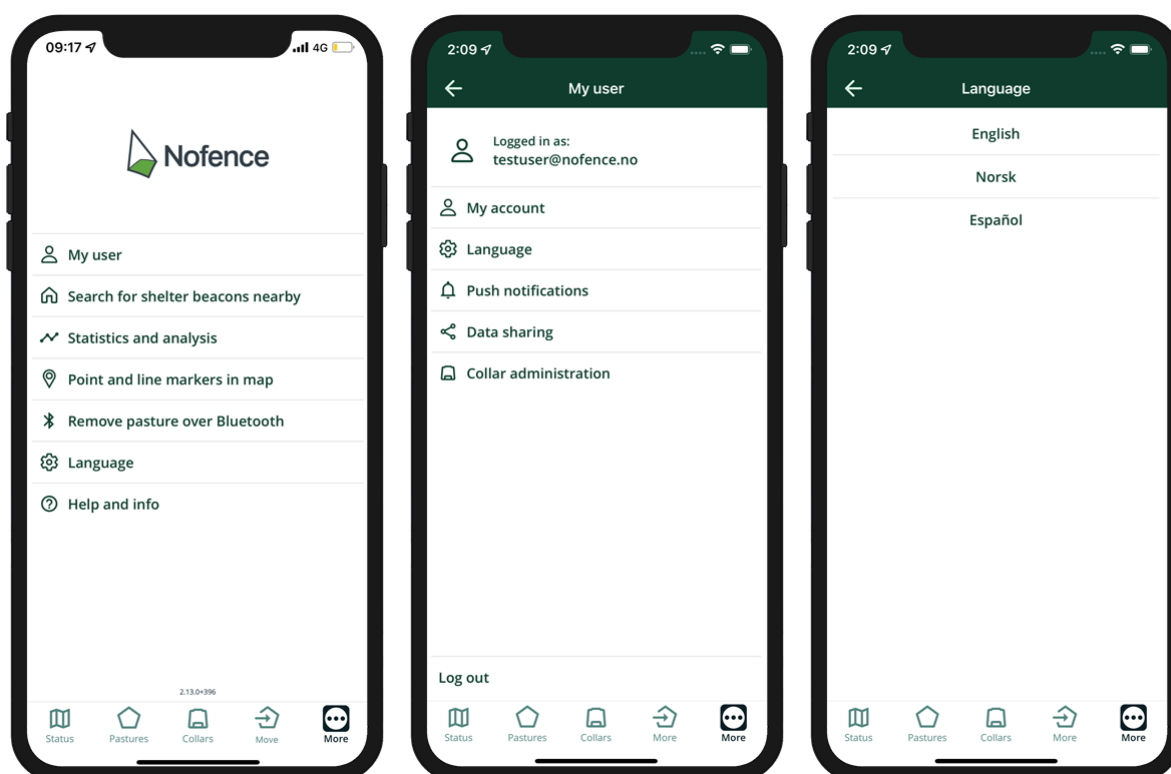
If you press on the question mark icons found in various places in the app you will find relevant info about the present app options.

## 4.6.1. My user

Under the menu option “More” you will find “My user”. Here you can access your account page and change your preferences for push notifications. You will also find settings for sharing location data in Nofence’s official grazing map and can remove collars from your user. This is also where you log out of the app.

### Language

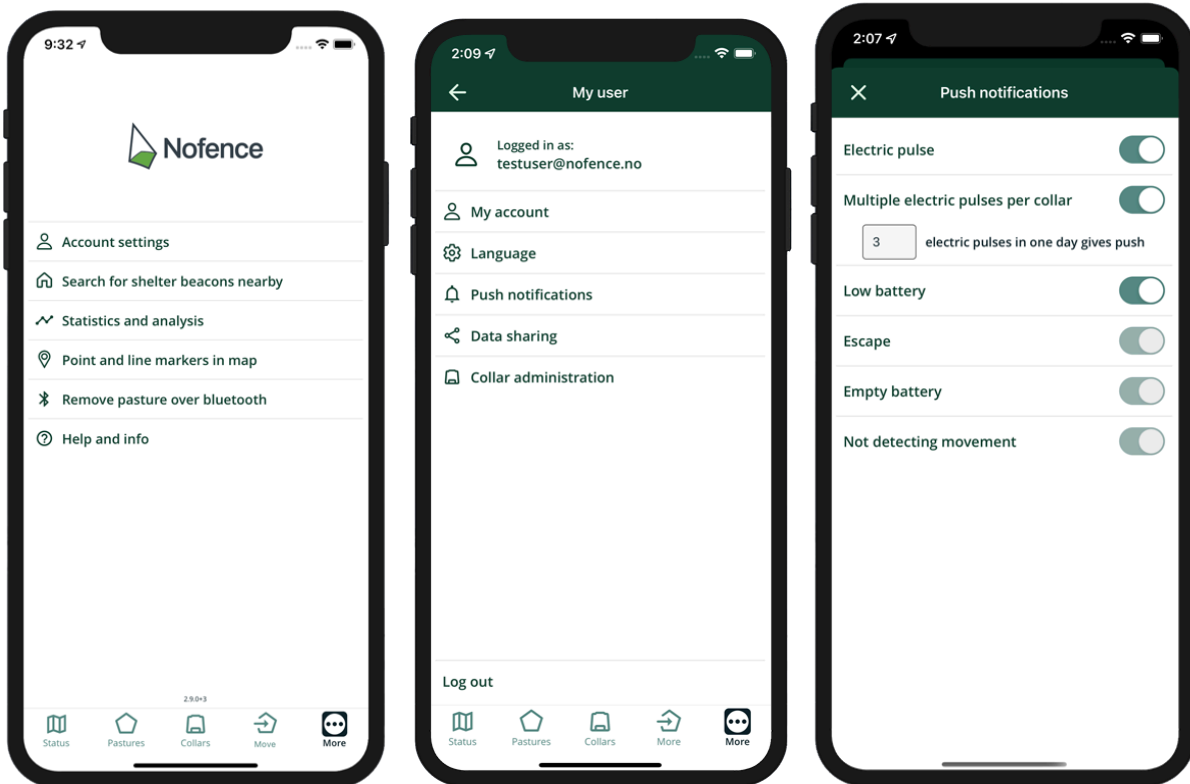
You can select your preferred language in the app. You can choose between English, Norwegian and Spanish.



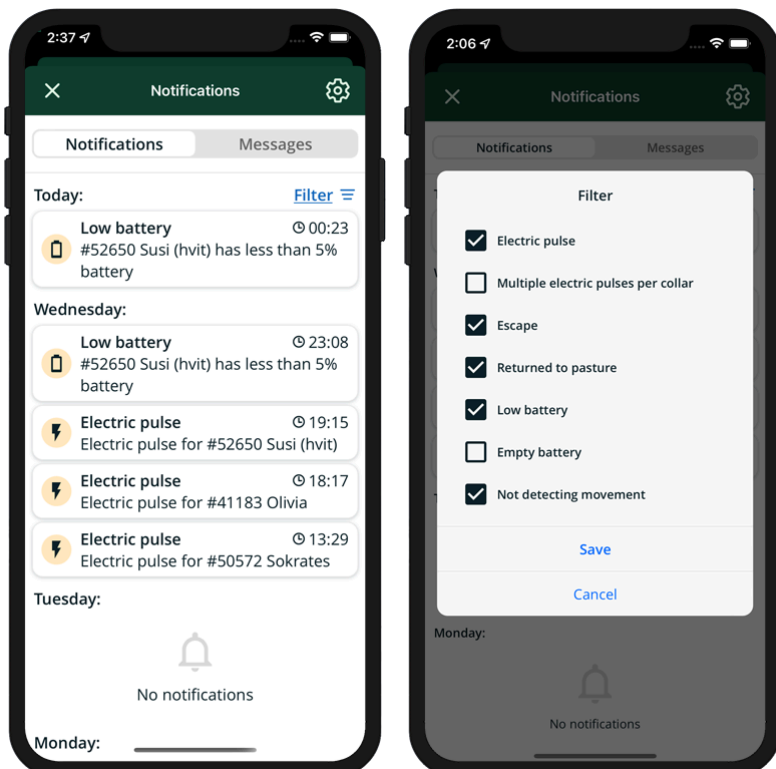
### Push notifications

Options for push notifications for electric pulses and low battery. It is not possible to turn off the push notifications for escape, empty battery or inactivity. The latter could be an indication of disease or injury and should be followed up by the farmer.





In the notification center, you will receive messages on all notifications, but you are able to filter out what messages you want to see.

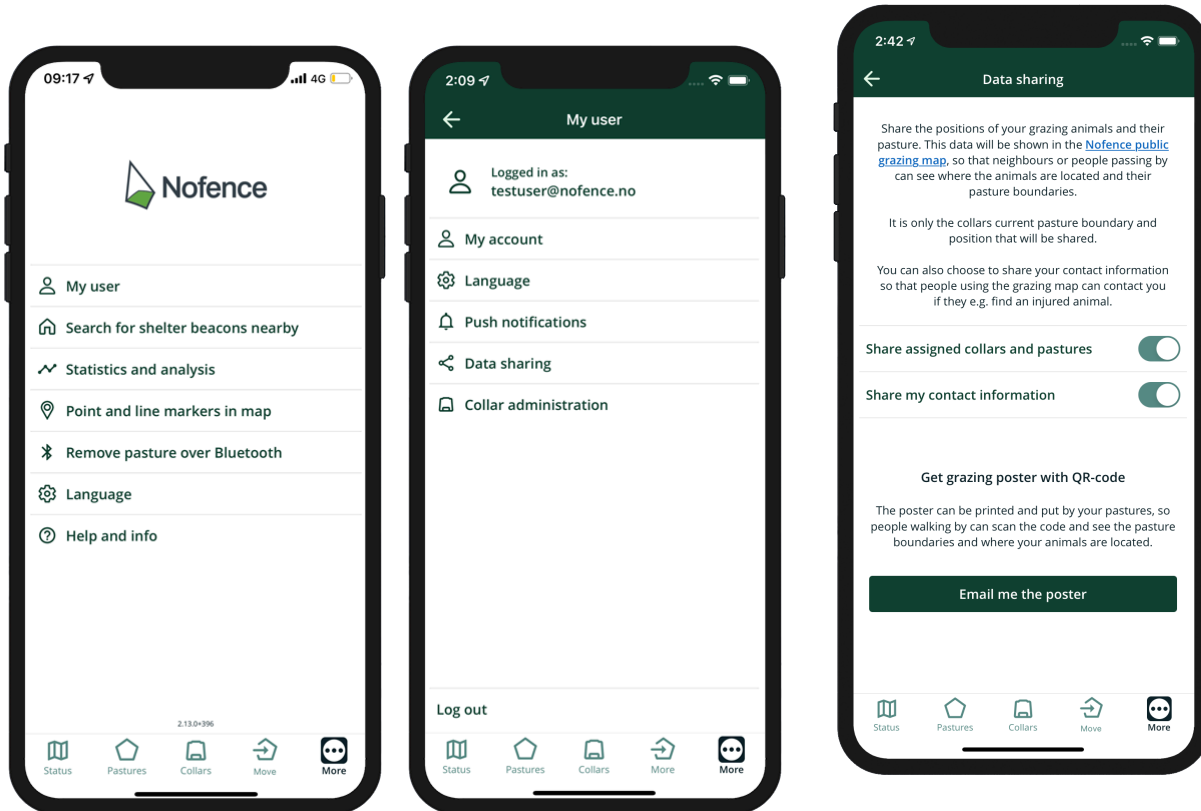


### Sharing of data to Nofence's official Grazing map

Nofence's official Grazing map is a service that allows the farmer to share the animals' most current positions as well as their current grazing boundary with the public. Many animals graze on grounds where members of the public are passing through, and making the animals' positions and pasture boundaries available through the Grazing map could be of great benefit to the farmer. You are also able

to share your contact info (name and email address) in the map, allowing members of the public to contact you in case they notice a sick or injured animal.

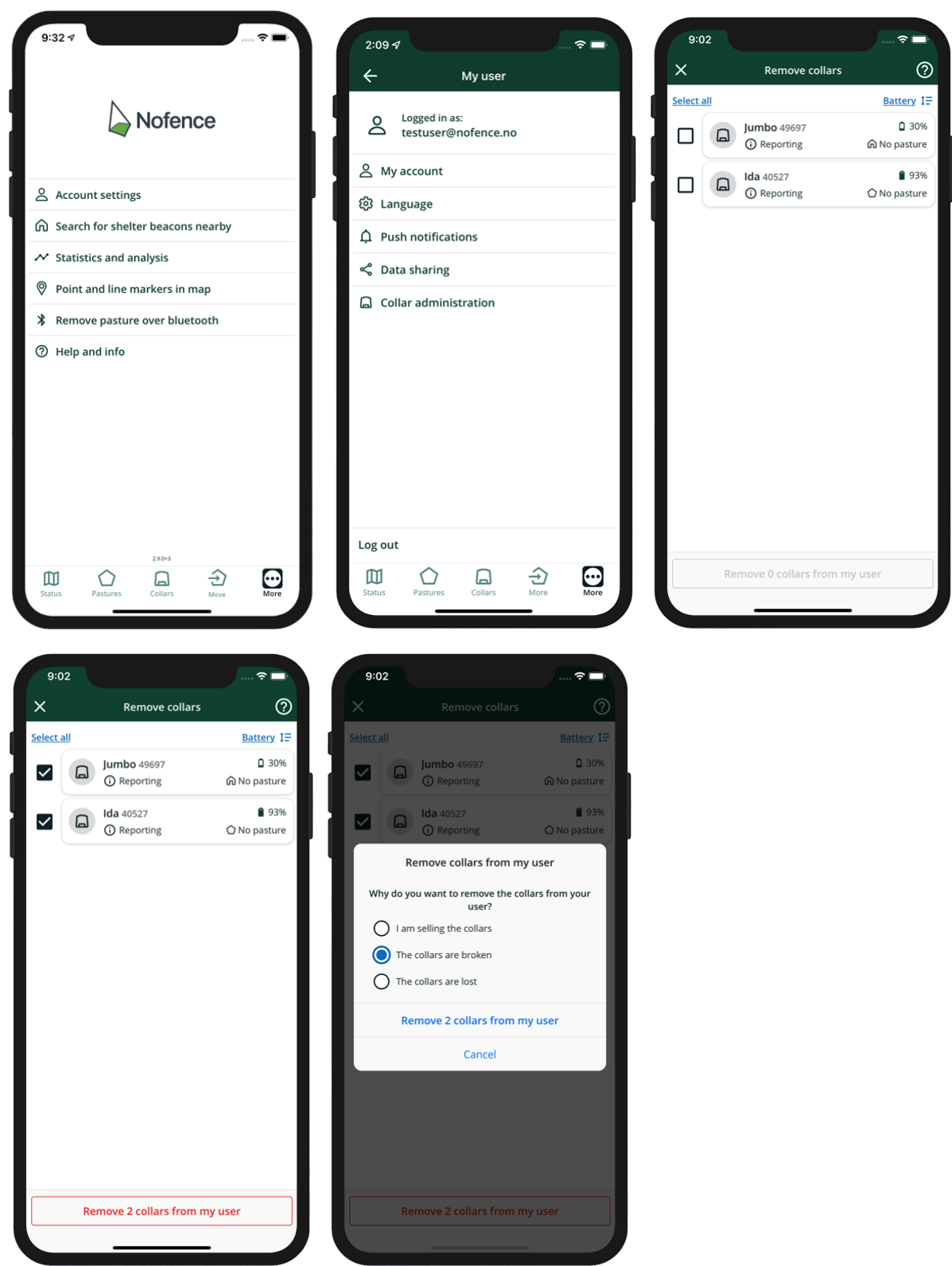
Under this section you also find grazing posters with QR codes. The codes direct to the Grazing map and the posters further inform of animals grazing in the area using Nofence collars, as well as encourage people to keep their dogs on a leash around the animals.



### Administratre collars

To remove several collars from your account at the same time, select More from the main menu, then press Account settings and Administrate collars. Tick the boxes next to the collars you want to remove or press on the Select all box at the top of the list. Select Remove collars and submit the reason for the removal. Confirm to remove the collars from your user.

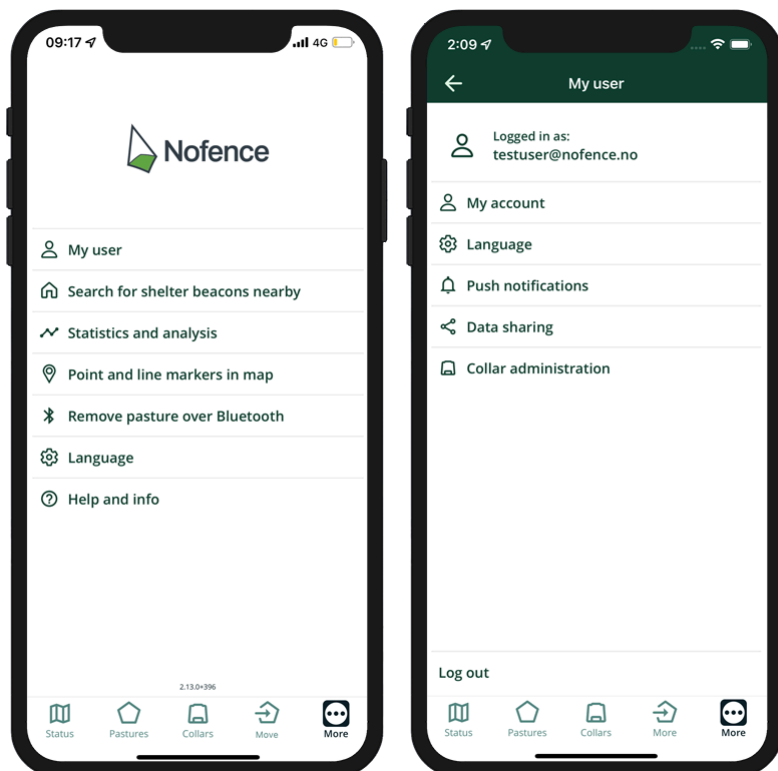
You are only able to remove collars from your own user. Remember that anyone who has access to your app also can perform this operation.



Please note that changes in the number of collars may affect your price plan.

## 4.6.2. My account

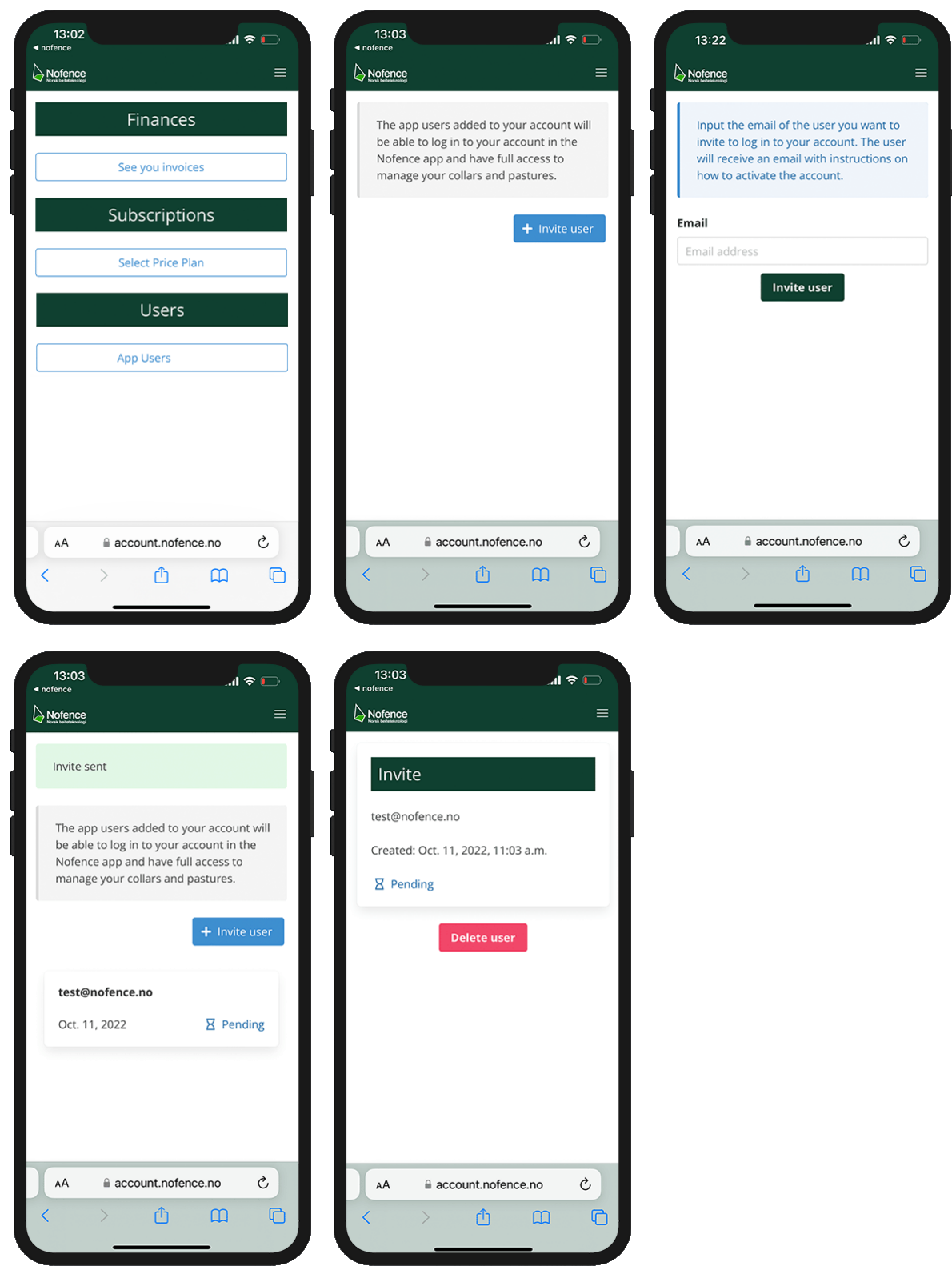
Under my user you will find your account page, where you can find more info about your account.



You can give other people access to your user in the Nofence app, but with their own log in so you don't have to share your password. The guest user will have full access to your app, but they will not have access to your account details as invoices etc. However it is important to remember that the guest user will receive the same push notifications/ messages as yourself in the app.

To invite a guest user you go through the app to more – my user – my account – app users. Type in their email and send the invite. The email you send the invitation to must be unique and can not be registered on an existing user. The invited guest user will then receive an activation email with a link to create an username and password. When that is done they will be able to log in to the app, and their status will change from pending to active.

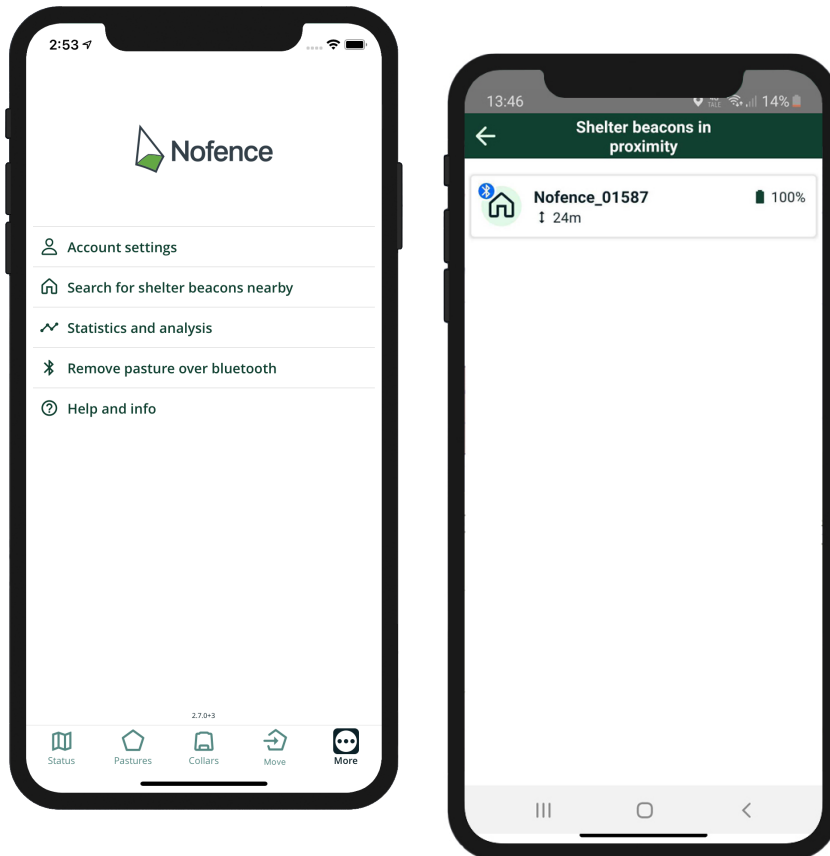
You can manage your guest users from your account, and invite or delete guest users as you like. If you delete a guest user they will receive an email explaining that they will no longer be able to use the app.





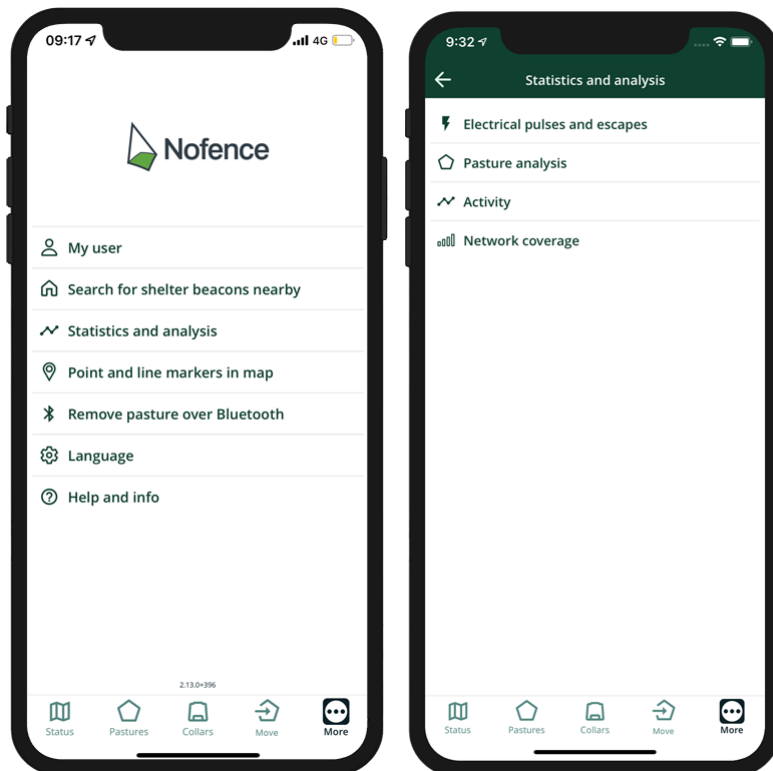
## 4.6.3. Search for Shelter Beacons nearby

Are you wondering about the battery capacity of your indoor beacons, or forgot where you left them last? You can find this information via the menu option “More” at the bottom of the screen. Then go to “Search for shelter beacon nearby”. A list of all nearby shelter beacons will appear and a distance guide will help you find out how far away you are from the shelter beacon box.



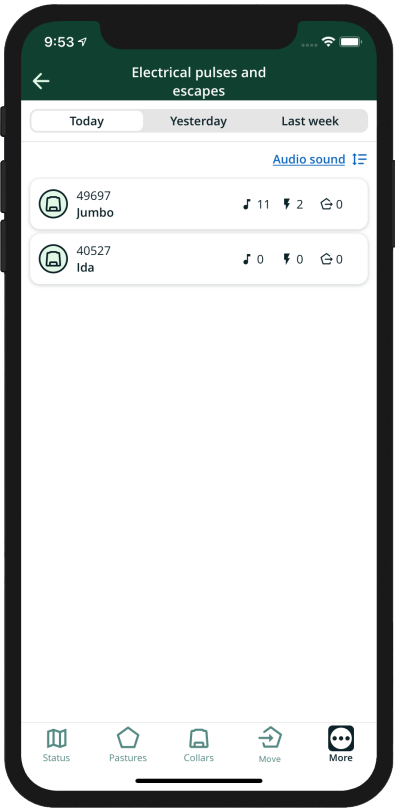
## 4.6.4. Statistics and analysis

Use the Statistics and analysis option to have a closer look at Electrical pulses and escapes, Pasture analysis, Activity and Network coverage.



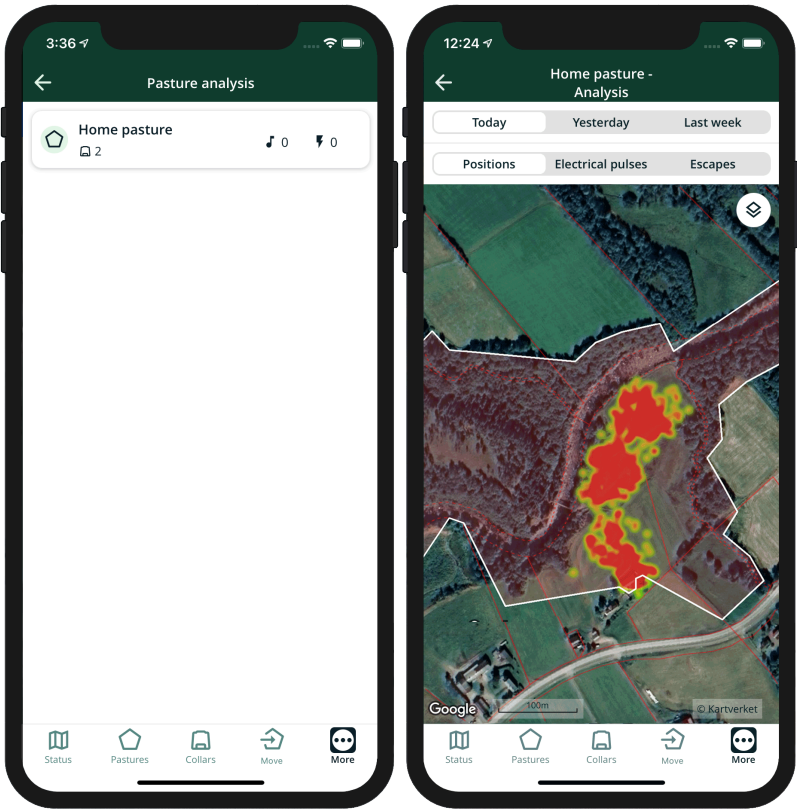
### Electrical pulses and escapes

In this section, you will find an overview of audio sounds, electrical pulses and escapes for each collar. You can opt to see data for today's date, yesterday's date or last week. You may also sort the list by audio signals, electrical pulses and escapes. Press on a collar to get more details and tracking info.



**Pasture analysis**

Pasture analysis gives an overview of logged positions, electrical pulses and escapes on pasture level. Sort by today's date, yesterday's date and last week. The data is visualized in a heat map, which can be useful for analysis and optimization of the pasture.



## Activity

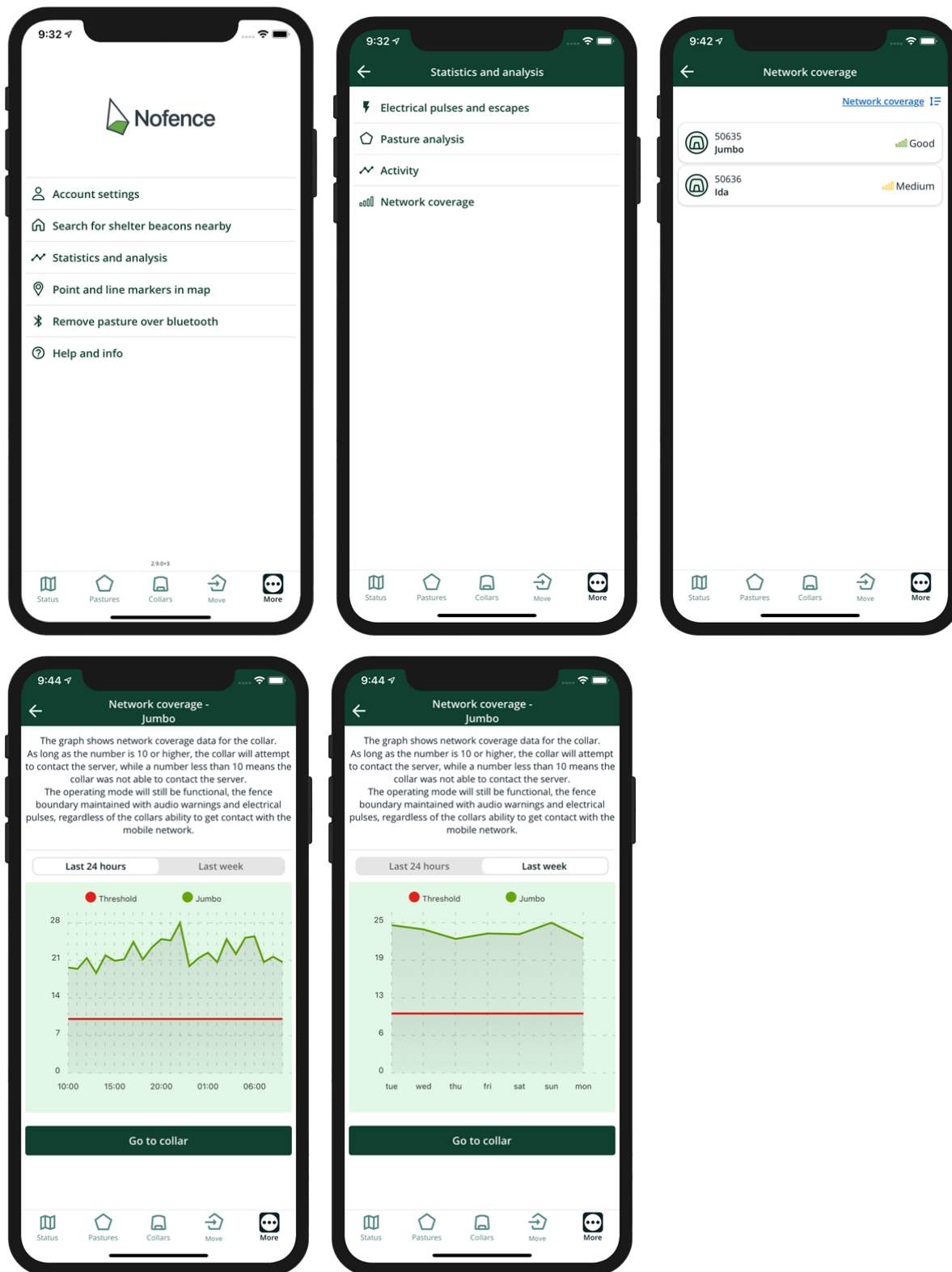
This section provides statistics that show the animals' activity levels. **Sensor data gives you information about the collars activity over the last 24 hours and well as the last week, and compares this with the activity of the other collars in the same pasture during the same time period.** If you notice significant changes in activity, this may be a sign of illness or injury, and the animal should be checked on.



## Mobile network coverage

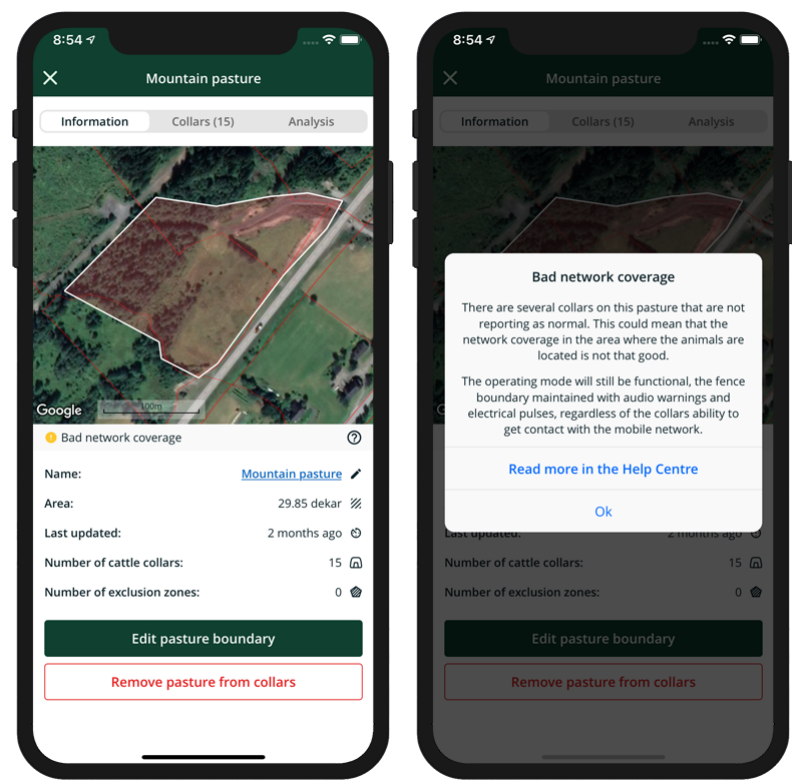
Although it may not be straightforward to know if an area has good or poor mobile coverage, the collar logs data which provides more accurate information about this. Choose Network coverage under the Statistics and analysis section to see if the collar has spent time in an area of poor, medium, or good mobile coverage for the past 24 hours or week.

The red line marks the point where the collar is no longer able to connect to the server via the mobile network (reporting). If the collar is unable to send you information via the mobile network, its icon turns yellow in the app. Note that the collar may very well still have the operating mode intact and will emit audio warnings and electric pulses as per normal even though they are unable to deliver reports. When the collar is back in an area with sufficient mobile coverage, it will start reporting again.



You will also receive information about poor mobile coverage on a pasture level. If the majority of collars in a pasture report having poor mobile network conditions, a pop-up window will notify you of this.

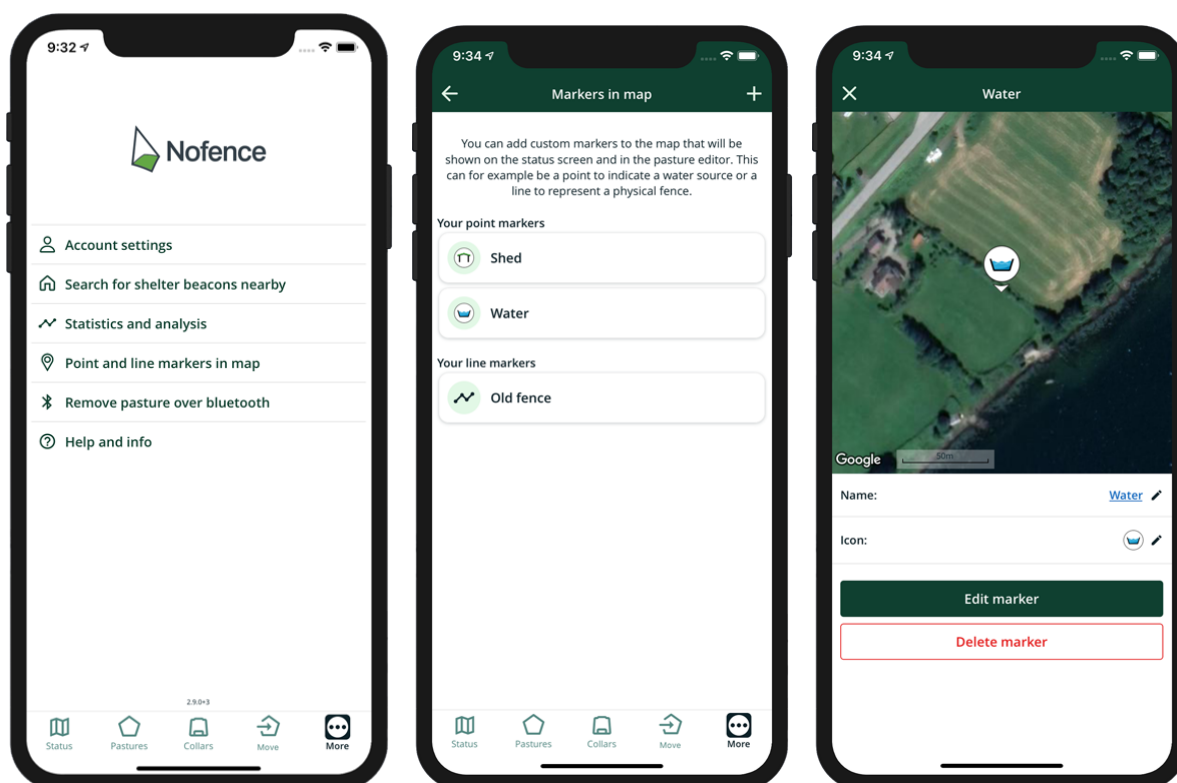


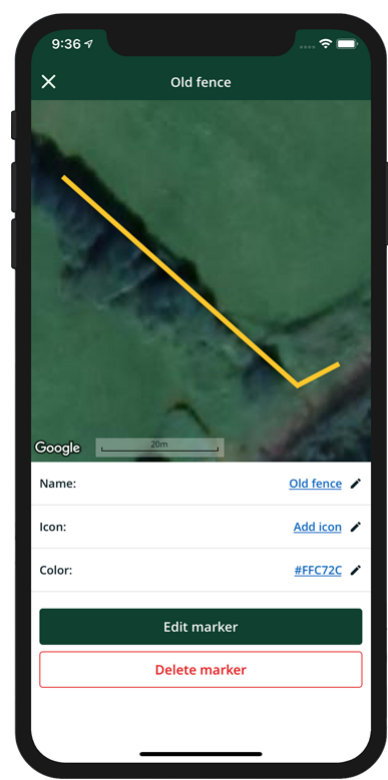


## 4.6.5. Point and line markers in map

If you want to mark the spot where the watering trough or salt block is located in your pasture, use the custom map markers and lines option. The icons will show in the map on the status screen and in the pasture editor.

Go to “More” in the main menu and select “Point and line markers in map”. Then, press the “+” icon on the top right of the screen and choose which marker you want to add. Press on the map to place your marker and save on the top right of the screen. You can select different icons as bullets that illustrate the item you are adding and choose the color of the lines so that they are easy to see. Then tap “Save” at the top right.

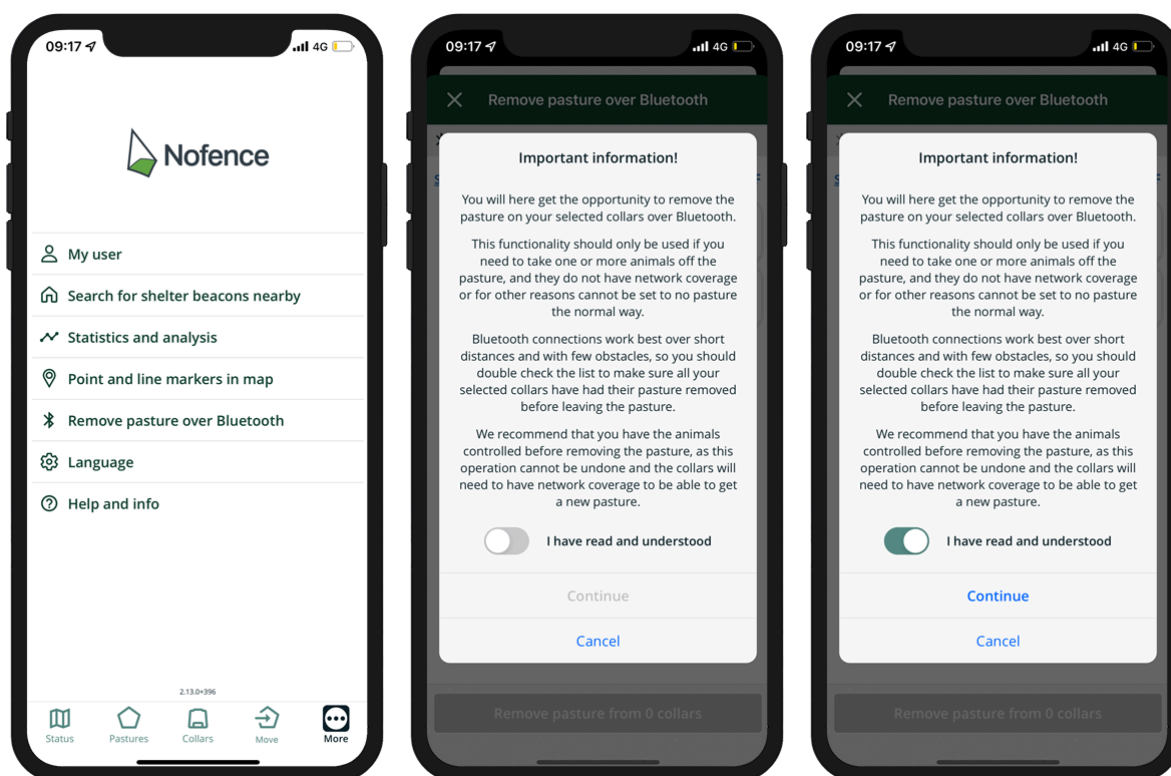


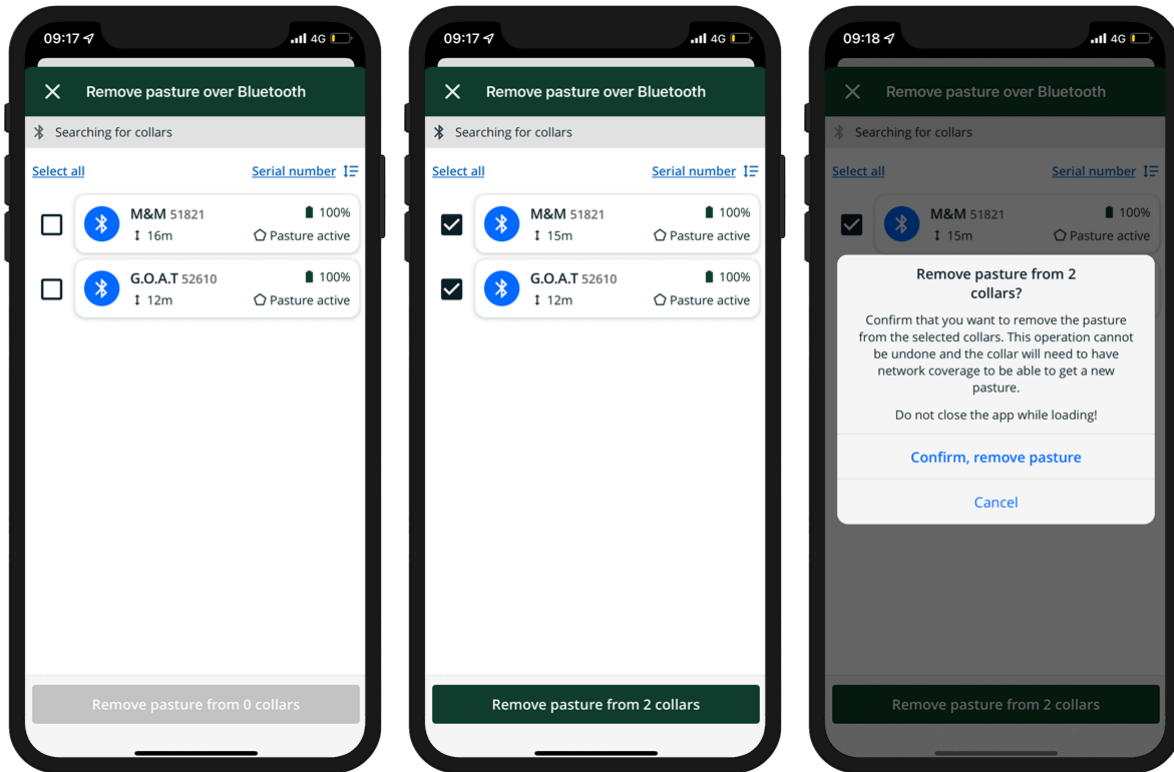


## 4.6.6. Remove pasture via Bluetooth

! Removing the pasture via Bluetooth is an emergency function, and should only be used in cases where you do not have sufficient mobile coverage. Please note that you will not be able to switch the virtual fence back on before both the collars and your phone are within an area with mobile coverage.

By using this function, you will have the option to remove the pasture from the collars via Bluetooth regardless of mobile coverage, for example if you are bringing the animals back home from the mountain pasture.





Contact via Bluetooth works best at short distances, and with minimal obstacles affecting the signal. You should therefore make sure that all collars have switched off the fence successfully, before you start removing the animals from the pasture.

We recommend having control of your animals before you switch off the fence, as this action cannot be undone. The collars will need to have mobile coverage to be able to be assigned to a new pasture.

### How to remove the pasture via Bluetooth



Please note that in areas without mobile coverage, your user data in the app will not be visible. However, you will still be able to open the app and remove the collars via Bluetooth.

1. Open the app and go to More
2. Click Remove pasture over Bluetooth
3. Read Important information, and tick the box to confirm that you have read and understood. Then click Continue
4. All collars in the nearby area will appear in the list. Select the collars you want to remove from the pasture. Confirm by clicking on the green button in the bottom of the screen. Read the information carefully, and click on Confirm, remove pasture. Do not close the app before it is finished loading!
5. When the pasture has been removed via Bluetooth, a confirmation will appear in the app. In the collar list, it will say with red letters that the collar has been removed from the pasture. The virtual fence is now disabled, and it is safe to physically remove the collar from the pasture.

Please note the following:

- If your phone has mobile coverage, but the collar is not reporting, the collar will still appear in the

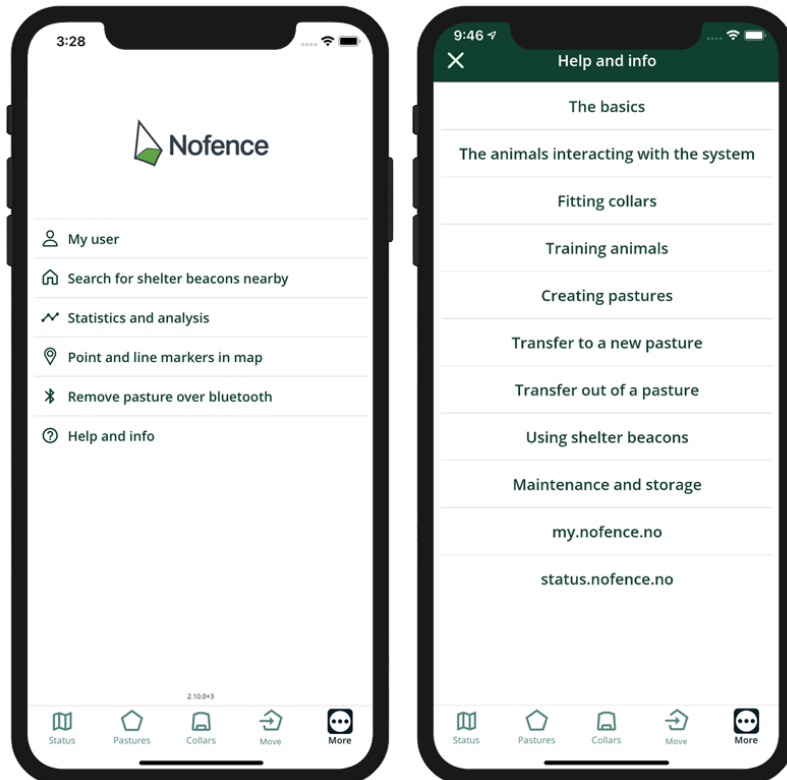


Assigned list, but with red letters informing that the pasture has been removed via Bluetooth.

- As soon as the phone is within coverage, and the collar is reporting, the app will move the collar to the Not assigned list. The red text explaining the pasture has been removed via Bluetooth will still be visible. The text will disappear as soon as the collar is reporting as normal.

## 4.6.7. Help and Info

In the Help and info section we have gathered a selection of topics from the user guide. These topics will provide answers to the most frequently asked questions from our customers, and are great to have easily accessible as you progress with your Nofence journey.



## 5. Maintenance

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Regular maintenance of the collars is important to ensure proper functioning and long lifetime of the collars. In this chapter you will find our recommendations on how to best take care of your collars.

Maintain your collars to ensure longevity and stable functionality.

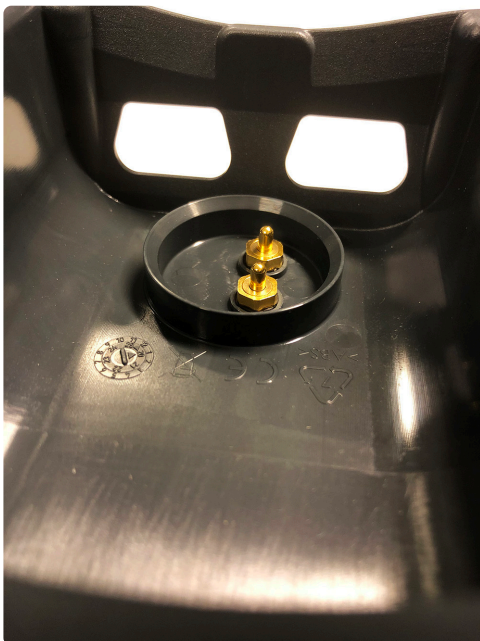
## 5.1. Maintenance and storage for sheep / goat collars

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Maintain your collars to ensure longevity and stable functionality.

### When changing batteries:

- Remove dust and debris from the collar's battery slot
- Apply CRC 5-56 or WD-40 to the battery poles every time you charge the battery
- Apply CRC 5-56 or WD-40 to the collar's contact pins when needed
- See to it that the solar panels are not covered by something (fur, mud, etc.), as this will make the collars charge poorly



### CRC

Our recommendation is to use CRC 5-56 or WD-40 as a lubricant for the contact pins and battery poles. These products drive out humidity and protect the contact points from corrosion.

### The contact pins need lubrication

The contact pins providing contact between the collar and the battery are spring loaded. To ensure that they pop out easily, we recommend that you apply one of the products mentioned above using a cotton bud. You may also press the pins slightly in and out using something soft, such as cotton buds. We also recommend that you apply the same procedure to the battery poles every time you charge the battery. This will protect against corrosion.

### At the end of the season

- Move the collars in the app to “no pasture”
- Remove the batteries from the collars – this will turn the system off and usage costs are halted
- Rinse the collars (including the solar panels) in lukewarm water, and use a nylon brush such as a toothbrush. Alternatively, use cotton buds. Do not use chlorine as it damages the solar panels. If you wish to use disinfectant, we recommend Virkon S
- Charge the batteries; they are to be stored fully charged to ensure maximum performance and durability
- The collars and batteries should be stored in a dry and clean place at room temperature
- If you are using leather neck straps, they should be treated with leather care products so that they stay soft and last longer

## 5.2. Maintenance and storage for cattle collars

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### At the end of the grazing season

- Move the collars in the app to “no pasture”.
- Remove the battery from the collar.
- Clean the collars and batteries in lukewarm water, using a nylon brush such as a toothbrush. Do not use chlorine as this can damage the solar panels. If you wish to use disinfection, we recommend using Virkon S.
- Charge the batteries; they are to be stored fully charged to ensure maximum performance and durability
- The collars and batteries should be stored in a dry and clean place at room temperature

### Ahead of the new grazing season

- Make sure there is no dust or mud on the battery poles. Clean the poles using a cotton bud if needed.
- Apply Vaseline at the bottom of the battery poles. Vaseline should only be applied to the poles on each side of the battery (+ and -), not in the middle one. See picture below.
- The battery is now ready to be used.



## 6. Other


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## 6.1. Troubleshooting

### The Nofence status page

For system info, go to the Nofence status page: <https://status.nofence.no/> . The app will notify you of any incidents in the status field.

Observation	Possible causes
 Missing report	<ul style="list-style-type: none"> <li>• The battery has insufficient power levels</li> <li>• Poor mobile coverage</li> <li>• Lost or damaged battery</li> <li>• The contact pins are stuck – check whether they pop out easily.</li> <li>• <b>Check if the collar starts reporting after a restart. (Remove the battery for 5 seconds and then put it back in the collar).</b></li> </ul>
The app shows the animals as being outside the Nofence pasture	<ul style="list-style-type: none"> <li>• The animals can for some reason not feel the electric pulse</li> <li>• Poor GPS conditions</li> <li>• Dead battery</li> <li>• The animals are on their way back to the Nofence pasture after a period of poor GPS conditions. Updating their positions may take a little time.</li> </ul>
The collar does not play audio warnings when it crosses the Nofence boundary	<ul style="list-style-type: none"> <li>• The new Nofence pasture has not been downloaded to the collar</li> <li>• The collar is not registered in any pasture</li> <li>• Poor GPS conditions</li> </ul>
The collar reboots constantly	<ul style="list-style-type: none"> <li>• Check the contact pins in the transition between battery and collar house. Make sure they pop out easily.</li> </ul>
The collar charges poorly	<ul style="list-style-type: none"> <li>• The solar panels are covered by something (check for fur, mud, etc.)</li> <li>• Do not use markers to write on the solar panels, it will affect the charging negatively.</li> <li>• Oxidation of contact points. Perform maintenance.</li> <li>• Damaged contact pins.</li> </ul>
The electric pulse does not work	<ul style="list-style-type: none"> <li>• If you have leather straps, they may have turned upside down.</li> <li>• If the chains on both sides come into contact with each other they will discharge the electric pulse.</li> <li>• If you extend the neck strap make sure that the extender material is conducting.</li> <li>• Thick winter fur can insulate the electric pulse.</li> <li>• The chains fail to come in contact with the animal's neck. Check if the fit is too loose or if the animal's neck is very small.</li> </ul>
Missing push notifications on Android	<p>Many Android phones have power settings that may cause push notifications from the Nofence app to cease. If you notice that push notifications following electric pulses or escapes are missing, try the following:</p> <ul style="list-style-type: none"> <li>• Make sure your phone does not restrict background data for the Nofence</li> </ul>

app. To do this, go to “Settings” and select “Apps”. Search for the Nofence app and select “Mobile data”. Make sure that both “Allow background data usage” and “Allow app while Data saver on” are switched on.

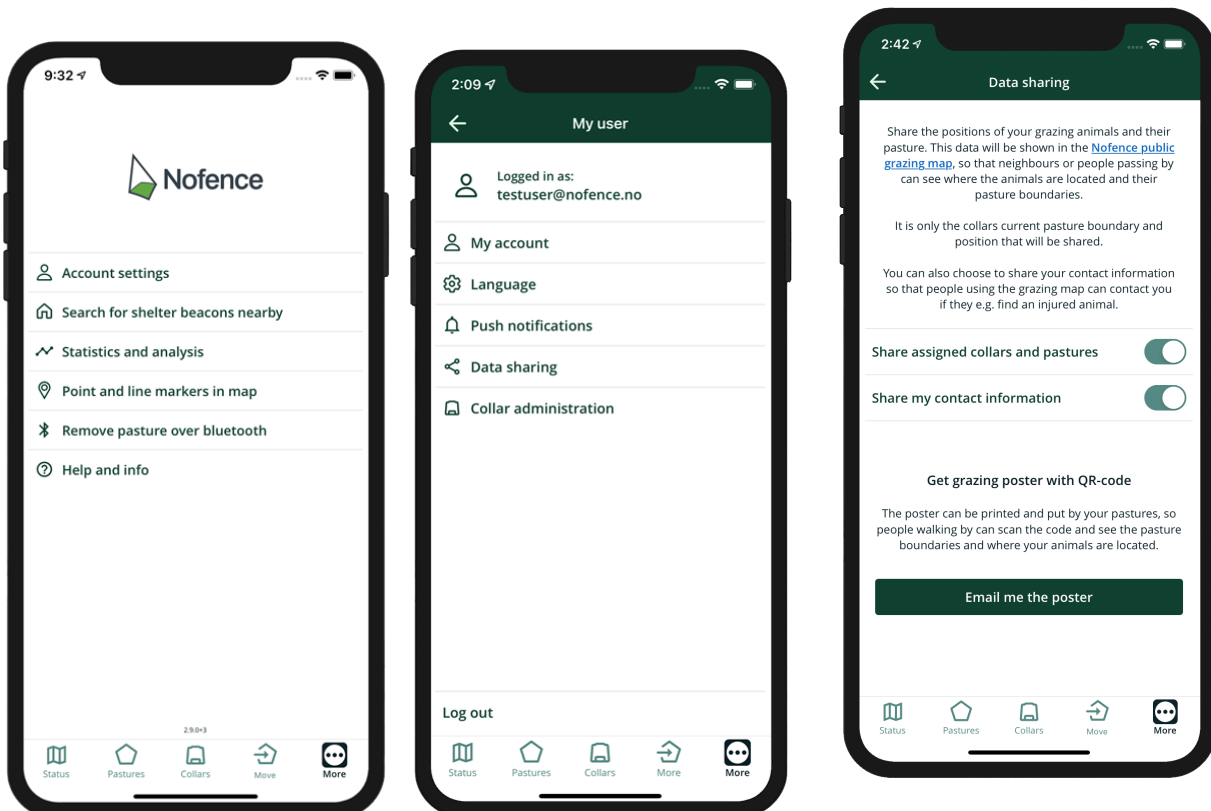
- Disable “Optimize battery usage” or add the Nofence app to the list of exclusions: Open “Settings” and select “Apps”. Find the Nofence app and go to “Battery”. The “Allow background activity” should be switched on. Then select “Optimize battery usage” and make sure that the Nofence app is not on the list of optimized apps.
- If you experience no push from the Nofence app on a Huawei phone, go to “Settings” and select “Advanced settings”. Go to “Battery” and make the Nofence app protected by marking it as a protected app.

## 6.2. The Nofence grazing map

In the [Nofence's official grazing map](#), people can view all Nofence collars and pastures within a 20km radius from their position. This can be helpful for people passing by the area, to avoid any unpleasant events between animals and humans.

Nofence have a grazing poster that informs about animals grazing in the area with collars, and that asks for caution. The QR code on the poster can be scanned to view the collars and pastures in the map. If your animals are grazing in a public area, we recommend using the poster to make this information easily accessible to people passing by. The posters are available in both Norwegian and English.

Please note that as a Nofence customer, none of your collars or pastures will be visible in the public grazing map before you have granted access yourself. To share positions and pastures in the map, as well as your own contact info, go to “My user” under the menu option “More” in the app and select “Data sharing”. You can then also have the poster sent to you on email.



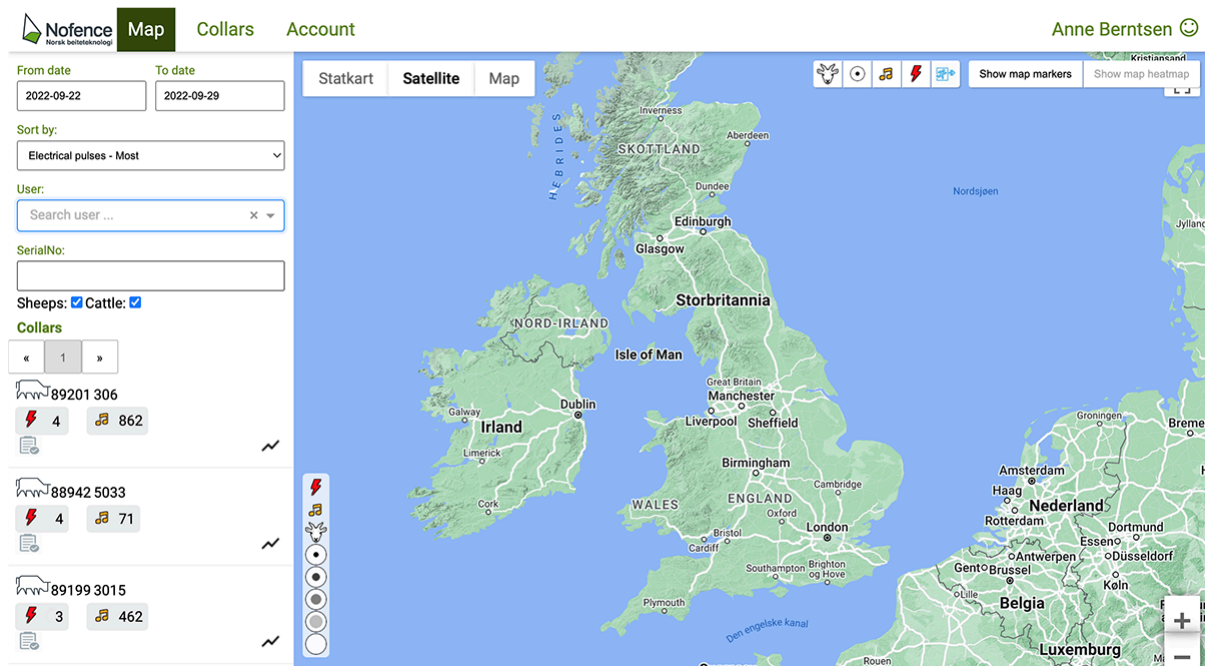
## 6.3. The web portal my.nofence.no

On our web portal [my.nofence.no](https://my.nofence.no) you can view the movement patterns for each of your collars, ever since you first started using them. This portal is a helpful tool to analyse the grazing, and makes it easier to optimize your pasture design. To login, please use the same login details as in the app.

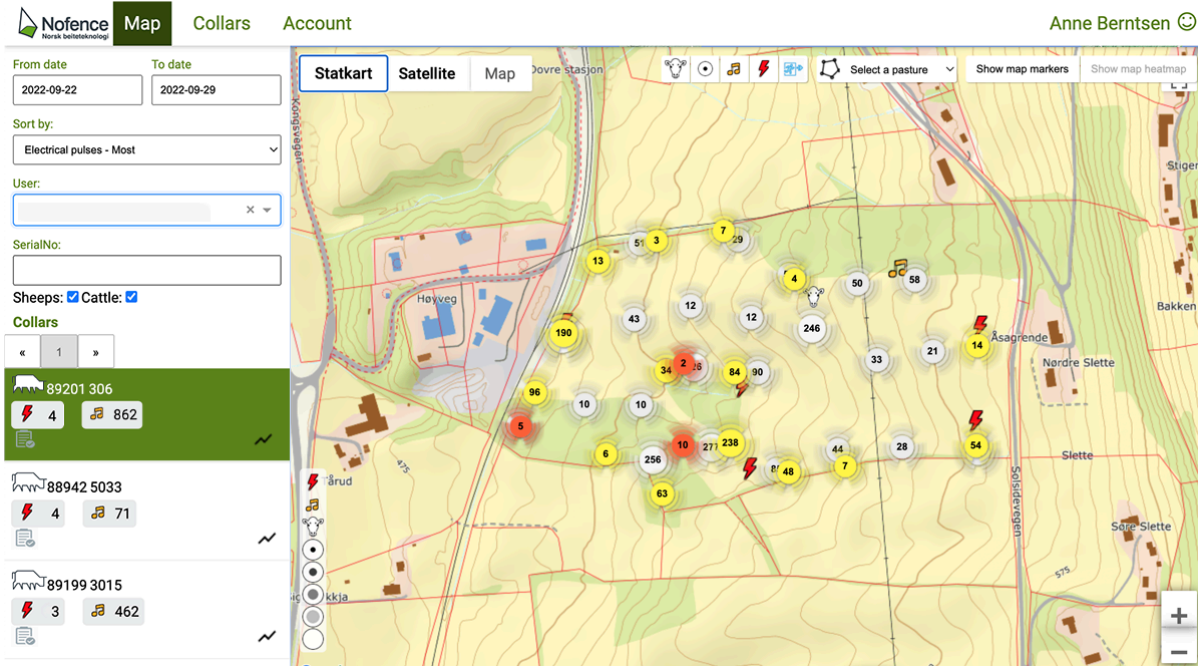
As mentioned, this portal gives you access to see where your collars have been located. However, please note that you can only watch the positions for one collar at a time. In the map you can view time an place for each registered position, as well as sound warnings, electric pulses and escapes.

Please note that it is not possible to create or edit new pastures in the web portal.

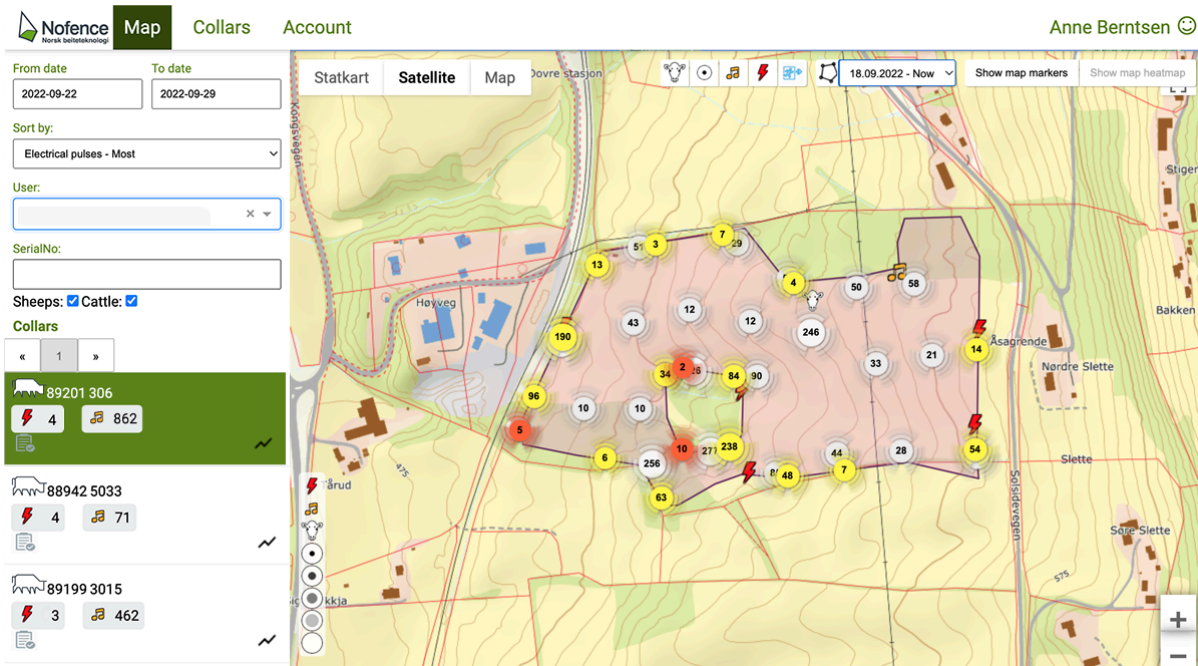
Select the time frame you want to view positions from in the upper left corner.



Click on the collar you want to view positions from in the column to the left. You can only select one collar at a time.

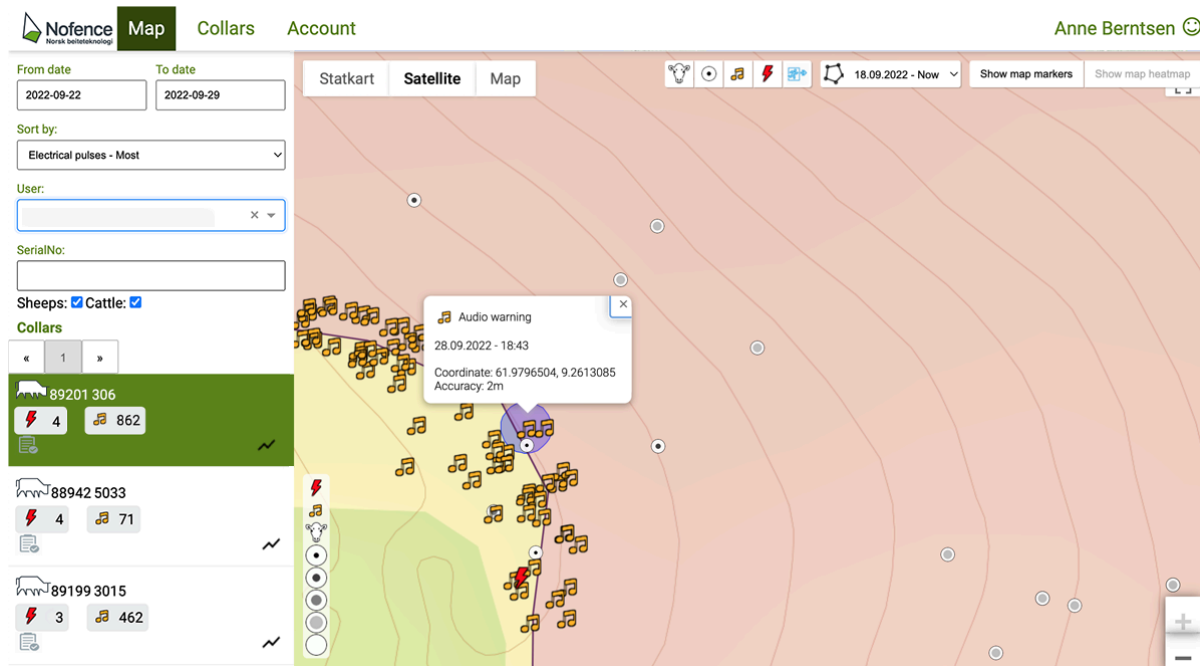


In the upper right corner you can select which pasture you want to view. All pastures from within the selected time period will appear in the drill-down menu. The pasture you select will be marked in purple in the map.

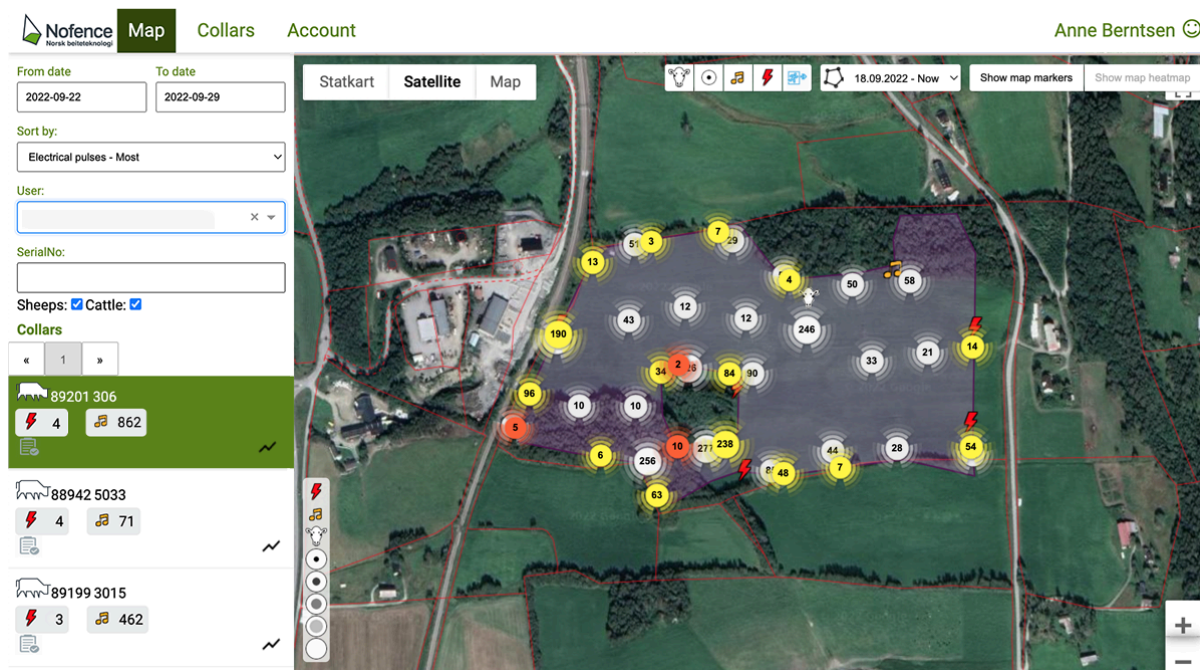


Zoom in to take a closer look at positions and incidents. Click on the position or incident to get more information about each one.





You can choose between satellite map and fly photo. In Norway you can also choose “Statkart”. The pictures are from the satellite map.

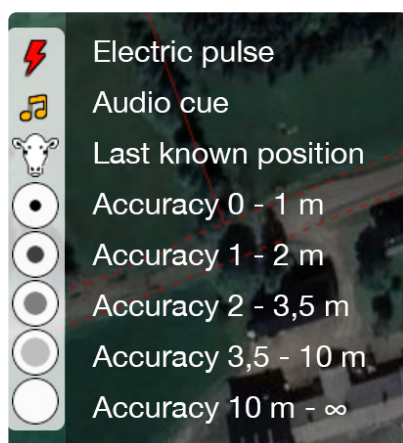


Choose heat map in the top right corner to see what part of the pasture the animals are using the most.





### Symbols in the map



## 6.4. Second Hand sale of collars?

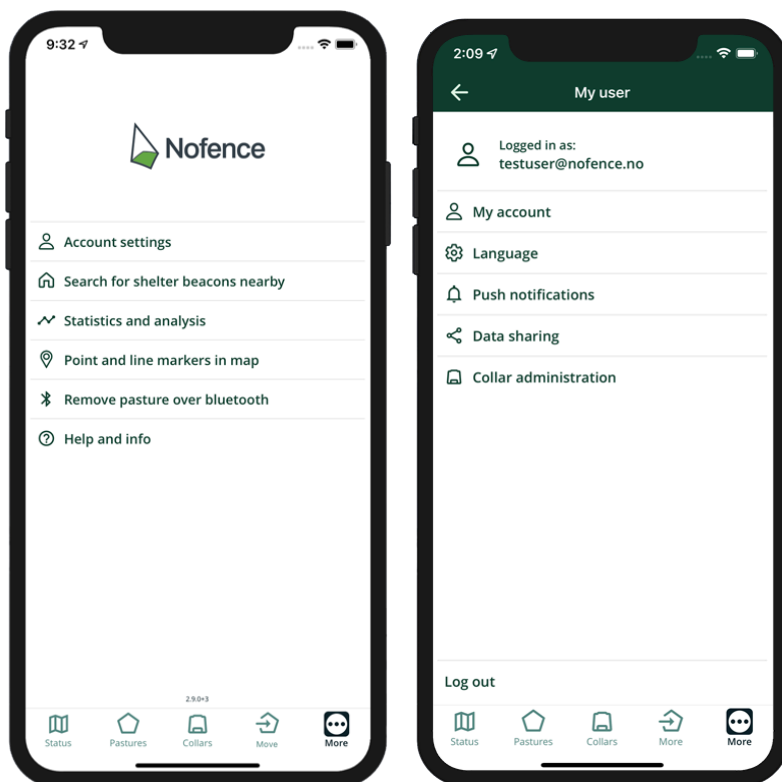
Do you not need your collars anymore, and want to sell them?

Second hand sales of collars is a deal between seller and buyer. You will have to remove the collars you are selling from your user in the app. If the buyer of the collars isn't a Nofence customer they will have to contact us via [support@nofence.no](mailto:support@nofence.no) to create a new user before the buyer is able to use the collars. The annual fee on the collars does not follow the collars, but the user, meaning that there will be generated a new invoice for the annual fee for the new user.

Before the transaction, it's important that you disinfect the collars. Use Virkon S and follow the instructions below.

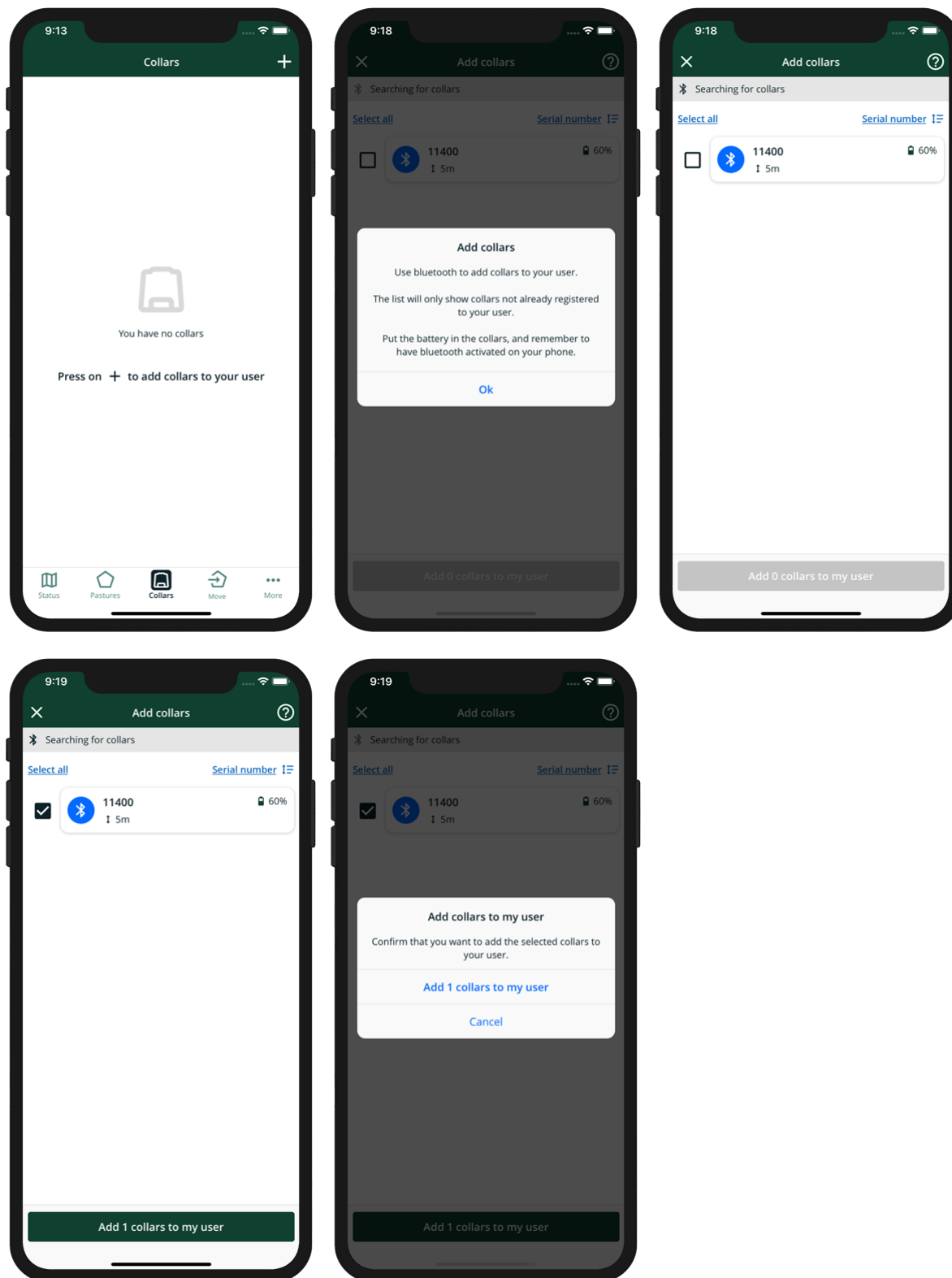
### This is how you do it:

To remove the collars you are selling from your user, select More from the main menu, then press Account settings and Administrate collars. Tick the boxes of the collars you want to remove and follow the instructions. Be sure the collars are set to "No pasture". Only you, or anyone who has access to your app, are able to remove your own collars from your own user.



**Once you have removed the collars you want to sell from your user, the new owner can add them to their account.** This functionality uses Bluetooth technology, so make sure to switch on Bluetooth on your mobile and insert a battery into the collar before you start.

Go to Collars in the main menu to see the collar list. Press on the plus icon on the top right of the screen to add the new collar to your user. The app will now show a list of all collars with Bluetooth contact. Select the one(s) you want to add to your user and confirm your choice.



The collars that appear with Bluetooth contact on the list, are all collars with Bluetooth contact. You will however only be able to add collars that do not have an owner. If you attempt to add a collar belonging to another user, an error message will appear.

## 7. Technical description

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## 7.1. The cattle collar

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A complete collar weighs 2lbs/1.3kg. The product has an IP rating of 67 and has a robust design tailored to withstand the wear and tear from cattle during grazing.

The chain that connects the collar house to the neck strap comes in two lengths – one standard size that fits most cattle individuals, and one large size that fits breeding bulls – and has two functions:

- Simplifies the adjustment of the collar's size as animals come in different sizes
- Carries the electric pulse from the collar house to the animal's neck.

For most animals, the chain will be more than long enough. If the chain is excessively long, we recommend cutting the outermost links off.

Should the chain be too short, you should add extra length to it. Let us know if you need to order extenders.

The collar has two solar panels – one on each side of the collar house. Direct sunlight makes for optimal charging conditions, but due to its innovative design, the collar also charges fine under less optimal

conditions. The solar panels have a robust design so that everyday wear causes only marginal decrease in the ability to charge.

The clasp that connects the chain and neck strap to the collar house can be dismantled if need be.

The collar communicates mainly via the mobile network, opting for the network with the best coverage at any time. The collar is also able to connect with your mobile phone using Bluetooth and NFC technology.

In order to optimize the receiver conditions, the antennas inside the collar are placed on the side of the collar, where the Nofence logo is found. The NFC tag is placed by the small notch on the short side of the collar.

The neck strap is made from TPU plastic, and is shaped to be as comfortable as possible for the animal. The neck strap design is identical on both sides, but remember to insert the chain from the inside when fitting the collar to an animal. This will result in proper chain contact with the neck. A metal slate has been cast into each end of the neck strap to prevent the chains from being ripped out during use. At high loads, the neck strap will stretch considerably and has a capacity of 440lbs/200kg.



Do not write on the solar panels as it impairs charging (and we don't want that to happen, do we? :)



## 7.2. The sheep and goat collar

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The complete collar weighs 1lb/0.5kg. The product has an IP rating of 67 and has a robust design tailored to withstand the wear and tear from sheep and goat during grazing.

The chain that connects the collar house to the neck strap has either nine or thirteen links. Collars with 9 links are suitable for females of most breeds, while collars with 13 links are suitable for rams and large female animals. A swivel joins the chain to the base in order to avoid twisting. The chain has two functions:

- Simplifies the adjustment of the collar's size as animals come in different sizes
- Carries the electric pulse from the collar house to the animal's neck

For most animals, the chain will be long enough. If the chain is excessively long, we recommend cutting the outermost links off. Should the chain be too short, you should add extra length to it. Let us know if you need to order extenders!

Please note that if you use the collar on the second outermost chain link, the outermost link may become vulnerable to mechanical stress (e.g. when scratching against wood or other materials), possibly causing the collar to fall off. In such cases, we recommend using a joint kit, but remember that the joint itself should not be used in the fastening mechanism on the neck strap.

The collar has two solar panels – one on each side of the collar house. Direct sunlight makes for optimal

charging conditions, but due to its innovative design, the collar also charges fine under less optimal conditions. The solar panels have a robust design so that everyday wear and tear causes only a marginal decrease in the ability to charge.

The collar mainly communicates via the mobile network, opting for the network with the best coverage at any time. The collar is also able to connect with your mobile phone using Bluetooth and NFC technology.

The antennas inside the product are placed in the front and to the sides in order to optimize the receiver conditions. The NFC tag is situated at the bottom of the collar.

The neck strap is made from TPU plastic, and is shaped to be as comfortable as possible for the animal. The neck strap design is identical on both sides, but remember to insert the chain from the inside when fitting the collar to an animal. A metal slate has been cast into each end of the neck strap to prevent the chains from being ripped out during use. At high loads, the neck strap will stretch considerably and has a capacity of 220lbs/100kg.

If you need to change the chains of the collar you will need to remove the lid on top of the collar. [Take a look at this video](#) to see how you change your chains.

The collar is not designed to withstand wear against concrete, nor should it be used together with an ordinary bell. Such use will result in significant wear and tear on the collar and limit the product lifetime.

! Do not write on the solar panels as it impairs charging (and we don't want that to happen, do we? :) )

## 7.3. Batteries

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**Battery for the cattle collar:** The battery has six 18650 Li-Ion cells. A fully charged battery is at 20,000 mAh, and takes fourteen hours to charge. The battery has an IP rating of 67.

The battery is clicked out by pressing the green buttons on both sides of the collar simultaneously. You will have to press with some force in order to release the button. If dust and debris collects around the button, press the button out, dismantle, and wash it for easier use. The collar should play the startup melody when a charged battery is inserted.

It is not possible to contact the collar via the mobile app unless the battery has sufficient power.



**Battery for the sheep and goat collar:** The battery has three 18650 Li-Ion cells. A fully charged battery is at 10,000 mAh, and takes eight to ten hours to charge. The battery has an IP rating of 67.

To switch the collar on, simply click the battery into the battery slot. To switch it off, take the battery out of the slot again. Make sure the battery sits well, you should hear a click as you insert it. You can change the collar's battery without taking the collar off of the animal.

It is not possible to contact the collar via the mobile app unless the battery has sufficient power.

! To ensure long battery lifetime, make sure the battery doesn't run empty. When the app reports the battery status at 5% it is time to charge.

## 7.4. Chargers

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**Battery charger for the cattle collar:**

Charging an empty battery takes approximately 14 hours. When the battery is completely charged, the charging indicator will display a constant green light.

**Battery charger for the sheep and goat collar:**

Charging an empty battery takes approximately 8-10 hours. When the battery is completely charged, the charging indicator will display a constant green light.

**The charging indicator:**

Constant yellow: Charging up to 80-95% of full capacity

Flashing yellow: Charges the battery to 100% capacity. This stage takes a maximum of one hour.

Constant green: Battery is fully charged.

**Error indicators:**

Two red flashes: The battery has been connected to the charger the wrong way.

Three red flashes: Charging has been interrupted. Check connection.

Four red flashes: Low battery voltage. Check the battery's status. If the voltage is too low, the charging will stop. Take the battery out of the charger and insert it again. Repeat until the charging indicator starts displaying a constant yellow light.

Five red flashes: Safety timer has run out. Check battery status or the voltage.

LED off: Battery voltage is too high. Check voltage.

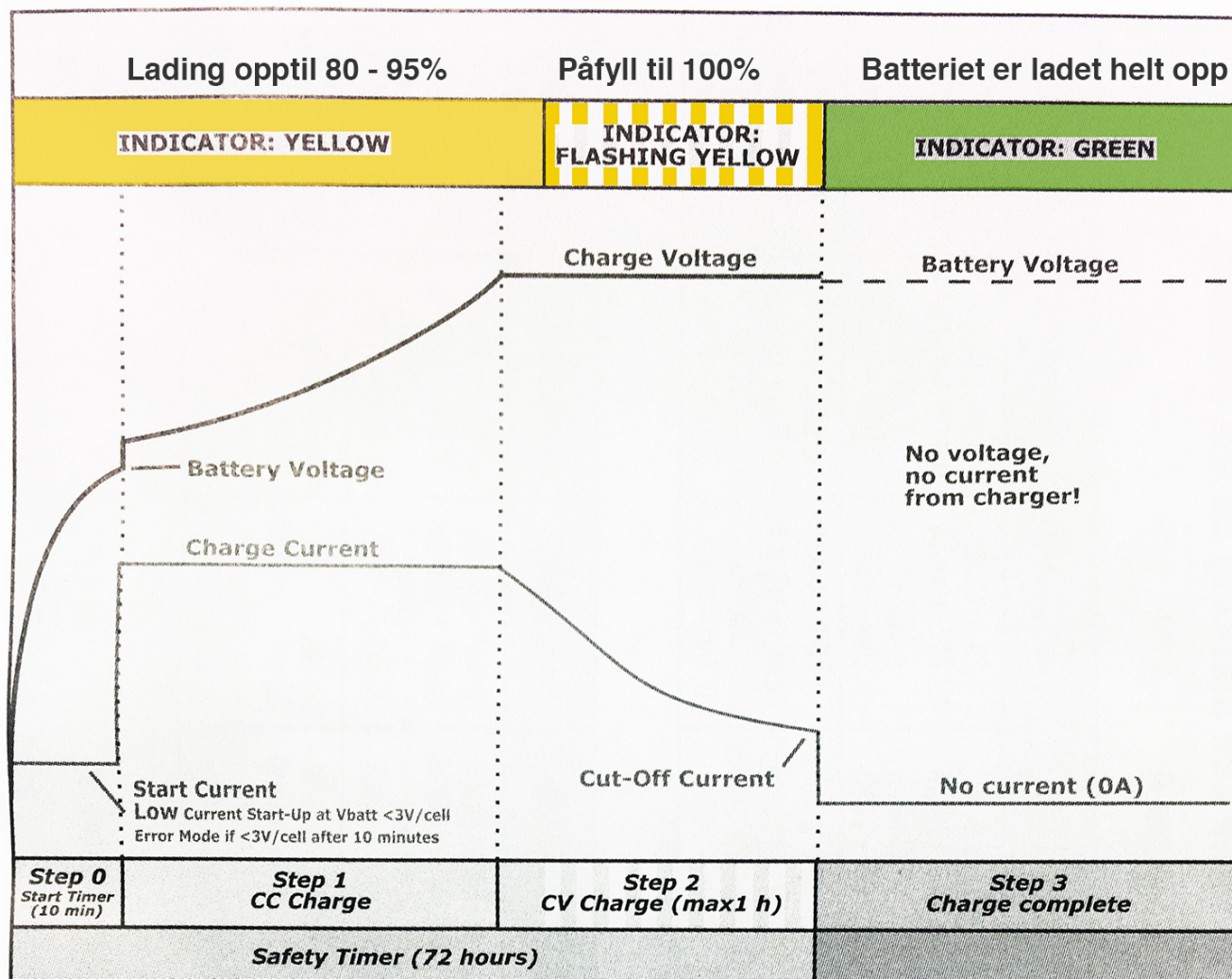
**Waiting mode indicators:**

Yellow with a red flash: Battery temperature is too low (less than 0 C).

Yellow with two red flashes: Battery temperature is too high.



## The charge cycle illustrated:



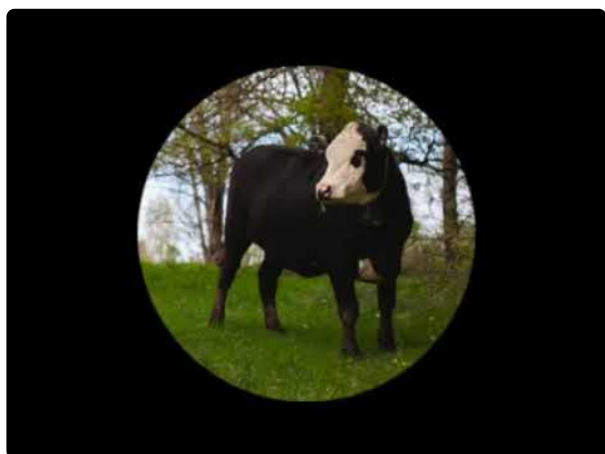
## 7.5. The audio cue

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The collar's audio cue is set off when the GPS receiver perceives the collar to be outside the Nofence boundary. It consists of a scale of tones, starting at a low pitch. The pitch will increase until the animal makes a turn and starts walking back to the Nofence pasture.

The audio cue is switched off as soon as the collar records a position that is one meter prior to where it started. The tone scale takes somewhere between five to 20 seconds to play, depending on the animal's speed.

The audio cue is designed to be predictable to the animal. If the tone scale is played to the end, the electric pulse is triggered. If the animal continues to walk away from the Nofence boundary, a new audio cue will start sounding two seconds after the previous electric pulse was emitted. If the animal has turned and is heading towards the Nofence pasture again, no audio cue is emitted. A third and final audio cue will start playing if the animal continues heading away from the Nofence boundary. After receiving a third electric pulse the animal is considered escaped and receives no further signals until it has returned into the pasture.



<https://www.youtube.com/embed/6SuDvg49uX4?rel=0>

*This is how the audio cue sounds.*

### Other audio signals

In addition to the audio cue, the collar has a start-up sound that is played when the battery is inserted. Further, it can play a locating tone if you need to find a collar that you cannot see.



[https://www.youtube.com/embed/g\\_M4SqCdB1k?rel=0](https://www.youtube.com/embed/g_M4SqCdB1k?rel=0)



<https://www.youtube.com/embed/pnjAENc-jZ8?rel=0>

## 7.6. The electrical pulse



The **sheep and goat** collar's power unit has a stored power of 0.1 Joule and max 3 kV. The **cattle** collar's power unit has a stored power of 0.2 Joule and max 3 kV. In comparison, a conventional energiser may not exceed a 5 Joule output rating, according to EU standards.\*

All our collars are tested to make sure that the electric pulse is at least 1.5 kV. The pulse must be felt in order for the system to work, as

this makes the system predictable to the animal. Moisture, and the substance of the animal's fur may impact the animal's experience of the electric pulse. Nofence has documented that effective containment can be achieved when the electric pulse is between 1 and 3 kV. Thus, not too strong, but not too weak.



People with heart diseases or a Pacemaker should avoid receiving a pulse from the collar.



So-called "intelligent" electric fence devices can have up to 15 Joules of stored energy.

## 7.7. The accelerometer

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The collar is equipped with an accelerometer that records movement. The accelerometer data aids the decision to play the audio cue quickly or slowly. Data from the accelerometer is also used to determine whether the animal is at rest.

If very little movement is recorded over a period of 10 minutes, the collar's GPS is switched off in order to save power.





## 7.8. Firmware update

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Nofence is constantly evolving and will, therefore, update the collar's firmware from time to time. The collar is in contact with the Nofence server via the mobile network. When the collar is communicating with the server, it checks for available updates. If the server has a new firmware version, the collar will automatically download it. The criteria is that the collar is reporting, which means that it must have mobile coverage and a battery with sufficient power.

After storing collars over winter, we recommend inserting the batteries overnight before using them on animals. This gives the collars sufficient time to download any available updates.



## 8. Downloads

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## 8.1. Grazing Posters

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Click on the links below to find the grazing posters:

[Grazing poster cattle](#)

[Grazing poster sheep](#)

[Grazing poster goat](#)

## 8.2. Product data sheet

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Click on the links below to find product sheets:

[Cattle collar](#)

[Cattle collar battery](#)

[Cattle collar battery charger](#)

[Sheep and goat collar](#)

[Sheep and goat collar battery](#)

[Sheep and goat battery charger](#)

## 9. What is good animal welfare?

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The concept of animal welfare is concerned with the individual animal, the type of situation the animal is in, and how the animal experiences its situation. When animals have good welfare, they thrive. Well-being draws on interactions between health, environment, animal care, and the characteristics of the animal itself.

An often-used explanation of what good animal welfare is, can be found in the 'Five Freedoms' laid out by the Brambell Committee (1965):

- Freedom from Hunger and Thirst: by ready access to fresh water and a diet to maintain full health and vigour.
- Freedom from Discomfort: by providing an appropriate environment including shelter and a comfortable resting area in all situations.
- Freedom from Pain, Injury, and Disease: by working towards prevention or rapid diagnosis and treatment of sick animals.
- Freedom from Fear and Distress: by ensuring that the animal has conditions and treatment that avoid mental suffering.
- Freedom to Express Normal Behaviour: by providing sufficient space, proper facilities, and company of the animal's own kind.

So on one hand, we must make ethical assessments, while on the other, we must use facts from research.

The subject of ethics addresses subjective values in relation to animal welfare. We can ask ourselves 'What would our society consider to be a sufficient quality of life for animals?' Another question is 'How can we understand the concept of "quality of life" for animals specifically?' How are animals affected by their surroundings and how do they experience their situation? We often try to describe the condition of an animal based on its mastery of the environment in which it lives. The level of welfare is described as the balance between positive and negative experiences. Based on such an understanding, we use the following definition of animal welfare:

"Animal welfare is the subjective experience of the individual of its psychological and physical condition as a result of its attempts to master its environment."

Within biology, 'mastery' is defined as the mechanisms used by an individual in order to maintain control. An animal displaying normal behaviour for its kind, thus shows signs of good physical and mental health.

Nofence Grazing Technology has been developed with a focus on animal well-being. Therefore, it is vital that you are knowledgeable about your animals and take the time to learn how the technology works. Key points for achieving good animal welfare by using Nofence are:

- All adult animals in the herd should wear a collar.
- Become well-acquainted with our recommendations.
- Create Nofence boundaries that are easy for the animals to understand and follow our

recommendations for the design of the Nofence pasture.

- Follow up on all electric pulses. You should take the time to analyse why goats are receiving electric pulses and take action. Actively use our online portal [my.nofence.no](https://my.nofence.no) to analyse grazing movements. Are there challenging restrictions, temptations, places outside the boundary where they enjoy dwelling, or are they just heading towards people? Perhaps a small adjustment of the boundary will suffice? Should the app notify you of multiple electric pulses, you should check that the equipment is fitted properly and is hanging correctly. If you suspect that the collar's power supply is defective, you should take the equipment off the animal before testing its functionality.
- Checking that the equipment is properly fitted to the animal and that it is hanging correctly.
- Pay close attention to any chafing. Should the coat of the animal wear away completely, the collar must be removed to avoid wounds. If an open wound develops, it may be a long time before the animal can wear the collar again. A veterinarian should be consulted in the event of an open wound.

## 10. Contact us

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If you have any questions concerning the use of Nofence, please do not hesitate to call us at +44 1952 924012 or send an email to [support@nofence.no](mailto:support@nofence.no).



# 11. FCC USA Compliance Statement

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This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Nofence has not approved any changes or modifications to this device by the user. Any changes or modifications could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Contains FCC ID: XPYUBX18ZO01, ISED ID:8595A-UBX18ZO01) with an integrated antenna.

This product emits radio frequency energy, but the radiated output power of this device is far below the FCC radio frequency exposure limits.

This equipment complies with FCC RF radiation exposure limits for an uncontrolled environment. Nevertheless, the device should be used in such a manner that the potential for human contact with the antenna during normal operation is minimized.

In order to comply with FCC RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.

## 12. ISED Canada Compliance Statement

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This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS. Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device."

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

1. L'appareil ne doit pas produire de brouillage ;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

"In order to comply with ISED RF Exposure requirements, this device must be installed to provide at least 20 cm separation from the human body at all times.

"Afin de se conformer aux exigences d'exposition RF ISED, cet appareil doit être installé pour fournir au moins 20 cm de séparation du corps humain en tout temps.

CAN ICES-3 (B)/NMB-3(B)