Dartmoor Healthy Trees for Tomorrow Survey

Project Summary Report

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CONTENTS

		Page Number
1.0	**Introduction**	**1**
2.0	**Case Studies on Methods Used**	**3**
3.0	**Monitoring**	**9**
4.0	**Project Evaluation**	**12**
5.0	**Conclusions**	**17**

References

Maps (embedded in report)

Map 1 – Site Location Plan

Map 2 – Holne Moor 2023 interim results

Appendices

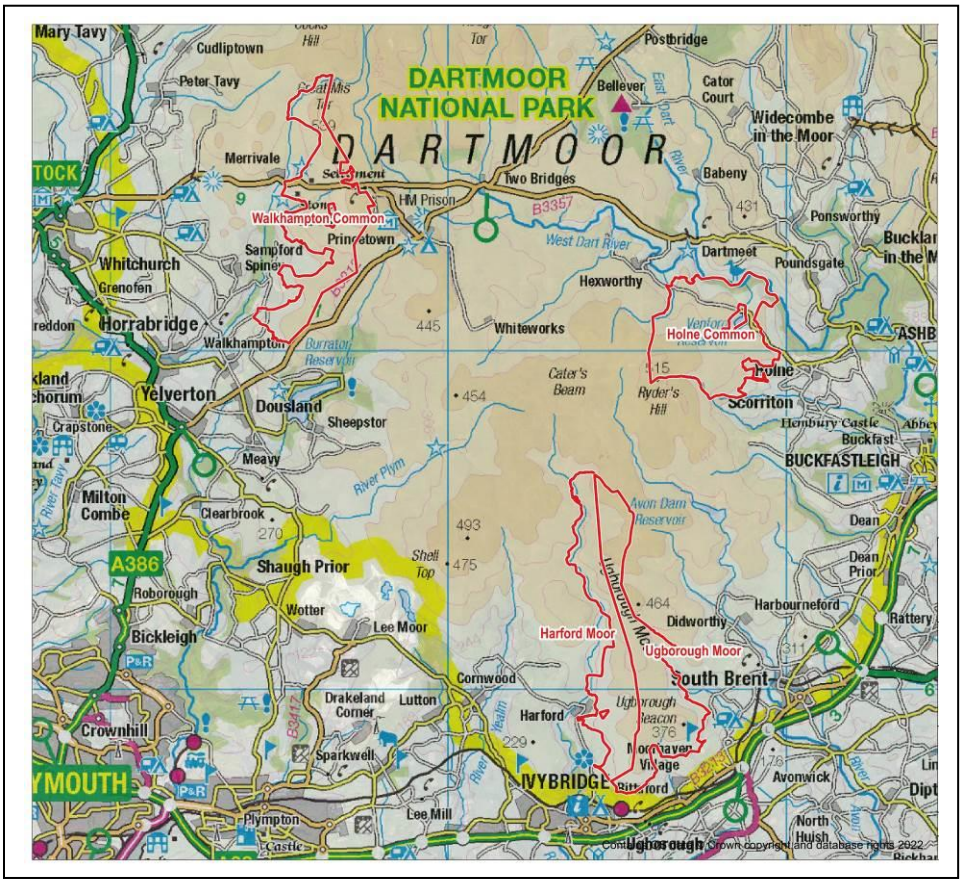
Appendix 1 – Survey Form

Appendix 2 – Examples of Areas on Dartmoor with Increased Tree Cover (natural or planted)

1.0 INTRODUCTION

1.1 Corylus Ecology and Evolving Forests worked with the Foundation for Common Land, in consultation with Dartmoor National Park Authority and Dartmoor Commoners' Associations, to develop a method for undertaking surveys of open-grown trees on Dartmoor's commons. Surveys were subsequently carried out by volunteers during 2022 and 2023 for a series of commons: Harford and Ugborough Moors, Holne Moor and Walkhampton Common (see Map 1).

Map 1: Site Location Plan



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1.2 This work was carried out in relation to a tree regeneration project on Dartmoor, which forms part of the Our Upland Commons project through the Our Common Cause Partnership. The core objectives were to:

- Better understand the number, age, distribution, health of individual trees on commons;
- Use data gathered during the survey to inform two trial projects for increasing tree cover on Dartmoor.

1.3 This work aimed to move away from the often-polarised view of trees on Dartmoor, which tended to focus on a debate over woodland versus open ground. The work pointed to an acknowledgement that,

naturally, woodland would give way to open ground through an extensive area of open grown trees and smaller wooded patches, based on elevation, ecology and geomorphological changes.

1.4 The project team's approach to delivering the project aims was to view this work as the start of a much longer-term evolution of the edges of the moor: a transition to a more naturalistic relationship between trees and open ground that also engages local communities in a way that instils a wood culture as part of a wider land-use culture. The survey was designed to give as much detailed information as possible but equally to engage people and help to understand the connection of local people to these areas.

1.5 The surveys were funded thanks to the Our Upland Commons Project, with additional funding made available by the Dartmoor Headwaters Project and the Environment Agency. Our Upland Commons is a £3 million project helping to secure the future of upland commons in England. Ending in December 2024, 12 commons across four parts of the country are involved, including three in Dartmoor National Park. Led by the Foundation for Common Land, Our Upland Commons has been made possible by grants from The National Lottery Heritage Fund, Esmée Fairbairn, Garfield Weston Foundations plus local funders Dartmoor National Park Authority, Devon Wildlife Trust and Dartmoor Preservation Association. This report has been prepared for the exclusive use of the Foundation for Common Land. No part of this report should be considered as legal advice.

2.0 CASE STUDIES ON METHODS USED

2.1 Background

Survey Methods

2.1.1 Following a project inception meeting at the Dartmoor National Park Authority (DNPA) headquarters at Parke, and prior to work beginning on the ground, early-stage preparatory work was undertaken in order to provide background information for the survey and planting work. This included:

- Building a GIS project, including mapping and aerial imagery, based on data provided by the project partners such as DNPA and the South West Partnership for Environmental and Economic Prosperity (SWEEP). This was combined with other information such as Forestry Commission modelling using Ecological Site Classification and climate modelling tools.
- Rapid assessment of the commons to be surveyed and adjoining areas to allow the survey to be tailored to the specific conditions of each area. This rapid assessment was an informal coverage of the area on foot to ensure the survey methodology was fit for purpose.

2.1.2 Health and safety systems were put in place and agreed with project partners to ensure the safe delivery of the project outputs. For instance, these systems required all volunteers to work in at least pairs and to avoid hazardous areas, such as quarries. Insurance was arranged to cover the volunteer activities, with volunteer registration forms and risk assessments designed and approved for use as part of the project.

2.1.3 Delivery of the survey involved developing a robust and repeatable survey methodology, in consultation with stakeholders, suitable for use by volunteers and for covering large areas. The technique had to be suitable to accommodate a variety of landscapes, such as:

- Exposed moorland tops with individual scattered trees and little or no regeneration;
- Open ground with widely dispersed trees where natural regeneration may be occurring;
- More closely spaced trees leading to the densely wooded fringes where more extensive natural regeneration may be occurring.

2.1.4 Discussions were held with other organisations, such as Historic England, regarding potential recording techniques. In addition, investigations were carried out into potential apps to use for the survey recording form and mapping, particularly looking at GIS Cloud. Following initial field trials, the survey technique was presented to and discussed with Dartmoor commoners and landowners. Their feedback was used to refine the methodology prior to the start of field survey.

2.1.5 Survey data gathered by volunteers and the project team were combined with desk-based information to draw up a baseline for open grown trees across these commons. The survey area extended from the edge of existing woodlands to open moorland, with identification of recent natural regeneration in these areas. The survey results were recorded and mapped using Cloud GIS in the field (see Appendix 1) and

later exported to programmes including MS Excel and QGIS for interrogation. A database was developed containing the full survey results, with attributes recorded including:

- Location (latitude and longitude);
- Species;
- Altitude;
- Approximate height and stem diameter;
- Growth stage (e.g. sapling, semi-mature, mature, dying);
- Crown shape (e.g. fan, oval, spreading, cone, windswept);
- Health (including signs of any dieback, leaf discolouration, root exposure etc);
- Signs of browsing; and
- Presence of lichens or fungi.

2.1.6 For trees growing in a group of similar trees of the same species, the number of trees in the stand was also recorded. Additional details were recorded for certain attributes, such as ground conditions where saplings were recorded, details of browsing damage, presence of any dead limbs attached or near to the tree, or whether dead trees were standing or fallen.

2.1.7 Following feedback from surveyors and the project team, areas of bracken were prioritised for early completion, as surveying these areas later in the season would have prevented recording of early-stage natural regeneration which would be concealed beneath dense stands of bracken. This limited the survey period to between mid-May (after budburst) and early July (prior to full bracken coverage).

Methods for Increasing Tree Cover

2.1.8 Part of the project aims included considering options for increasing tree cover on Harford and Ugborough Moors and Holne Common. A number of areas on these commons, where increasing tree cover could be considered to be appropriate based on the survey results, were put forward for further discussion with landowners, commoners and other stakeholders such as DNPA, Natural England and the RSPB. These were provided from a tree-based perspective only and did not include other constraints, such as any archaeological, ecological or farming constraints, which might mean increasing tree cover may not be a viable option for certain areas. Stakeholder consultation was therefore carried out by the Foundation for Common Land.

2.1.9 Various approaches to increasing tree cover were considered, including:

- Natural regeneration, for example leaving fenced areas free of browsing to enable naturally occurring regeneration to become established and to test the efficacy of stored seed already present;

- Conventional planting of 'whips' using tubes and stakes and standard spacing;
- Very dense planting of whips/bare root stock that allows the density of planting to act as the protector;
- No till type planting, using collected local seed spread in fenced areas.

2.2 Case Study 1: Harford and Ugborough Moors

2.2.1 A volunteer recruitment drive was undertaken to recruit a group of at least 20 volunteers for the 2022 survey season. The project was advertised through relevant local Facebook groups (e.g. Plymouth Tree Partnership, Ashburton and Ivybridge Facebook pages, Dartington Noticeboard Facebook page) and DNPA's volunteer network. Places at the training events were filled within one week of advertising.

2.2.2 The first training event for the volunteer surveyors was carried out at Harford Moor Gate, after which time the volunteers arranged themselves into pairs in which they would carry out the survey. The survey area was subdivided to facilitate allocation of an individual 'patch' to each pair of volunteers; patches were mapped electronically on QGIS, with paper maps also provided to surveyors. Support was provided to all volunteers (primarily by phone, email and WhatsApp) to help them to carry out the survey, with a health and safety group which surveyors were required to sign in and out of when working in the field.

Volunteer training event on Harford Moor

Area of regeneration on Harford Moor

2.2.3 Following completion of the survey, a number of areas were identified in which it was considered that increasing tree cover could potentially be appropriate. The options considered focussed on two broad approaches: protection of naturally occurring regeneration and new tree planting. These options were presented to and discussed with landowners, commoners and other stakeholders, for instance DNPA and Natural England, during a consultation event and a series of field visits in 2022 and 2023.

2.2.4 Following consultation, and an invitation for stakeholders to feed in their own suggestions for increasing tree cover, the proposals were refined to comprise the addition of a series of cactus guards across part

of Ugborough Moor and an area of fenced tree planting on Harford Moor, to be carried out through the Dartmoor Headwaters Project. The aim is to reduce grazing/browsing pressure through trialling two contrasting methods in several areas that were agreed between stakeholders and the Foundation for Common Land.

2.3 Case Study 2: Walkhampton Common

2.3.1 A recruitment drive was undertaken to recruit a group of volunteers for the 2023 survey season, to look at Walkhampton Common. As with the previous surveys, the project was advertised through DNPA's volunteer network and local Facebook groups (e.g. Walkhampton Village Hub and Dartmoor National Park).

2.3.2 In order to trial different approaches to this type of citizen science survey, the Walkhampton surveys were undertaken using a different approach to those carried out previously. A series of volunteer survey days were undertaken during the period May to July 2023, with small groups of volunteers working with individual members of the project team following an initial project briefing and training session. The area was divided into survey patches, as for the 2022 surveys, but rather than pairs of volunteers being assigned a patch to survey in their own time, the approach in 2023 involved a group surveying a patch or several patches on any given set survey day through the season.

Survey on Walkhampton Common

Regeneration on Walkhampton Common

2.3.3 The aim of the work on Walkhampton Common was to provide survey results only and the provision of proposals for increasing tree cover was not required in this instance.

2.4 Case Study 3: Holne Moor

2.4.1 The recruitment of volunteers for the Holne Moor survey was carried out as part of the recruitment for Harford and Ugborough Moors in 2022 and for Walkhampton Common in 2023. The initial training event was held at Venford Reservoir in 2022, following which pairs of volunteers were allocated a survey patch

to survey during that season. As for Harford and Ugborough Moors, patches were mapped using both QGIS and paper maps, with support provided to all volunteers to help them to carry out the survey of each allocated patch.

2.4.2 The initial survey results showed there is already considerable natural regeneration occurring on Holne Moor. This meant it was not possible to complete the survey in 2022, given the limited time window between budburst making even the smallest trees visible and bracken coverage later restricting visibility, and an alternative approach was trialled in 2023, in line with the technique for Walkhampton Common, with small groups of volunteers assisting the project team on set survey days. Even with this approach, it was not possible to complete the survey during the project timeframe. Additional funding has since been secured and the survey is due to be completed in 2024 by surveying all remaining areas and providing an overall assessment for this common.

2.4.3 In the latter part of 2023, prior to funding being secured for completion of the survey in 2024, the survey methodology for Holne Moor was adapted and a transect surveying approach was employed in order to gather a picture of tree cover across survey compartments and allow extrapolation of survey results. The moor was divided up into compartments of similar ground types and 25m wide transacts walked in W patterns on each compartment with staff and volunteers.

Tree-lined gulley on Holne Moor

Isolated scattered regeneration on Holne Moor

2.4.4 Given the extent of natural regeneration compared to other areas surveyed, the proposal for increasing tree cover on Holne Moor focussed entirely on the protection of naturally occurring regeneration. Subject to the necessary consultation and constraints checking, the recommendation was to extend existing areas of tree cover at the edges of the common, for instance in proximity to the River Dart and Venford Reservoir, further out into the common by the use of protective fencing to reduce grazing/browsing pressure. The aim was not to create new areas of woodland, but rather to encourage the regeneration that is already naturally occurring in these areas and promote the development of additional wood

pasture type habitats around the site, with scattered trees present through areas of grassland and moorland.

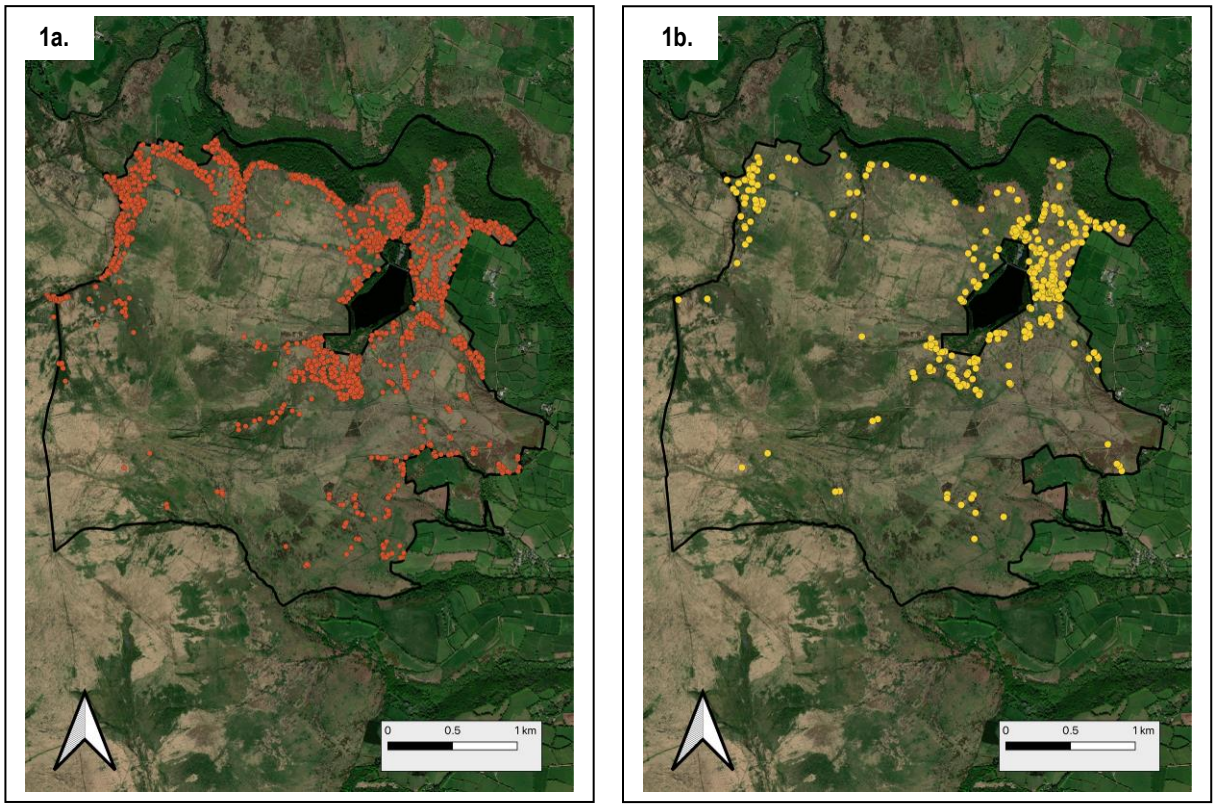
2.4.5 Following the surveys in 2022 and 2023, the preliminary results and initial ideas for increasing tree cover were discussed at a consultation event with landowners, commoners and other stakeholders in January 2024. Invitations were issued for the input of any suggestions for increasing tree cover on Holne Moor; a number of proposals were received and are being consulted on by the Foundation for Common Land prior to any work commencing on the ground.

3.0 MONITORING

3.1 Survey of Trees on Common Land

3.1.1 The results gathered through the Dartmoor Healthy Trees for Tomorrow Survey provide a useful baseline dataset against which any future change in tree cover and distribution can be gauged for the commons surveyed to date. Map 2 below shows an example mapping output from the interim report for Holne Moor produced in 2023, with all data points recorded at that time (including both individual trees and groups of trees) shown in red and saplings alone in yellow.

Map 2: Holne Moor 2023 interim results (a. all data points recorded; b. saplings recorded)



3.1.2 The survey recorded a total of 7,020 trees, of which 1,348 or 19% were saplings, across the commons included in the project (including the currently incomplete survey of Holne Moor). This can be broken down as follows:

- Harford and Ugborough Moors – 1,668ha common with a total of 1,398 trees recorded, of which 228 are saplings (16% of total), equating to 0.8 trees per hectare of this common;
- Walkhampton Common – 984ha common with a total of 1,376 trees recorded, of which 136 are saplings (10% of total), equating to 1.4 trees per hectare of this common;
- Holne Moor – 961ha common with an interim total of 4,246 trees recorded, of which 984 are saplings (23% of total) recorded, equating to 4.4 trees per hectare of this common to date (survey to be completed in 2024).

3.1.3 All of the areas surveyed showed signs of regeneration taking place naturally, as well as areas where tree cover is being increased by design through tree planting. However, it was clear that the number of saplings as a proportion of all trees varied between the different commons. It would be interesting to revisit these commons in future to assess the change over time, for instance looking at changes in the numbers of trees, species composition, age structure and other attributes assessed during this survey, including the proportion of saplings present as an indicator of the amount of natural regeneration taking place.

3.1.4 The survey methodology used was designed to be repeatable, either in full or in part, which means it should be possible to conduct repeat surveys in future and undertake a comparison of results. It will be important that appropriate caveats are applied to the interpretation of results, for instance regarding data that are qualitative and subjective rather than quantitative. A number of recommendations for minor adjustments to the methodology to reduce subjectivity have been proposed. For example, this would include providing a series of set options for sapling growing conditions rather than free text and more detailed examples of how to measure grazing/browsing. In addition, it would be useful to find a way to map all trees within groups, so that the full set of data points are visible, in a way which did not involve recording the same data repeatedly for each group member as this would make the survey prohibitively time-consuming.

3.1.5 Intervals for repeating the survey are likely to depend to a large extent on external funding sources or the availability of volunteer projects. Suitable periods could be in the region of 10-15 years. However, it is recommended that areas of natural regeneration are revisited more frequently, particularly the very small saplings recorded, to see whether any changes are recorded to these within a shorter timescale.

3.2 Increasing Tree Cover

3.2.1 The Dartmoor Healthy Trees for Tomorrow Survey, which ran from spring 2022 to spring 2024, included proposals for increasing tree cover on several of the commons. During this timeframe, the outputs in relation to increasing tree cover have, with approval from the project manager, been amended. A series of cactus guards have been installed on Ugborough Moor and a fenced area of planting is due to soon be installed on Harford Moor. Discussions with stakeholders for Holne Moor are underway.

3.2.2 Monitoring beyond the end of the current project in spring 2024 will be an important legacy of the project and could include:

- Continued monitoring of all saplings in the first five years, ensuring any tree tubes, guards and/or fencing remain in situ and in functional condition and are fulfilling their roles of protecting tree growth.

- Monitoring all saplings for at least five years to ensure any planted saplings that are lost are replaced and, for any natural regeneration that is lost, additional saplings should be identified and protected to ensure no net loss of naturally regenerating saplings.
- Regular monitoring of the interiors of the fenced areas and adjustment of management regimes as necessary. Without correct management any fenced areas may simply turn into woodland over time, rather than the intended wood-pasture habitat.
- At five years an assessment needs to be made of any fencing and tree tubes to allow them to be removed at the earliest point at which the trees are thought to be established enough to withstand environmental threats and grazing. Consent for fencing may be required, for instance for retention beyond that period.
- Monitoring of tree growth over a ten-year period to inform future planting plans.
- Promoted regeneration and new planting needs to be noted and surveyed regularly against each other to assess the viability of different management regimes.

3.2.3 Monitoring could be carried out by a variety of different parties, including landowners, commoners and other stakeholders or volunteers. For instance, on Ugborough Moor the landowners have taken on the responsibility for the cactus guards that have been installed to protect scattered regeneration, including carrying out regular checks, whilst on Harford Moor the University of Plymouth have proposed a monitoring programme for the planting being carried out through the Dartmoor Headwaters Project.

3.2.4 A key part of this monitoring programme will be to follow up the findings, as necessary. For instance, this may involve carrying out practical works on the ground to address any issues that are identified through this monitoring programme.

3.2.5 Ideally it would be useful to establish a number of control plots across these areas in order to illustrate what changes, if any, would happen naturally over time. This could involve fencing small areas which do not currently include any natural regeneration. No other treatments would be required within these plots, but monitoring should be undertaken to assess any change.

4.0 PROJECT EVALUATION

4.1 Summary of Survey Results

4.1.1 The survey recorded a total of 7,020 trees across the commons included in the project to date: Harford and Ugborough Moors, Walkhampton Common and Holne Moor (currently incomplete). Of these trees, around 19% were saplings, including a mix of planted and naturally regenerating trees. Data were collected for all of the open-grown trees on these commons, including at least one photograph of each tree, which will form a baseline against which future change can be monitored.

4.1.2 For Harford and Ugborough Moors, the survey recorded 1,398 trees during 440 hours of survey time by 14 volunteers in 2022. At least 11 tree species were recorded across the survey area, with the majority of trees recorded being hawthorn, rowan, blackthorn or oak. The other species recorded include willow, holly, sycamore, hazel, alder, beech and birch. Around one third of the trees were recorded growing in groups of similar trees, particularly blackthorn, rowan and willow.

4.1.3 For Walkhampton Common, the survey recorded 1,376 trees by 17 volunteers and six members of the project team during 204 hours of survey time in 2023. At least 10 tree species were recorded across the survey area, with the majority of trees recorded being hawthorn, followed by willow and oak. The other species recorded include rowan, beech, holly, sycamore, blackthorn, birch and alder. Around one quarter of the trees were recorded growing in groups of similar trees, particularly hawthorn, willow and beech.

4.1.4 For Holne Moor, the survey recorded 4,246 trees during 312 hours of survey time carried out by 22 volunteers, as well as additional time by the project team, during 2022 and 2023. Due to the high number of trees recorded on this common the surveys are due to be completed during 2024. At least 11 species have been recorded across the survey area, with the majority being either rowan or hawthorn. The other species recorded were found in low numbers, including birch, willow, blackthorn, holly, oak, hazel, beech, alder and sycamore. Around half of the trees were recorded growing in groups of similar trees.

4.1.5 Further information on the results recorded for each of these commons, including a series of charts and maps, is provided in an individual survey report for each common. The raw data are also available as an Excel spreadsheet for each common, together with QGIS shapefiles and photographs of each individual tree and/or group of trees and notable features.

4.1.6 The surveys showed that Harford and Ugborough Moors had the lowest number of trees per hectare (0.8 trees/ha), followed by Walkhampton Common (1.4 trees/ha). In comparison, the interim figure for the number of trees per hectare on Holne Moor (4.4 trees/ha, based on the trees recorded to date) is three times higher than Walkhampton Common and over five times higher than Harford and Ugborough Moors; a final figure for Holne Moor will be reported on completion of the survey there in the summer of 2024.

4.2 Project Evaluation

Survey of Trees on Common Land

4.2.1 The survey approach developed for the Dartmoor Healthy Trees for Tomorrow Survey is considered to have provided very useful baseline data for the commons studied. This formed part of a citizen science project engaging local communities with these commons and acted as a trial for finding a balance between covering large areas of ground and gathering data that are as accurate as possible, whilst being achievable as a citizen science survey in a relatively short window of time. It is important that the data are used with caveats reflecting the way in which the project was undertaken, for instance the fact that a central aim was to engage volunteers to undertake the survey work rather than arboriculturists, but the vast amount of information gathered paints a useful picture about open-grown trees on commons. The survey methods were not intended to be statistically robust and it is accepted that there will be a margin of error with the results. However, despite this, these results provide an incredibly useful insight into the tree populations across wide areas of Dartmoor.

4.2.2 The use of electronic recording, via mobile phones carried by each surveyor, for inputting survey data was highly successful. The recording form was designed specifically for this survey methodology and enabled geo-referencing of each tree or group of trees recorded, thereby reducing the risk of recorder error as far as possible. The form was designed to be used in the field, taking automatic GPS references for each survey point and recording key pieces of information for each tree, as well as at least one photograph; the form could be used off-line and would store data for automatic uploading once back in signal. The parameters of the survey form meant that it could not be submitted until all data had been input.

4.2.3 Several different approaches to covering these commons were tested. It is considered that the approach adopted for Walkhampton Common during 2023 was much the best way to undertake this type of survey. Overall, the supported survey days produced the best results for the project as well as for the volunteers, for instance through enabling a more consistent survey across the different patches, ensuring the project team were on hand to answer questions immediately and enabling a thorough survey across all patches. Whilst the transect method adopted for the Holne Moor survey enabled extrapolation of results for the common, it was felt by all involved that it was much more useful to gain extra survey data in line with the original methodology, and this will be completed in 2024.

4.2.4 If the survey is to be repeated in future, it may be helpful to revisit the balance between accuracy/ coverage and budget/time available. For instance, with regard to assessing ground conditions and level of browsing, these factors were qualitative and subjective. Accounting for this in future surveys would provide a more robust data set and allow additional analysis to be undertaken, although this would almost certainly be more time consuming to gather and may increase cost or reduce coverage. Some

possible refinements may include, for example, providing a series of set options for sapling growing conditions rather than free text. In addition, it would be useful to find a way to map all trees within groups so that the full set of data points are visible.

4.2.5 The survey showed that each of the commons studied was different in terms of its population of open-grown trees. Because of this it would be useful to survey other commons in this way, as it would be difficult to accurately extrapolate the results to other areas. Extending the survey in future to cover additional commons on Dartmoor, or further afield, is therefore considered to be a useful exercise.

4.2.6 In summary, the data recorded through the Dartmoor Healthy Trees for Tomorrow Survey have helped to build up a picture of the open grown trees present across the commons involved in this project: Harford and Ugborough Moors, Walkhampton Common and Holne Moor. These data will form a baseline for assessing change over time and will be useful for informing future management decisions. Repeating, and potentially extending, this survey in future, perhaps at intervals of 10-15 years, would help to build up a picture of change in tree cover across these moorlands over time. Partial repeat surveys could be conducted in a more targeted way more frequently, for instance assessing any change to the small saplings recorded over a shorter timescale.

Increasing Tree Cover

4.2.7 Changes in the project timeframes have meant that works to increase tree cover did not happen on the ground as initially expected. The time-limited nature of this project means that it has been better suited to undertaking the surveys, following a process of designing the methodology and undertaking volunteer recruitment and training, before then providing the results to relevant stakeholders and discussing initial ideas for increasing tree cover.

4.2.8 The small-scale trial of protecting individual scattered regeneration on Ugborough Moor has shown that the use of cactus guards is not suitable for volunteers, due to health and safety concerns, which in turn increases the associated costs. It is possible that this could be achieved in a more cost-effective way by using a combined approach of volunteers marking the saplings to be protected, adding mulch and stakes if necessary, for contractors to later add the guards. There are also ongoing health and safety concerns with these guards and responsibility for these has been taken on by the landowner. In terms of tree planting, the additional consultation required has meant this has not been achieved during the project timeframe, but will be delivered by the Dartmoor Headwaters Project after the end of this project. A model that might be used for planting of scattered trees has recently been carried out on moorlands within Exmoor National Park, whereby contractors marked out the desired locations for planting, with volunteers then planting, mulching and staking the trees, and contractors later adding steel mesh guards.

4.2.9 Any proposals for an increase in tree cover in such areas need to be developed with landowners and commoners, as well as other stakeholders including DNPA and Natural England, as it is important to carefully consider issues such as whether areas proposed as potentially being appropriate for increasing tree cover are of existing value. These stakeholders may therefore be in a better position to agree and take forward ideas for increasing tree cover, for instance as part of the ongoing agri-environment schemes for these commons.

4.2.10 Areas of common land within Dartmoor National Park typically have many associated constraints and the importance and time required for the stakeholder consultation process should not be underestimated. These commons are farmed landscapes and any increase in tree cover needs to work in this context. The majority of commons lie within areas of high significance in terms of their landscape, archaeological, nature conservation or other value, often reflected by a variety of designations including Premier Archaeological Landscape (PAL), Scheduled Ancient Monument (SAM), Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI). Sufficient lead-in time should be allowed for agreeing options with reference to any constraints, for instance ecological, archaeological or agricultural, to which an increase in tree cover would be detrimental.

Tree planting plot on Walkhampton Common

Tree regeneration plot on Harford Moor

4.2.11 The aim would be that increasing tree cover in certain areas would provide numerous benefits in terms of natural capital and ecosystem services, and would need to be complementary in terms of land use and existing features of importance. The survey has shown that in certain areas there is already considerable natural regeneration taking place. Working with nature through encouraging natural regeneration, in appropriate locations, rather than importing trees, means environmental good practice can be followed and is the primary recommendation. The costs associated with encouraging natural regeneration are significantly lower compared to planting and the trees are suited to the current growing conditions in which they are found. However, this does not account for future changes in climatic conditions. By focussing on natural regeneration and direct seed dispersal, biosecurity can be maximised. Where little

regeneration is happening naturally, plants may need to be bought in, ideally using locally grown whips sourced from local nurseries, in order both to reduce costs and to improve biosecurity.

4.2.12 A variety of consents may also be needed, for instance, registering with the Rural Payments Agency any change to non-agricultural land or seeking consent from the Planning Inspectorate on behalf of the Secretary of State for Environment, Food and Rural Affairs to carry out any works that would prevent or impede access to common land, such as fencing. In certain circumstances, where the aim is nature conservation, it is understood that it may not be necessary to seek consent for temporary fencing of moorland areas for up to five years.

4.2.13 The management objectives and opportunities of any increased tree cover need to be considered beyond the small-scale trial plan which formed part of the current project. Management approaches will need to have overarching objectives which could include:

- Ensuring continued widespread and dispersed tree cover on commons, particularly hawthorn;
- Connecting or extending existing areas of trees along rivers;
- Creating connectivity between established woodlands to create an ecological corridor that will contribute to soil health and, in the long-term, allow for natural genetic diversity to be increased in the tree cover;
- Creating an environment of montane scrub that could include widely dispersed trees leading down in altitude to scrub and further down into river valleys of ribbons of willow/alder and oak woodlands;
- Investigating how tree cover can work with and enhance grazing potential on the moor.

4.2.14 In summary, in terms of increasing tree cover on common land, where there are such a diverse range of interests at play, if significant change is to be achieved it is recommended that there will need to be a respected stakeholder organisation leading it, such as DNPA, RSPB, or commoners' associations, with a good amount of time set aside for consultations. This will need to include a series of face-to-face stakeholder meetings and an agreed process for deciding how to make the final decisions. As an example, the Dartmoor Headwaters Project seemed ideally placed to bring everyone together for Harford and Ugborough Moors, although it is understood that project does not cover all commons within the national park. A longer-term project led by an organisation such as Dartmoor National Park Authority or the Foundation for Common Land may be better placed to drive this work forward if desired.

5.0 CONCLUSIONS

5.1 A survey of open grown trees on several Dartmoor commons has been carried out by volunteers, led by Corylus Ecology and Evolving Forests, covering Harford and Ugborough Moors, Walkhampton Common, and Holne Moor during the summers of 2022 and 2023. The survey of Holne Moor will be completed during 2024. The survey methodology was designed in consultation with Dartmoor National Park Authority and the Foundation for Common Land, and refined following consultation with Dartmoor commoners.

5.2 The aim of this work was to better understand the number, age, distribution and health of individual trees on commons and to inform two tree planting trial projects on Dartmoor. An additional outcome was a trial of different approaches to this type of citizen science survey, which tested different methods for recording trees with volunteers on Dartmoor. The survey recorded a total of 7,020 trees, equivalent to 0.8 trees/ha on Harford and Ugborough Moors, 1.4 trees/ha on Walkhampton Common, and 4.4 trees/ha (to date) on Holne Moor.

5.3 The Dartmoor Healthy Trees for Tomorrow Survey has provided an excellent mechanism for surveying large areas of land, with associated caveats for non-scientific results, and for putting forward ideas which can be discussed with stakeholders and then refined and taken forwards by others. It is considered that this type of project can have a role in trialling small-scale changes, but that it may be best to keep the survey itself and the potential increase in tree cover that may follow on from the survey as two distinct elements. This may be achieved by different organisations working together.

5.4 The project was funded thanks to the Our Upland Commons Project, with additional funding made available by the Dartmoor Headwaters Project and the Environment Agency. Led by the Foundation for Common Land, Our Upland Commons has been made possible by grants from The National Lottery Heritage Fund, Esmée Fairbairn, Garfield Weston Foundations plus local funders Dartmoor National Park Authority, Devon Wildlife Trust and Dartmoor Preservation Association.

5.5 It is recommended that, if possible, additional areas are considered for future surveying, particularly to the north of the national park where the landform and environmental conditions differ, as this would give a fuller picture of the state of trees on the moor and allow a more complete analysis of future potential. In addition, repeating this survey in future, perhaps at intervals of 10-15 years or more frequently, would help to build up a picture of change in tree cover across these moorlands over time.

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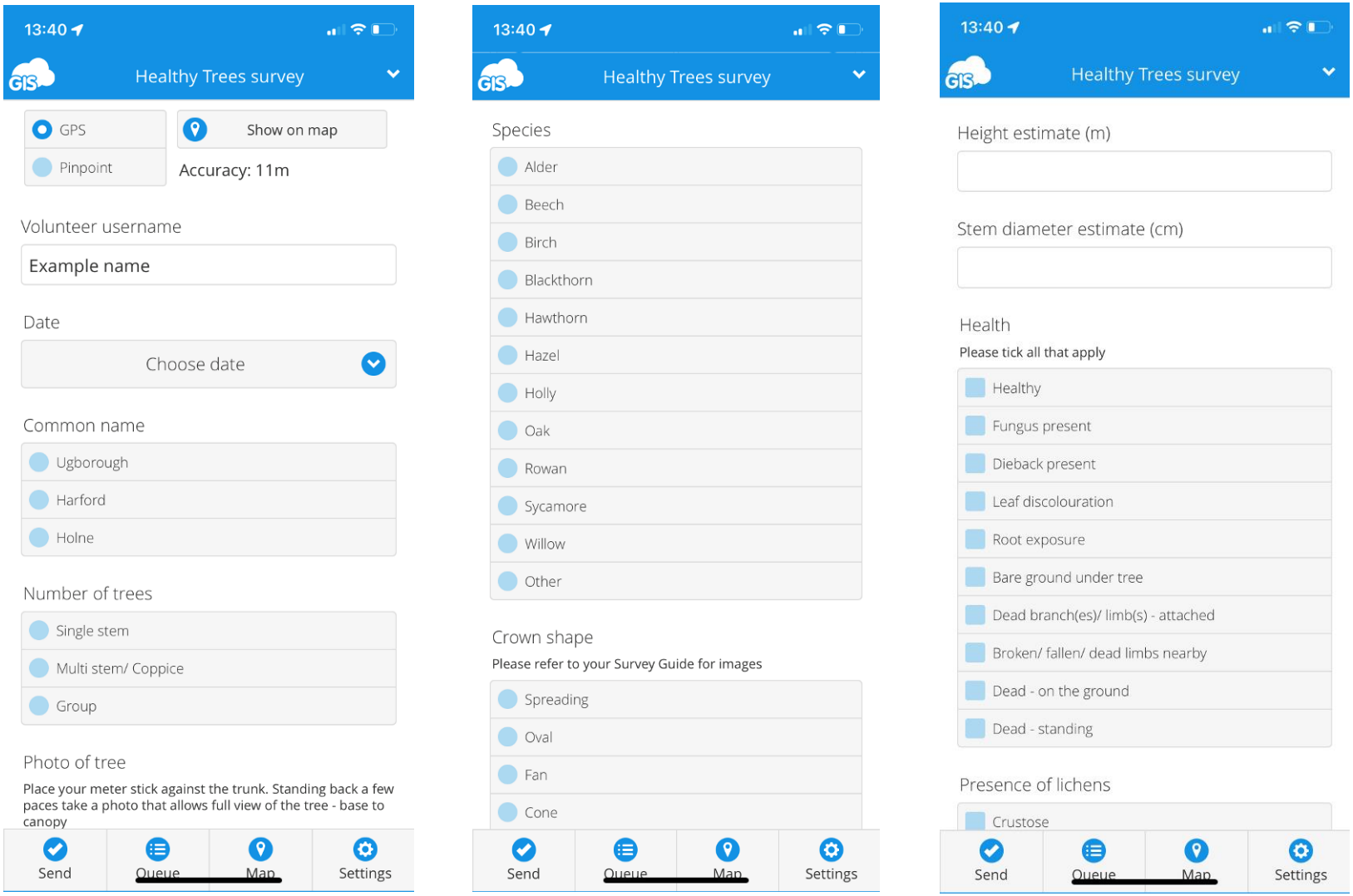
APPENDICES

Appendix 1 – Survey Form



Appendix 2 – Examples of Areas on Dartmoor with Increased Tree Cover (natural or planted)

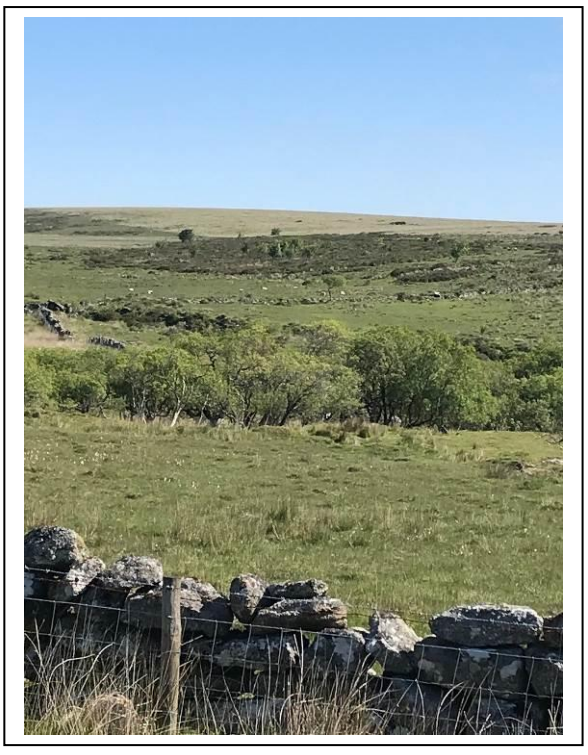
Some areas of interest seen on Dartmoor with increased natural or planted trees that may provide evidence or examples for future planting plans.

1. Chinaclay works, Cadover Bridge

Multiple areas of extensive new planting in fenced exclosures of roughly 1-3 ha each. Mixed broadleaves. Too extensive an area for this project but the size and density of planting may give some environmental protection and enhance early-stage growth.

2. Powdermills, area above old works

Naturally regenerated (or possibly planted for the works) dense woodland in hollow progressing through lighter scrub to open moor. A possible small-scale model of a natural woodland thinning with altitude.

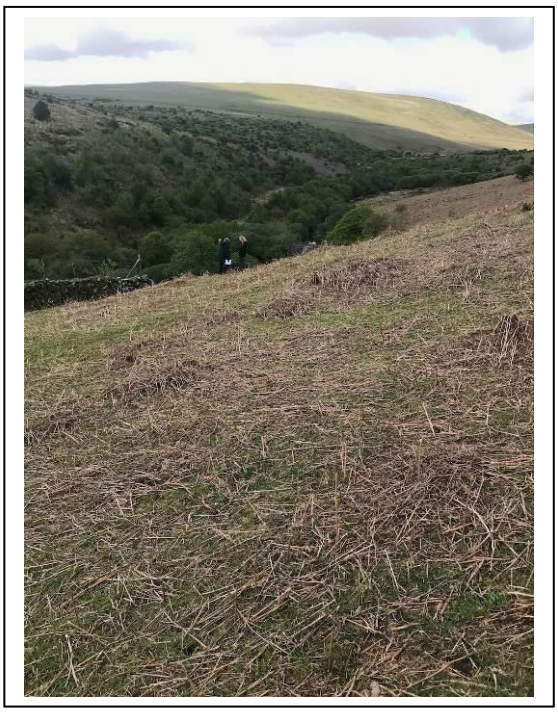


3. Bench Tor

In the survey area of Holne Moor. Dense woodland in steep stream bed giving way to montane scrub and open moor.

4. Burford Down, Erme Valley

Natural regeneration in large excluded area showing the likely natural progression of scrub and woodland, all be it on an east facing valley side.



5. Sherberton Common

New planting in tubes, no fencing, some dead hedging with gorse. Planted without fencing, would be a good area for monitoring success as a model of cost-effective planting within a grazed area.

6. Piles Copse

Very successful new planting as individual trees in “cactus” guards and excluded fenced areas. Some trees grown from seed originating in Piles Copse, others bought in from Moor Trees.

7. Small fenced exclosures, Harford

Experimental exclosures now c. 5-10 years old. Very little growth. The lack of growth in these areas could be exposure, soils or planting stock.