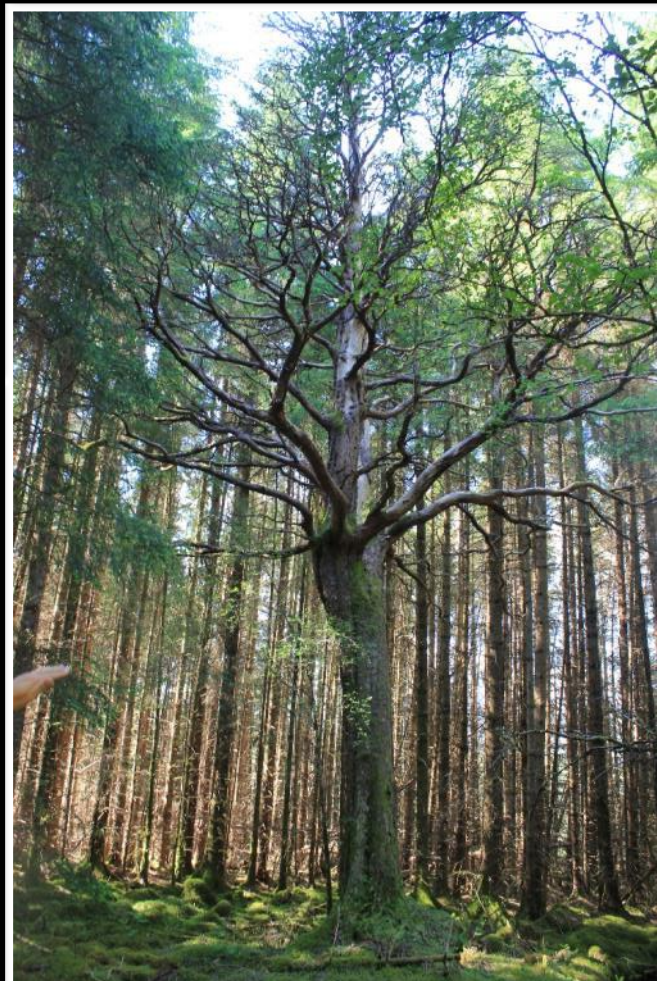


# Loch Arkaig Pine Forest

## Socio-economic baseline report



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# 1 Summary

The aim of this study was to carry out a baseline socio-economic assessment for Loch Arkaig Pine Forest prior to a large scale restoration project. The Loch Arkaig Pine Forest restoration project is a partnership between the Woodland Trust and the local group Arkaig Community Forest (ACF). The aim of project is to restore one of the UK's most significant but degraded Caledonian pinewood to native oak and pinewood. A set of socio-economic indicators was developed using literature sources and refined using a participatory mapping workshop with the Loch Arkaig community. Five categories of indicators were used: economic contribution; community engagement and partnership working; volunteering and skills development; well-being and cultural value; and wider ecosystem services benefits. Socio-economic indicators were assessed using i) community survey ii) business survey and iii) assessment by Woodland Trust. There were 16 responses to the community survey and 19 responses to the business survey. The results of the community survey revealed a high awareness of the forest and restoration plans. The most striking finding was the very high value held for the natural heritage of Loch Arkaig Pine Forest by the respondent group, which was considered of greater importance than recreation and culture. There was some support for business development (tourism, woodfuel, woodlots) but views were mixed. The business respondent group included accommodation providers, activity providers, forest management services and ecological consultancies, the majority of whom had high awareness of the restoration project. In general, Loch Arkaig Pine Forest is not perceived to have significant impacts on the activities and income of the business respondents. However, the restoration project has directly led to the creation of the Arkaig Forestry Co-op which provides a range of ecological and forestry services to the forest. Business respondents generally expected the restoration to have a positive future influence on business in the area and perceived there to be opportunities for developing new business activity including wood products, tourism and ecological services. Information concerning the current economic context for the restoration and ongoing activity was provided by the Woodland Trust and provides a useful baseline and template for monitoring future change. Monitoring of the interactions with both formal partners and other organisations and businesses with an interest in the restoration project was recognised as an important task for the Woodland Trust. The quality of communication and engagement in relation to the restoration is perceived to be high as shown by the high levels of awareness and interest in the project. There was a clear tension between aspirations to improve access and recreational use of the forest and a desire to preserve its wild and remote character, as shown by all data sources in this study. Concerns were expressed over how increased visitor numbers could impact the area. A number of recommendations are made in order to enhance the socio-economic outcomes of the Loch Arkaig Pine Forest Restoration. It is suggested that community responses should be captured following key stages of the restoration and later in the project linked specifically to ecological change in the forest. A stakeholder analysis to monitor relationships with key partners and stakeholders should be conducted by Woodland Trust at regular intervals. There are a range of measures suggested for future community and public engagement including training programmes, engagement with educational institutions and use of digital media.

## 2 Introduction

### 2.1 Project aim

This report presents the results of the Woodland Trust funded project ‘Loch Arkaig Baseline socio-economic study’. The aim of the project was to design and carry out a baseline socio-economic assessment of Loch Arkaig Pine Forest prior to the planned restoration of ancient woodland in the area. The report explains the process of developing and testing a set of socio-economic indicators so that they can be used to evaluate the impacts of the restoration as it progresses. Collecting baseline data using a scientifically rigorous approach will allow the Loch Arkaig Pine Forest project to demonstrate measurable impacts of the restoration work over time. Demonstrating evidence for the benefits of restored ecosystems for communities and the wider public will be valuable for developing and supporting future landscape-scale habitat restoration initiatives. The study had the following objectives:

- 1) Develop a robust and practical set of indicators to use in baseline study.
- 2) Engage with community and businesses at Loch Arkaig to design baseline assessment that reflects local priorities and concerns.
- 3) Test indicators through baseline socio-economic assessment and provide advice on future monitoring to the Woodland Trust.

### 2.2 Background

#### Loch Arkaig Restoration

The Loch Arkaig Pine Forest restoration project is a partnership between the Woodland Trust and the local group Arkaig Community Forest (ACF). The aim of project is to restore one of the UK’s most significant but degraded Caledonian pinewood to native oak and pinewood. The 1,096 hectare area of forest on the south shores of Loch Arkaig was bought by ACF in partnership with the Woodland Trust in 2016. The acquisition from Forestry Commission Scotland was planned with a view to restore the pinewood, provide the community with economic benefits from the timber resource and create local employment opportunities in forest management. Forest management activity prior to the acquisition included the removal of non-native conifers and deer control measures. ACF and the Woodland Trust collaboratively manage the site. ACF own 5% and the Woodland Trust own 95%. The partnership has a shared aim of restoring and expanding the native woodland habitats to bring ecological, economic and social benefits to the area, and reconnect people with the land. The restoration will involve the extraction of about 75,000 tonnes of timber from non-native trees which will require substantially upgraded access infrastructure. There will be considerable focus placed upon developing positive working relationships with neighbouring landowners, land managers and the local community to work towards achieving economic and social benefits from the project. There will also be work to provide interpretation and information for both actual and virtual visitors to raise awareness of the restoration, local history and the biodiversity of Loch Arkaig Pine Forest.

#### Ecological restoration

There are several examples of large-scale ecological restoration projects ongoing in Scotland e.g. Abernethy, Sunart oakwoods and Invereshie/Inshriach. Considerable ecological change has taken place in these areas, but this has not been accompanied by long-term socio-economic monitoring. The Loch Arkaig Pine Forest restoration project represents a valuable opportunity to understand a rich range of social and economic factors within the restoration of an intact and functioning ecosystem that has the potential to support a rich diversity of valuable and iconic native species. This project offers a rare opportunity to collect baseline data and carry out monitoring over a long-term period

using a scientifically rigorous approach, with the potential to be a valuable demonstration project for wider ecological restoration in Scotland and beyond. There have been few studies that have assessed socio-economic impacts of restoration after implementation; research has focused mainly on ecological change. The socio-economic studies carried out have tended to consider community attitudes towards future restoration and the potential economic value of initiatives (e.g. Wortley et al. 2013), and there is a clear need for more research that demonstrates actual socio-economic outcomes of restoration.

### Socio-economic benefits of woodland

Native woodland is recognised as an important natural asset that provides significant cultural, regulating and provisioning ecosystem services (Quine et al. 2011). The main benefits are shown in Table 1. Ecosystem services are a useful concept for understanding the range of benefits that ecosystems provide to users and other beneficiaries. Beneficiaries may include communities, recreational users, and the wider public.

**TABLE 1 - ECOSYSTEM SERVICES FROM WOODLANDS (QUINE ET AL. 2011)**

<b>Ecosystem Service</b>	<b>Benefits</b>
<b>Cultural</b>	Recreation, health, wild species diversity, historical significance, education and skills
<b>Regulating</b>	Flood reduction, water quality, carbon sequestration, pest and disease resilience
<b>Provisioning</b>	Timber production, fuelwood, Non-timber forest products
<b>Supporting</b>	Biodiversity and habitat value

There is considerable evidence of the social, economic and cultural value of trees and woodland (Edwards et al. 2009). The economic contribution of woodland includes direct employment in woodland management, the value of timber and other products, the use of services and suppliers and the woodland-associated spending by visitors. In monetary terms, a study assessed the total economic value of UK woodlands to be around £270bn (Europe Economics, 2015). This included a quantification of direct economic value through production and land value but also quantification of regulating ecosystem services and cultural values. Woodlands therefore have diverse and significant economic value and this is considered in the design and implementation of policies such as the Scottish Land Use Strategy (Scottish Government, 2016) and the Scottish Forestry Strategy (Scottish Executive 2006; Scottish Government 2019). The Scottish Biodiversity Strategy (Scottish Executive, 2004; The Scottish Government 2013) emphasises the importance of fully functioning ecosystems that underpin the local and national economy across rural and urban areas in addition to the broader social and cultural benefits of biodiversity.

Recreational use of woodlands by communities and visitors contributes to their social value and has a range of benefits for physical and mental health, learning and education, and existence value (the importance of knowing that forests exist for current and future generations; Edwards et al. 2009).

People associate a wide range of cultural values with native woodlands, including their importance in providing a sense of place, their aesthetic and spiritual value, and their historical significance, which may include visible historical remains and intangible aspects such as stories and myths.

As well as the direct benefits experienced from the presence of native woodland, there are a range of associated benefits that can stem from people's involvement in the management and improvement of their local woodlands. These can range from the satisfaction experienced by volunteers who take part in tree planting schemes to being involved in the management of a community-owned woodland and associated individual and community empowerment, or by contributing to woodland monitoring as a citizen scientist (Lawrence and Ambrose-Oji, 2015).

### **Woodland management**

Key woodland habitats in the Lochaber area include Atlantic oakwood, upland birch woods, native pinewood, lowland blanket bog, lowland fens and upland heath (Forestry Commission Scotland, 2007). As in much of upland Scotland, there have been marked declines in native mixed woodland in the west of the country (Forestry Commission Scotland, 2008). Research carried out in 2015 identified the combination of low grade coniferous timber, as well as inconsistency of quality and supply of wood products, as an impediment to local sustainable forestry development (Donaldson Environmental Consultancy & Stephens, 2015). Oakwoods pose a promising opportunity for continuous cover forestry and producing a sustainable supply of hardwood timber in the region as broadleaves, such as birch and oak are often underestimated as productive trees (Thomas et al. 2015; Zeltinš et al. 2018; Scottish Government 2019). However, many of these areas are designated as SSSIs and SACs, and any forest operations could impact the light regime, affecting the distribution of nesting birds, and moisture sensitive moss and lichens, thereby affecting biodiversity (Wilson, 2014). Traditionally, the oakwoods made up a culturally significant coppicing system along with mixed hazel woods that provided communities with a fuel resource. Industrial coppicing took place between mid 18<sup>th</sup> to late 19<sup>th</sup> century, current native woodlands are the relicts of this activity (Quelch, 2005). As part of a Caledonian pinewood restoration, mixed areas of native broadleaf woodland structures would be beneficial for biodiversity, potential community use and for forest resilience through diverse forest structures and species that could reduce the risk of threats such as disease, pests and pathogens to forest health (Forestry Commission Scotland, 2016). The capacity to adapt and respond to forest health issues at a local level is becoming increasingly important for Scottish forestry, future biodiversity and communities that use forest resources.

Restoration of Caledonian pinewoods requires adaptive approaches with mixed silviculture regimes that favour selective harvesting and continuous cover forestry creating a diverse connected mosaic. Development of these regimes requires monitoring, evaluation and adaptive planning to ensure success and continued learning from the project. These successes will be mostly evaluated by the users and consumers of the forest and potentially biodiversity metrics in regional Biodiversity Action Plans (BAP). As restoration of the Caledonian pinewoods is an importance priority for Scottish forest resilience, long-term monitoring and adaptive management approaches could provide valuable data for future projects.

## **3 Development of socio-economic indicators**

The socio-economic impacts of the Loch Arkaig Pine Forest restoration project will depend on the specific activities carried out during the programme. A range of forestry operations and activities will be conducted as part of the restoration project. To help guide the development of these activities, the socio-economic information collected should include an understanding of the relative importance of



different socio-economic factors for the affected community. It is important to demonstrate the benefits of the ecological restoration of the forest to be able to fully understand and communicate the impacts of the ecological change that occurs over the restoration period. The challenge of addressing this aspect of the work is the long timescale involved. There is likely to be a range of socio-economic benefits experienced by the community and other stakeholders in the early years of the project e.g. improved access infrastructure, timber revenue, the opportunities for community involvement with ecological monitoring and restoration planning etc. However, the ecological benefits associated with improving the quality of the forest and restoration of native biodiversity will not be fully realised for a number of years.

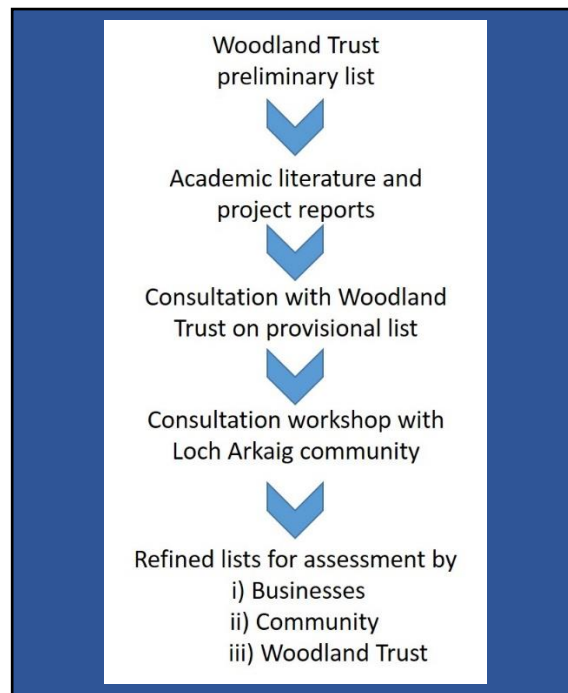
The socio-economic study must therefore account for the different timescales of impacts and be structured in such a way that monitoring is relevant to the stage of the restoration process. There may also be some negative impacts due to the development of infrastructure in the area; some of which may be temporary before associated benefits are experienced. A further consideration is how measures can be developed to capture impacts caused by the forest restoration itself, and not the impacts of activities that could be carried on in the forest in its current state. With these points in mind, measures developed were based on three types of data:

- i. existing data that could be collated and analysed using desk-based approaches;
- ii. data collected directly from stakeholders and community through a survey methodology; and
- iii. self-assessment of socio-economic impacts completed by those directly involved in the restoration management.

The development of the socio-economic indicators for the baseline study followed the steps shown in Figure 1. Prior to this study, the Woodland Trust had developed a preliminary list of potential benefits that they expected could result from the forest restoration. This was used as a starting point for the development of a more extensive long-list based on academic literature and project reports. There are frameworks and indicators that have been developed specifically for valuing the social and economic benefits of forests and woodland in Scotland so there was a particular focus on these during the indicator development process. The Ecosystem Services framework. (Körner et al. 2005; UK NEA 2014) provides an important overview of the benefits of ecosystem services to society. The Woodlands chapter of the National Ecosystem Assessment (Quine et al. 2011) was used to collate a general list of benefits that society derives from woodland habitats. The report conducted for Forestry Commission Scotland by Edwards et al. (2009) developed a typology of socio-economic themes of direct relevance to Scottish forest and woodlands categorised by the following themes:

1. Employment and volunteering
2. Contribution to the economy
3. Recreation and accessibility
4. Learning and education
5. Health and well-being
6. Culture and landscape
7. Community capacity

Indicators were developed under each theme and these were used to ensure that the socio-economic impact of the restoration project were captured for different stakeholder groups including community members, businesses, recreational users, volunteers and visitors.



**FIGURE 1** - PROCESS FOR DEVELOPING SOCIO-ECONOMIC INDICATORS

The long-list of socio-economic measures developed is shown in Table 2. This shows type of impact, theme, indicators and planned data source for assessment. Five main socio-economic categories include: Economic contribution; Community engagement and partnership working; Volunteering and skills development; Well-being and cultural value; and Wider ecosystem services benefits).

**TABLE 2** - LONG-LIST OF SOCIO-ECONOMIC MEASURES

Type of impact	Theme	Indicator(s)	Data source
<b>1. Economic contribution</b>			
Employment (local and other)	Woodland Trust staff	Proportion of WT staff time (FTE)	WT
		Value of WT staff time (£)	WT
		Proportion of time spent on different activities (e.g. environmental, community engagement)	WT
		Number of employees related to Non Timber Forest Products activity (e.g. food, material harvesting)	WT
	Contractors	Number of contractors	WT
		Value of contracts (£)	WT
		Location of suppliers (local/regional/national)	WT Business survey
Economic sustainability of restoration model	Site income and expenditure	Income from site activities (£) (excl. timber)	WT
		Expenditure on site activities	WT
	Timber products	Value of timber products (£)	WT Business survey
		Value of timber products to local market (£)	WT Business survey
		Value of timber products to wider market (£)	WT Business survey

Type of impact	Theme	Indicator(s)	Data source
	Grants/funding	Grant value (£)	WT
		Financial support for community involvement (£)	WT Community survey
Local business revenue	Spend related to restoration	Value of spend with local suppliers	WT Business survey
		Regularity of spend with local suppliers	WT Business survey
		Use of local businesses by employees/contractors related to Loch Arkaig Pine Forest	WT Business survey
		Proportion of (perceived) business turnover related to Loch Arkaig Pine Forest	WT Business survey
	Spend related to visitors to Loch Arkaig Pine Forest	(Perceptions of) use of local businesses by visitors to Loch Arkaig Pine Forest	WT Business survey
		Number of tourism businesses using Loch Arkaig Pine Forest	WT Business survey
		Number of business start-ups (e.g. new tourism initiatives)	Business survey
2. Community engagement and partnership working			
Community engagement	Organisations and/or community groups involved formally in restoration	Number of organisations/groups formally involved	WT
		Extent of involvement of each group (notable activities and achievements)	WT Community survey
	Community engagement in forest plans	Number of people participating (e.g. through correspondence, meetings)	Community survey
		Demographics of community members involved	Community survey
		Number of people aware of restoration	Community survey
		Reasons of lack of engagement or interest	Community survey
Partnership working	Engagement in landscape partnerships	Number of partnerships	WT
		Aims of partnerships	WT
	Extent of interaction with external stakeholders	Number of formal interactions (e.g. other restoration projects)	WT
		Partnerships to mitigate potential negative impacts (e.g. deer, fish farming)	WT
3. Volunteering and skills development			
Training and educational opportunities	Forestry management/monitoring training	Number of local community members trained in forestry monitoring methods	WT Community survey
		Uptake of WT apprenticeships	WT Community survey
	Programmes for young people	Number of initiatives for schools and/or other youth groups	WT Community survey

Type of impact	Theme	Indicator(s)	Data source
		Number of participants (local)	WT Community survey
		Number of participants (regional)	WT Community survey
		Number of return visits (schools)	WT Community survey
Volunteering opportunities	Involvement in restoration	Number of local community members involved in forestry monitoring	WT Community survey
		Number of volunteering opportunities	WT Community survey
		Number of people taking part in conservation activities	WT Community survey
		Number of volunteer days	WT Community survey
	Volunteer reach and motivation	Distance travelled by volunteers	WT Community survey
		Motivations for volunteering	Community survey
		Number of repeat volunteers	Community survey
4. Wellbeing and cultural value			
Use of Loch Arkaig Pine Forest	Diversity of uses and users	Regularity of access and recreational use of Loch Arkaig Pine Forest by local community	Community Survey
		Number of visitors	WT Community survey
		Reasons for visiting Loch Arkaig Pine Forest	Community Survey
	Wellbeing benefits	Benefits from forest use (select from list, including existential values)	Community survey
	Enhanced infrastructure	New paths/tracks (km)	WT
Protection and enhancement of cultural heritage	Awareness and use of sites with cultural importance	Number of sites of cultural importance	WT Community survey
		Spend related to sites (e.g. interpretation, maintenance)	WT Community survey
	Forest history and culture	Awareness of forest history	Community survey
		Interest in forest history	Community survey
		Initiatives that draw on forest history/cultural heritage	Community survey
		Number of forest-based cultural events and activities	Community survey

Type of impact	Theme	Indicator(s)	Data source
<b>5. Wider ecosystem services benefits</b>			
Wild species diversity	Awareness of ecosystems, species and their condition	Awareness of presences of species (e.g. osprey, golden eagle, etc.)	Community survey
		Observation of species (above) in most recent visit	Community survey
		Number of visitors to view ospreys	WT Community survey
		Number of online visitors to osprey webcam	WT
Resilience to pests, disease and non-native species	Forest health	Observation of tree disease (e.g. dothistroma needle blight)	WT Community survey
		Observation of non-native tree species (e.g. lodgepole pine, sitka spruce, etc.)	WT Community survey
Benefits from provisioning services	Opportunities for community woodfuel and woodlots	Number of woodfuel and woodlot opportunities	WT
		Community attitude towards woodfuel and woodlot opportunities	Community survey
		Uptake of woodfuel and woodlot opportunities	WT Community survey
	Non-timber forest products	Use of non-timber forest products e.g. venison, foraging	WT Community Survey

## 4 Community workshop

### 4.1 Workshop methodology and map development

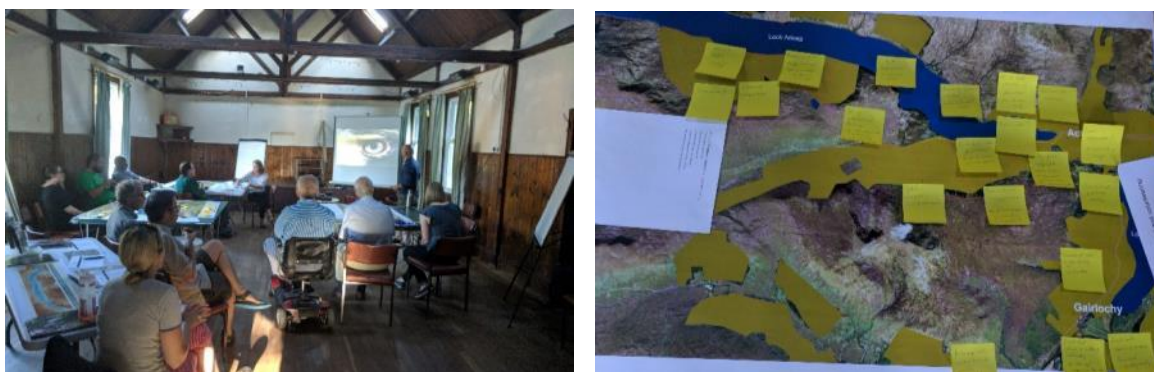
A community workshop with local residents of the Arkaig area was developed to capture unique local insights and knowledge of the Arkaig environment. The workshop focused on the following three themes:

1. Economic impacts of restoration
2. Community engagement and volunteering
3. Natural and cultural value

People's knowledge of and connection to the landscape was explored using large maps of the Arkaig area and forest blocks undergoing restoration to identify and pinpoint specific areas that relate to the above themes with the aim of identifying key developments or resources. Members of Arkaig Community Forest (ACF) and the Achnacarry, Burnarkaig and Clunes community group were invited through contacts in the Woodland Trust and key community group representatives.

On 27<sup>th</sup> June 2018, the Achnacarry village Hall was set up with information stations about the restoration project, and maps were displayed for community members to drop-in and ask questions about the project, provide feedback and comment on the maps. This provided the opportunity for a diverse range of stakeholders to communicate their views throughout the day. However, the majority of participants (14) arrived around 18.00 where upon a presentation about the purpose of the evening and the wider study was provided by the study team.





**FIGURE 2** - WORKSHOP SET-UP AND OSPREY PRESENTATION (L) AND ANNOTATED MAP (R)

The participants were split into equal groups around the three map stations with post it notes, sticky dots and pens available for participants to mark or draw on the maps. The study team facilitated the discussion of broad issues relevant to each theme and managed the interactions between the participants. Each map station was based on one of the three themes: economic impacts of the restoration; community engagement and volunteering; and natural and cultural value.

Discussion of each theme lasted 15 minutes and then the groups rotated to the next station – the whole mapping exercise lasted approximately one hour. Participants were encouraged to discuss the individual themes with regard to their personal knowledge, aspirations and concerns or current experience. Each group had a diverse range of community representatives with various interests. The facilitators encouraged participation from all involved and steered the discussion toward relevant subjects when appropriate. Written notes were made by the study team to capture the conversations and aid and substantiate points of discussion. Where possible, key points were noted on Post-it notes and added to the relevant location on the large maps to capture spatially-relevant points.

After the mapping exercise, the facilitators gathered up the materials and recorded their observations while the participants enjoyed refreshments and a presentation about the nesting ospreys of Loch Arkaig.

## 4.2 Outcomes of workshop

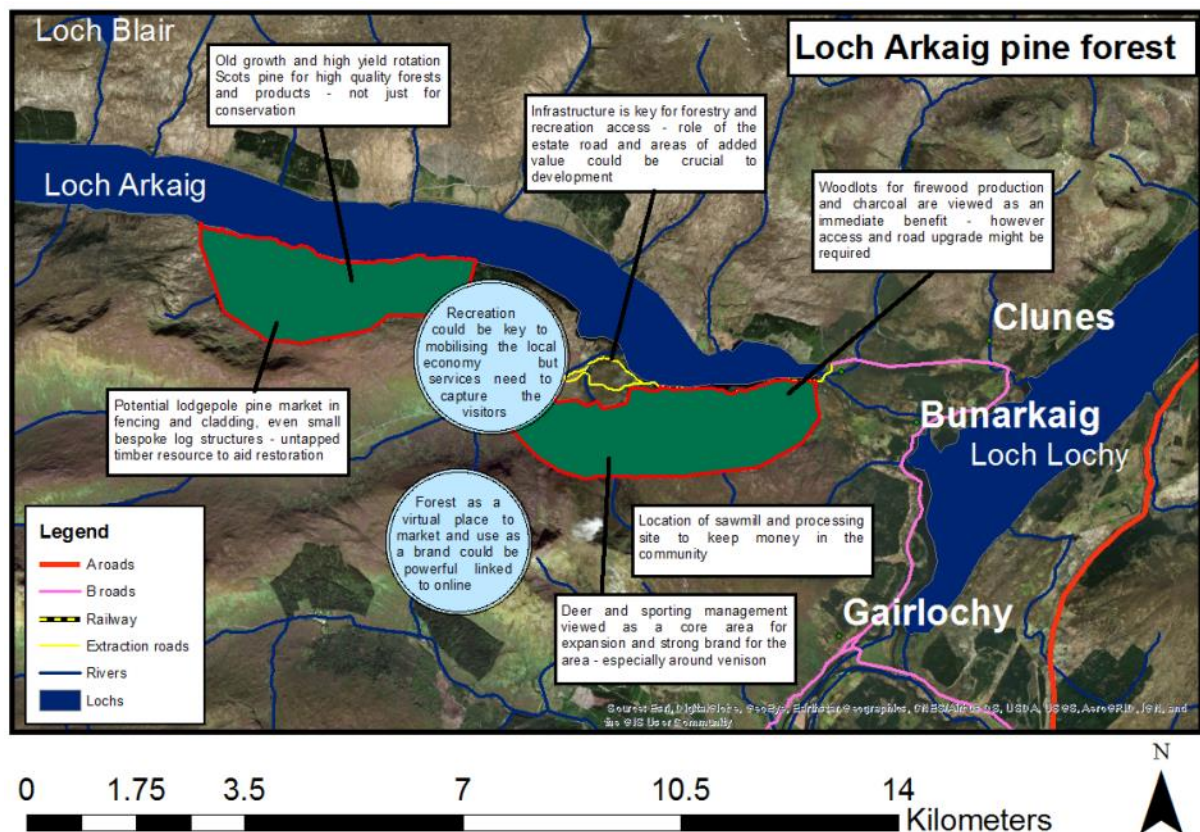
This section summarises the discussions that took place during the workshop. Each mapping station produced a range of results that could be mapped and related to the overarching themes described in [Section 4.1](#) (e.g. economic impacts). An annotated map (Figure 2) was created for the economic impacts of restoration theme, as spatial points and areas were directly referenced by participants. Thematic tables are used to capture further details and key messages.

### 4.2.1 Economic impacts of restoration

Timber production and infrastructure were identified as key development areas on the Arkaig map, specifically Scots pine (*Pinus sylvestris*) timber for high value products in the north of the Gusach forest, and areas of lodgepole pine (*Pinus contorta*) for cladding and fencing in the south (Figure 3). A milling and processing site near the road at the entrance to the forest before the bridge was identified as one way to keep money in the community by adding value on site. However this would require development of small-scale industry infrastructure, which might clash with residents' desires to keep the area relatively wild. Roads and access for both timber products and woodfuel from potential woodlots was also highlighted as a promising way forward to manage the forest for an economic resource. Maintenance of the current extraction road would be required, as well as a future upgrade to service a sustainable timber product supply. Deer populations were viewed as an important

resource upon which a venison market and enhanced sporting activities could be developed. This also relates to the identity of the forest, as many of the participants saw the historic hunting as the main identity rather than the restoration of the Caledonian pine forest and resulting biodiversity gains.

In general, recreation was the most popular idea for boosting the local economy and providing income for local residents. There were no explicit business ideas targeting specific resources or markets; instead, there was a general sense that the restored forest could be a powerful 'lure' for visitors. Again, this thought process was underpinned by an ambivalent caveat that they did not want to attract too many visitors as they felt that the area should retain its isolated and wild character, which is highly valued by the local residents. Marketing and using the forest as a brand and virtual place was mentioned by one participant; most residents thought of business capacity and creation as something literally connected to physical resource and space.



**FIGURE 3 - WORKSHOP MAP SHOWING ECONOMIC IMPACTS OF RESTORATION**

Timber was the focus of the discussion about economic resources, exploring potential products and timber quality that the forest could produce including lodgepole for fencing, larch (*Larix Europea*) for cladding and birch for firewood were all located on the map. Scots pine will be managed long-term and retained, while non-natives lodgepole, larch and Sitka spruce (*Picea stitchensis*) are likely to be phased-out. Therefore the emphasis on growing high quality Scots pine would require long-term investment and selective silviculture treatments. There was also an 'as and when we need wood' philosophy in place for bespoke timber products, an acknowledgement that the cultivation of quality hardwoods would need active management, and some targeted wood products in mind. The loch shore and other areas of the Arkaig forest are home to small areas of oak that could produce high quality timber.

Infrastructure for timber and woodfuel extraction was also identified as an important development both in the Woodland Trust's and ACF's area of the woodland, as this factor will determine the type of operations and forestry machinery that could be used by the community and ultimately the type of management adopted. These activities could influence the range of timber products produced by the forest and community. However further discussions about timber products management, marketing and ownership would benefit the partnership and inform current decision-making

Participants were eager to explore non-timber forest products (NTFP) – however most NTFPs are viewed as historical management systems that could be reinstated today, for example the charcoal pits, potentially used for biochar as fertilisation and generating cultural practices to showcase. There was no mention of fungi, seeds and traditional ecosystem services such as carbon or water management.

Deer management that worked with appropriate regeneration levels was seen as an important goal for the restoration, which could create an interesting ecologically friendly brand for the venison. Other agroforestry systems with pigs, sheep or cattle were also viewed as providing desirable products and brands to the local area and beyond. Boar is present in the region and is kept by a neighbouring estate; sightings, camera trap images and abundant physical evidence from within the ACF and WT managed areas indicate they are already inhabiting the area so could be part of the management and natural restoration of the forest. Wildlife tours were seen as a key way to use the forest resource, however this might need to be pitched in an original or unique way to compete with all the established wildlife tour operators. Fort William was mentioned briefly in relation to the growth in new local amenities for a wide range of tourists and residents, which could provide a route to market for the ecologically conscious businesses. A summary of potential economic impacts discussed in the workshop is shown in Table 3.

**TABLE 3 - SUMMARY OF POTENTIAL ECONOMIC IMPACTS**

Areas of interest	Potential impact
<b>Timber resource</b>	<ul style="list-style-type: none"> <li>• Lodgepole pine resource to be used for fencing and construction – strong market</li> <li>• Quality Scots pine for high end products</li> <li>• Bespoke timber for bespoke furniture and craftwork</li> <li>• Woodlots for fire wood – birch</li> <li>• Cultivate quality hardwoods</li> <li>• Perception of Scottish timber as inferior this could be changed at Arkaig</li> <li>• Larch for cladding very sought after £400-600/m<sup>3</sup></li> <li>• Increase yield and quality to compete with future demand</li> <li>• Forestry management to production would need stimulus to set right plans and operations in place</li> </ul>
<b>Recreation</b>	<ul style="list-style-type: none"> <li>• Catchment area for walking and biking could have economic benefit with correct marketing</li> </ul>
<b>Wildlife</b>	<ul style="list-style-type: none"> <li>• Large mammals and rare birds are hugely popular could capitalise on wildlife tourism trend</li> </ul>
<b>Businesses</b>	<ul style="list-style-type: none"> <li>• Locals eager to access opportunities add value and maximise profit</li> <li>• Venison market</li> <li>• Local sawmill and staging site for timber products could be situated at the apex of Loch and forest to add value to timber products</li> </ul>
<b>Woodland resource (excluding timber/fibre)</b>	<ul style="list-style-type: none"> <li>• Deer management opportunity managed in tune with regeneration</li> <li>• Charcoal platforms to be restored and used again for traditional practices and heritage</li> <li>• Agroforestry areas (pastoral)</li> <li>• Potential for bespoke, niche products from the forest, using both fibre and NTFPs – attached to the main block of woodland</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>• Road access could be better for sporting uses and wildlife tours – by the estate road</li> <li>• Road could connect to woodlots in the first part of Arkaig forest</li> </ul>
<b>Connectivity</b>	<ul style="list-style-type: none"> <li>• Keep area remote</li> <li>• The renaissance of Fort William wider range of services – Vegan cafes, right people, right mix, is moving forward</li> </ul>

#### 4.2.2 Community engagement and volunteering

A key theme emerging from this group was ‘young people’ and the task of attracting them to the area. Engagement strategies suggested included providing volunteering opportunities to help young people improve professional skillsets and even help them to set-up businesses and stay in the area, which would support business capacity and invite innovative thinking into the community, increasing the overall resilience. In spite of the general will to attract young residents, it was noted fleetingly in group discussions that this may be hindered by the lack of housing (especially affordable housing) that would in turn stimulate the need for local amenities.

Partnerships with outdoor initiatives and learning organisations, as well as higher education institutes and schools, was an attractive prospect for participants. Hosting these visitors and offering an immersive and interactive landscape for learning was seen as a venture that has wide scope for growth. Currently there is no accommodation or central field centre that could accommodate groups – this is a possible future development. Events that highlight the lifecycle or route to market of products from the forest were seen as powerful tools to attract visitors and more specifically educational tours.

In the future, engagement will be driven by the local community and some are already actively involved. A few local residents have been trained in some key rural skills needed for management of the forest – these skills could be passed along to other volunteers, raising the general forestry skill level of the area. New forestry contractors have recently become established in the area, demonstrating the potential for new business generation. Although forestry contracting is a competitive business, it has low profitability and can be difficult to sustain, especially in early years when generating a stable customer base. The Arkaig project could be partially involved in helping to maintain and support locally based contractors, and retaining local forestry expertise.

A ranger or officer to facilitate the engagement of businesses, organisations, educational trips and tourists at the partnership level is viewed as a key role, which will maintain Arkaig as an area of interest and coordinate the services offered. Such a role has been used by numerous community initiatives and partnerships to drive change, attract new funding and mobilise community activity. As highlighted in the economic impacts theme, infrastructure and the subsequent accessibility is an important issue for unlocking areas of the forest to visitors and creating recreational infrastructure. A summary of potential impacts under this theme is shown in Table 4.

**TABLE 4 - SUMMARY OF POTENTIAL IMPACTS ON COMMUNITY ENGAGEMENT AND VOLUNTEERING**

Areas of interest	Potential impact
<b>Facilities</b>	<ul style="list-style-type: none"> <li>• Facilities for volunteers – i.e. where do they stay?</li> <li>• Field centre?</li> <li>• Number of Arkaig forest experiences provided by external operators in the past (e.g. by outside companies)</li> </ul>
<b>Partnerships</b>	<ul style="list-style-type: none"> <li>• Number of visits from other organisations/groups to learn about the project. <ul style="list-style-type: none"> <li>○ This could also include a WTS record of how many students/academics/others approach them for interviews, for example.</li> <li>○ This could also include number of international visitors/exchanges – e.g. ACF visited Finland with LEADER funding.</li> </ul> </li> <li>• Partnerships with outdoor learning providers e.g. Outward Bound Loch Eil. This could include number of Duke of Edinburgh expeditions carried out on loch/in forest.</li> <li>• Links with Mountain Bothy Association</li> </ul>
<b>Young people</b>	<ul style="list-style-type: none"> <li>• Events that change our culture/understanding (particularly young people) e.g. deer management experience days like ‘Hill to Plate’ initiative for kids/Salmon in the classroom</li> <li>• Number of Duke of Edinburgh volunteers from local secondary school – Difficult to engage with local schools need a representative</li> </ul>
<b>Local people</b>	<ul style="list-style-type: none"> <li>• Number of new local forestry contractors – survey location and services for skillset in region</li> <li>• Number of ‘local ambassadors’ to work with a ranger</li> <li>• Presence of an on-the-ground ranger(s) to receive visitors and tell them more about the work (particularly for school groups) – could be measured in number of days ranger is present?</li> <li>• ‘Reach’ in terms of training participants’ – number of local people with new skills (and using them!). Very local currently but this could spread geographically.</li> </ul>
<b>Accessibility</b>	<ul style="list-style-type: none"> <li>• Accessibility improvements over time – vehicular/on foot/on bike – mentioned access to far block in particular.</li> </ul>



#### 4.2.3 Natural and cultural value

Access for tourism and local enjoyment of the forest was a key point, as well as adding interpretation and educational resources for visitors. There are many parts of the forest that are currently unreachable, therefore designing tracks and a path network that can link up different areas of interest could unlock resource and recreation potential. As mentioned in the other two themes, the will to welcome limited tourism and footfall to maintain Arkaig's remote and wild character was an important issue. Biking on forest trails in the Highlands is very popular and the mountain biking community are always seeking new trails to test their skills.

Developing bike trails could bring in more visitors but some design of the tracks and how they interact with other paths will have to be thought through carefully. Bike trails are normally free with only car parks charging money.

Increasingly, forests are linked with well-being and rehabilitation, either for green prescriptions or shinrin yoku (forest bathing) to elevate mood and escape the strain of modern living (ref?). Increasingly, such uses are becoming cornerstones of healthcare, which could benefit local people and be a draw for visitors. Businesses are being established in other forests around the UK using the context of forest bathing, meditation and teaching people to relax, as well as reduce stress levels (a partnership with NHS Highland could be explored). Abriachan Forest Trust close to Inverness successfully runs such schemes (Abriachan Forest Trust 2015).

Features such as a tree-top walk, camping and recreation facilities were mentioned to attract more children and the wider public. Re-introductions of native species such as red squirrel (*Sciurus vulgaris*) and beavers (*Castor fiber*) were seen as positive to the forest's profile and biodiversity. The transition to a mixed native woodland with little commercial activity was also viewed positively, although it was recognised that this may limit direct income from the forest. Some participants thought that filming or web-linking the transitional phases much like the osprey cam may generate interest and further investment in the forest and the restoration process.

The development of woodlots managed by the local community was viewed as an opportunity to involve local residents and gain both monetary and local energy resources from the forest. Woodlots were seen as a starting point to use the forest resource in a productive manner but more detailed and robust plans concerning management and timeframes appeared to be distant to most participants. Thus, there was general positivity concerning the concept but possibly less certainty regarding how such as scheme would work. The majority of the participants acknowledge the intangible benefits of the forest to lifestyle but many residents also admitted to not having visited the forest. A summary of impacts related to this theme is shown in Table 5.

**TABLE 5 - SUMMARY OF POTENTIAL IMPACTS ON NATURAL AND CULTURAL VALUE**

Areas of interest	Potential impact
<b>Access and tourism</b>	<ul style="list-style-type: none"> <li>Increases in visitor numbers should be accompanied by information and interpretation at the site.</li> <li>Forest use will depend upon access provision</li> <li>There is also a need to increase access to different areas of the forest.</li> <li>The community do not want a large increase in visitors/tourism to the area but instead wish to facilitate access to those who have an interest in enjoying the area in a low-impact way</li> <li>There is also recognition that ecotourism can generate income for the community and there is some interest in developing 'wild tours' and educational bush craft initiatives, particularly for young people to experience the forest</li> <li>There is a desire to increase access and use for the community</li> <li>Bike trails were seen by some as a good means of increasing access to the forest</li> </ul>
<b>Potential value</b>	<ul style="list-style-type: none"> <li>The forest provides multiple wellbeing benefits. A priority for some in the area is getting more local people into the forest as it is currently little used.</li> <li>Features could be added that will make the forest more attractive to children: <ul style="list-style-type: none"> <li>Viewing platform to view interesting and unusual trees</li> <li>Tree top walks</li> <li>Mountain bike trails</li> <li>Wild camping sites</li> <li>Eagle hide enhancement</li> <li>Increase in Osprey platforms</li> <li>Potential for multi-day walking routes that pass-through site</li> </ul> </li> </ul>
<b>Habitat</b>	<ul style="list-style-type: none"> <li>Opportunities for reintroducing red squirrels and beavers to the site were discussed</li> <li>There was concern from land managers that the associated disturbance from bikes trails would have negative impacts of deer stalking activities</li> <li>Conversion of commercial to natural woodland could be appreciated by people who follow the progress of the forest virtually e.g. on website, and do not actually visit.</li> </ul>
<b>Local resources</b>	<ul style="list-style-type: none"> <li>There is already local interest in wood fuel and woodlot opportunities. Local businesses are interested in diversifying into woodfuel.</li> <li>It was highlighted that the main benefit to the community is the change from commercial to native woodland and the lifestyle benefits that this brings. Potential economic benefits were considered to be limited.</li> </ul>
<b>Virtual experience</b>	<ul style="list-style-type: none"> <li>Part of the community perceived the 'virtual benefits' of restoration to be important to capture. This could include engaging people outside the community in the restoration through the Osprey Cam for example</li> </ul>

### 4.3 Workshop key themes

- The workshop demonstrated the great interest in the local forest restoration and cautious interest about the prospect of business generation. However participants did not readily specify particular business ideas they wished to pursue.
- Timber was seen as a key resource for products and woodfuel.

- The participants of the workshop were eager to improve the recreational infrastructure, install interpretation material within the forest and create educational facilities including field stations and perhaps a bunkhouse for visiting students and scholars.
- Recreation is an important aspiration of the local residents who recognise that Arkaig could attract many visitors through amenity and recreation values. However keeping Arkaig remote and wild was a theme that emerged repeatedly, which does not easily align with the aim to create businesses and bring in more visitors to support the forest. There is a question of how to achieve economic stability and prosperity going forward but without becoming an overly popular tourist destination.
- Opportunities for virtual businesses and engagement tools were discussed, mainly inspired by the success of the osprey cam, so a similar concept that would broadcast aspects of the restoration process might be of interest to a similar and wider audience. Participants were less confident discussing the virtual opportunities, as they felt it was outside their understanding and skillset.
- The identity associated with Loch Arkaig Pine Forest was contested throughout the workshop, as participants grappled with the future direction and status quo reflecting on the relative importance of biodiversity, community, business, conservation or recreation. Reconciling these aims will be an important step for the community and the partnership.

## 5 Methods for socio-economic assessment

The socio-economic measures shown in Table 2 were modified following the workshop to ensure they fully reflected important factors in the area. For example, the importance of engaging youth in the forest was emphasised so measures to understand the benefits of a range of future opportunities targeting young people were included in the community survey. It was decided not to include the measures on perceptions of forest pests and non-native species in the surveys during this study. It was thought that questions on this might be answerable by only a subset of respondents with a high level of ecological knowledge. However, there may be value in exploring perceptions of these issues in the future as ecological restoration gets underway. Additionally, there may be value in training the local residents about the potential threats to the forest and issues over biosecurity. The residents and visitors could provide early-warnings for any pests and pathogens in the area, and could also provide the basis for long-term monitoring group for the restoration project through establishment and later stages of the forest's lifecycle.

### 5.1 Community Survey

A survey for the community residing in the vicinity of Loch Arkaig was designed and implemented using JISC online surveys (available online at [www.jisc.ac.uk/online-surveys](http://www.jisc.ac.uk/online-surveys)) (Appendix 1). The link to the survey was made available via emails sent out by the Woodland Trust to the two main community groups in the area: Arkaig Community Forest (ACF) and the Achnacarry, Burnakaig and Clunes (ABC) community group. In addition, paper copies of the survey were prepared and distributed by Woodland Trust staff and members of ACF. The survey used a mix of closed and open-ended questions to allow a balance between analytical ease and information richness. The survey was designed to capture the information tagged 'community survey' in Table 2.

## 5.2 Business Survey

A business survey was also implemented using JISC online surveys. The survey link was disseminated via a chamber of commerce newsletter and paper copies were distributed to selected local businesses by Woodland Trust staff. The business survey (Appendix 2) was designed to gather data using a brief series of open-ended questions to understand the perceived importance of Loch Arkaig Pine Forest in local business activities. Local businesses that were targeted included local estates, outdoor recreation providers, and accommodation/food providers. Also included was the Arkaig Forestry Co-op, which was established in May 2017 to supply and market forestry, ecology and estate management services to clients in Lochaber and the West Highlands. Advice and support from the Highlands and Islands Social Enterprise Zone (HISEZ) and the Just Enterprise programme on social enterprise development and trading subsidiaries, led to the establishment of Arkaig Forestry Cooperative Ltd as a standalone consortium cooperative in May 2017. One of the four main objectives of the co-operative, as set out in the 'Members' Agreement' is "To support and develop the restoration, management and silviculture of native woodlands and the objectives of Arkaig Community Forest SCIO in particular"

## 5.3 Woodland Trust Assessment

Many of the socio-economic measures require data that are (or can be) collected by the Woodland Trust. A spreadsheet (Appendix 3) was developed for Woodland Trust staff to enter relevant data for each theme. It is expected that the spreadsheet will be completed annually so that long-term trends can be monitored. The indicators used in the spreadsheet are shown in Table 6.

**TABLE 6 - DATA COLLECTED BY WOODLAND TRUST**

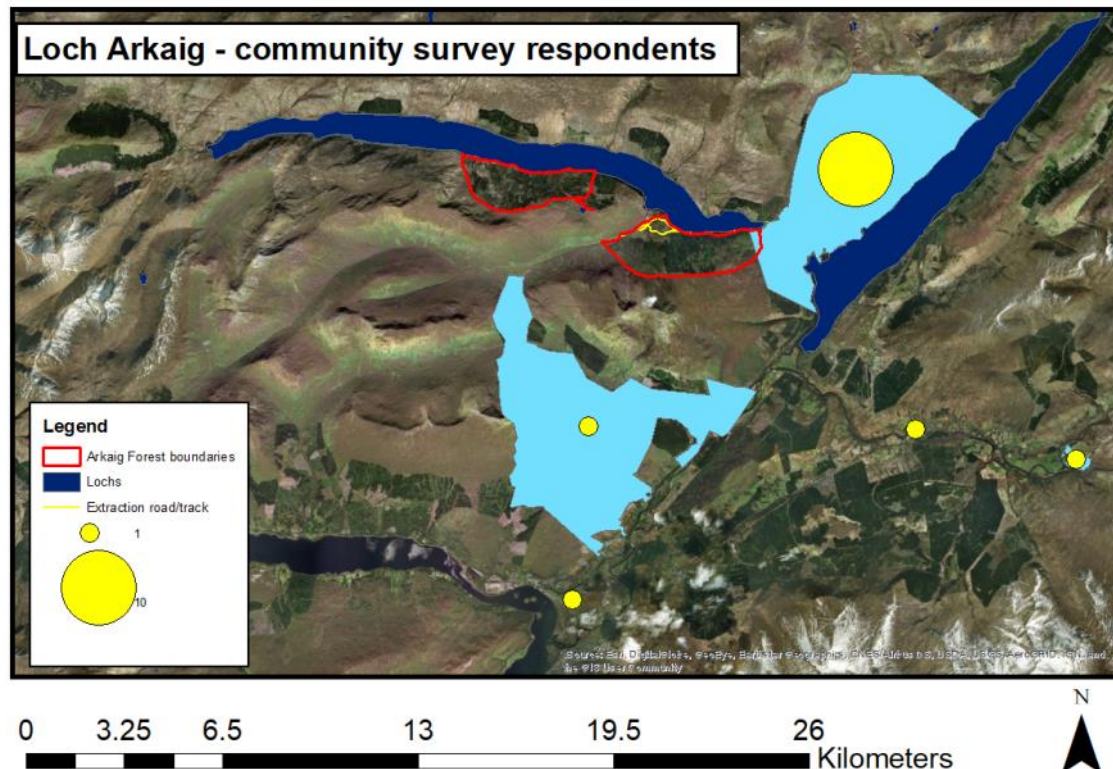
Theme	Data collected from WT (annually)
<b>Economic contribution</b>	Proportion and value of WT staff time Income from timber products Income from non-timber forest products Income from other site activities Income from grants Expenditure on site activities Value of spend with contractors and suppliers Estimated value of spend in other businesses by employees/contractors
<b>Community and partnerships</b>	Number of community groups involved Number of community members involved Number of other organisations involved Number of formal partnerships Number of formal interactions (e.g. other restoration projects)
<b>Volunteering and skills</b>	Number of volunteers (and volunteer days) Number of educational visits Number of local community members undertaking skills training Number of WT apprenticeships available or undertaken
<b>Wellbeing and cultural value</b>	Number of visitors Spend related to sites of cultural importance
<b>Other ecosystem services</b>	Number of woodlots Number of unique online visitors to osprey webcam

## 6 Results of socio-economic assessment

### 6.1 Community Survey

#### 6.1.1 Respondents

Sixteen survey responses were completed (15 online and 1 hard copy). The gender split was 56% female and 44% male. Respondents were all over 41 with 20% aged 66 and over. Forty-four percent of respondents were retired with the remainder either employed full-time, part-time or self-employed. Six respondents were members of ACF. Figure 4 shows the distribution of respondents' postcodes.

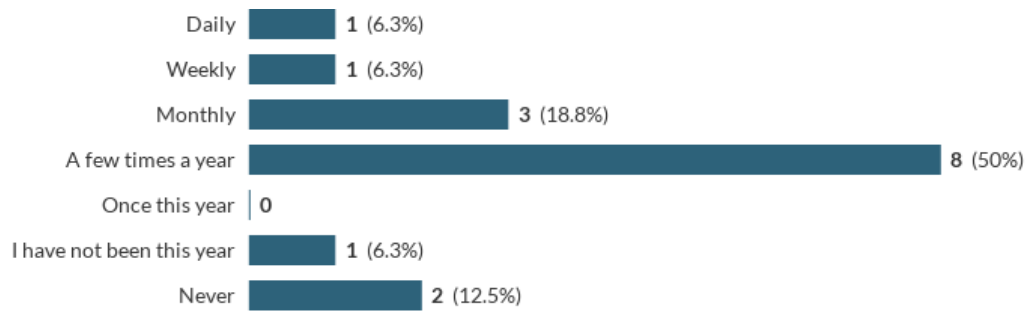


**FIGURE 4** - DISTRIBUTION OF COMMUNITY SURVEY RESPONDENTS BY POSTCODE

#### 6.1.2 Use of Loch Arkaig Pine Forest

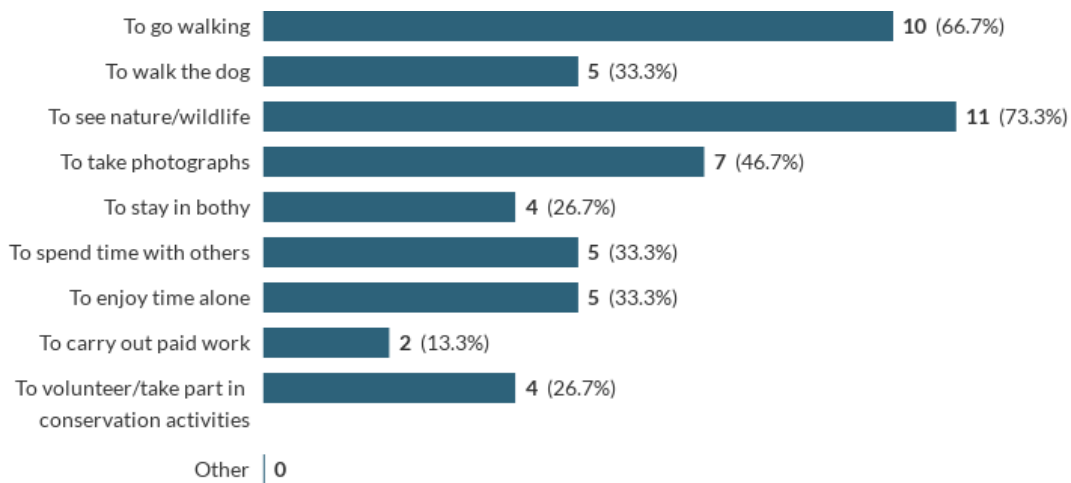
Half of the respondents reported visiting the forest a few times a year with 5 visiting more frequently and 3 visiting less frequently. Two respondents had never visited the forest (Figure 5). Respondents typically spent 1-5 hours there during visits over the last year. One respondent appreciated viewing the Forest from the North shore of Loch Arkaig using binoculars. Another respondent reported being unable to access the Forest. One respondent reported regular visits to the forest for work purposes but explained that they also use the area recreationally.





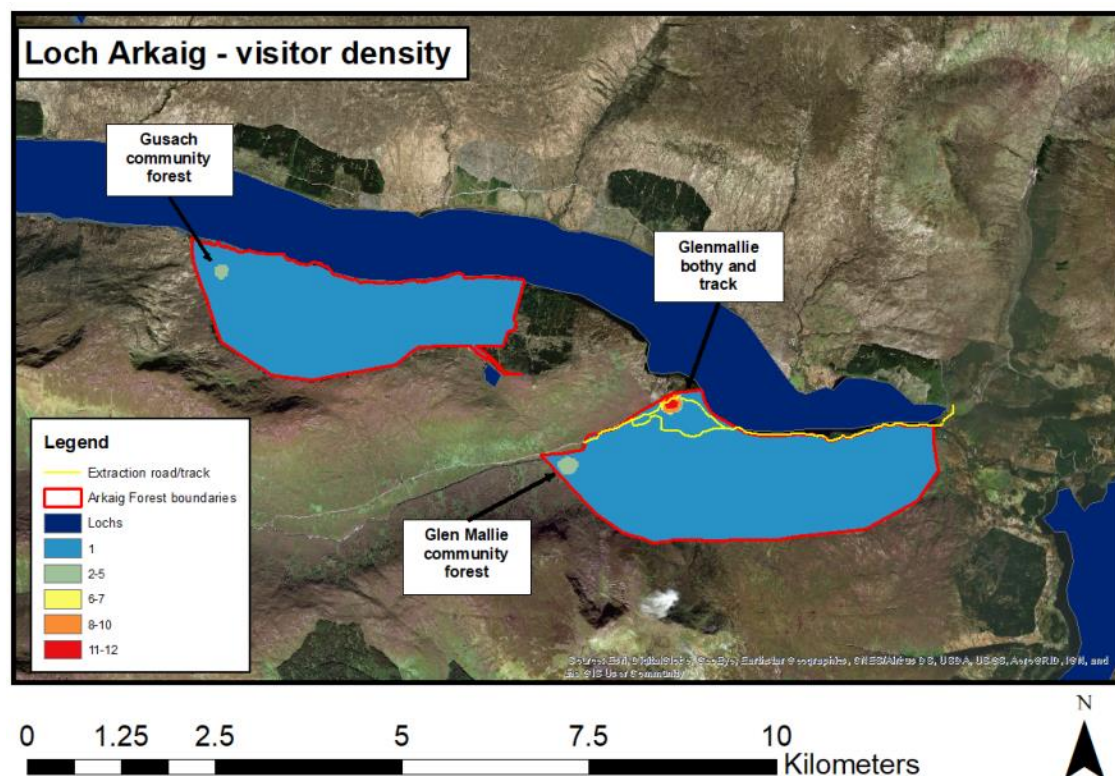
**FIGURE 5 - FREQUENCY OF VISITS TO LOCH ARKAIG PINE FOREST**

Respondents visited the forest for a range of purposes (Figure 6). To see nature and wildlife was the most frequently selected reason but to go walking was also a popular motive.



**FIGURE 6 - REASONS FOR VISITING LOCH ARKAIG**

Figure 7 shows a map of the frequency with which different parts of the forest were visited during the 12 months prior to the survey). The Forest track from Achnacarry to Invermaillie Bothy was the most frequently visited area but the Glen Mallie Forest and the Arkaig Community Forest Area within had been visited by approximately half of the respondents in the 12 months prior to the survey. The less accessible Gusach Forest had been visited less often. Overall it is apparent that respondents don't use the forest frequently.

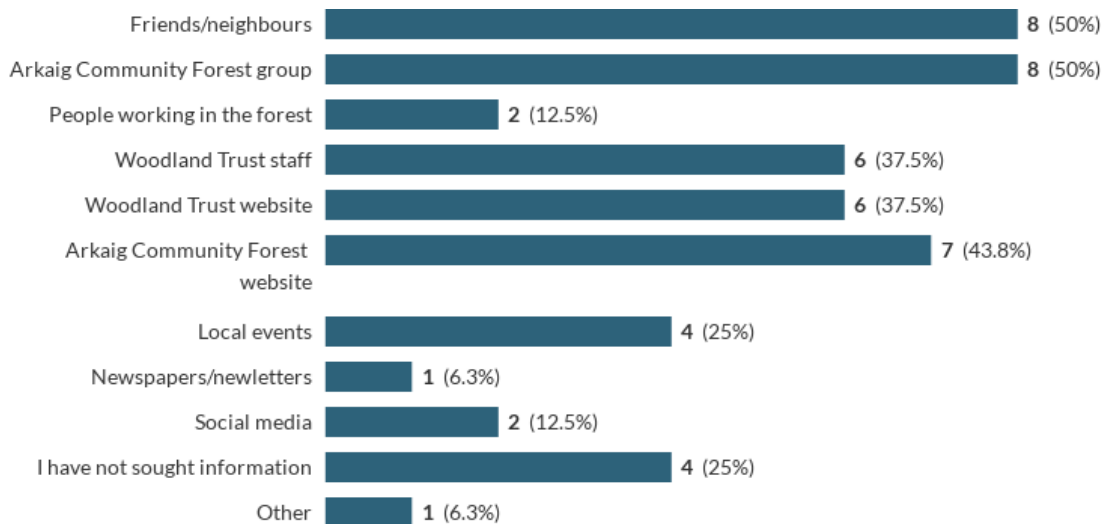


**FIGURE 7** - FREQUENCY OF VISITS BY RESPONDENTS TO PARTS OF LOCH ARKAIG PINE FOREST IN THE 12 MONTHS PRIOR TO THE COMMUNITY SURVEY

### 6.1.3 Awareness and interest in Loch Arkaig Pine Forest

All sixteen respondents were aware of the planned restoration at Loch Arkaig Pine Forest. Fifteen respondents were very interested or quite interested in the restoration with one respondent being unsure of their level of interest. One respondent reported living with a view of the forest and was interested in watching the progression and impact of the restoration. Another was interested in the conservation benefits of the restoration but reported concerns over a potential increase in visitor impacts. Another, who lived in close proximity to the pine forest, described aspirations for a career closely associated with the forests of Loch Arkaig.

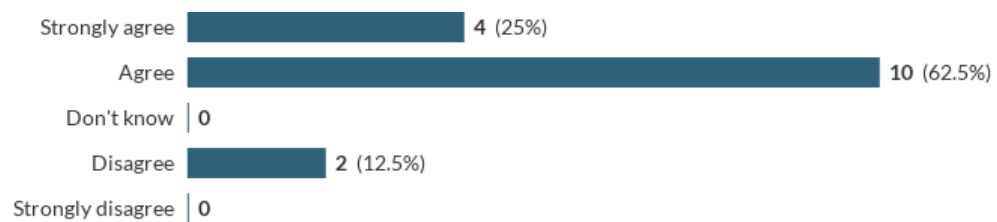
Respondents reported receiving information about Loch Arkaig Pine Forest from a range of sources (Figure 8). Contact with Arkaig Community Forest group and talking to contacts in the area was important for information exchange as was interaction with the Woodland Trust staff and website. Four respondents had not sought out any information about the forest.



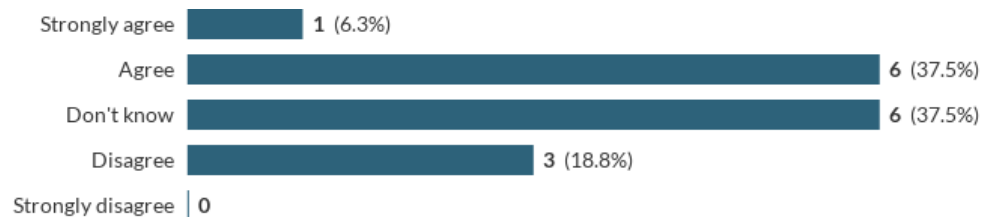
**FIGURE 8** - REPORTED SOURCES FOR INFORMATION ABOUT LOCH ARKAIG PINE FOREST

#### 6.1.4 Economic impacts of Loch Arkaig Pine Forest

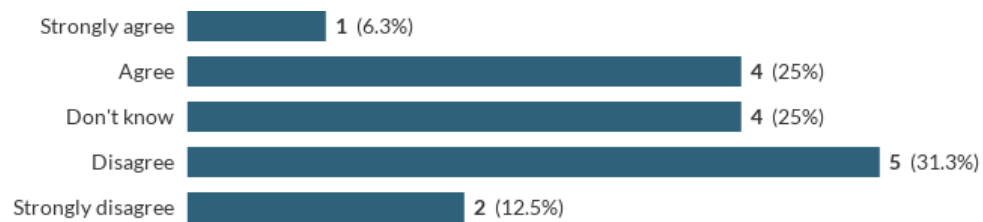
The majority of respondents (14 out of 16) either agreed or strongly agreed that Loch Arkaig Pine Forest provides employment opportunities locally (Figure 9). Views were more mixed as to whether the forest provides benefits for local businesses with 38% respondents saying they didn't know (Figure 10). Views were also mixed over the extent of impact of Loch Arkaig Pine Forest on the local economy in general and whether there was a lack of local employment opportunities (Figure 11 and 12). Three of the sixteen respondents reported that they had been engaged in paid work at Loch Arkaig since January 2016. This work included expedition leadership, herbivore impact assessment and forestry contracting services.



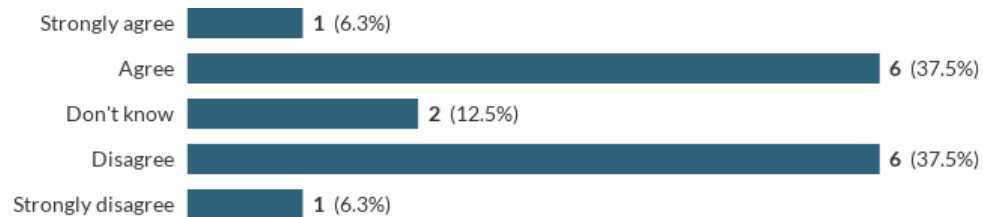
**FIGURE 9** - RESPONSES TO THE STATEMENT 'LOCH ARKAIG PINE FOREST PROVIDES EMPLOYMENT OPPORTUNITIES LOCALLY'



**FIGURE 10** - RESPONSES TO THE STATEMENT 'LOCH ARKAIG PINE FOREST PROVIDES ECONOMIC BENEFITS FOR LOCAL BUSINESSES'



**FIGURE 11** - RESPONSE TO THE STATEMENT 'LOCH ARKAIG PINE FOREST HAS LITTLE IMPACT ON THE LOCAL ECONOMY'



**FIGURE 12** - RESPONSE TO THE STATEMENT 'THERE IS A LACK OF LOCAL EMPLOYMENT OPPORTUNITIES'

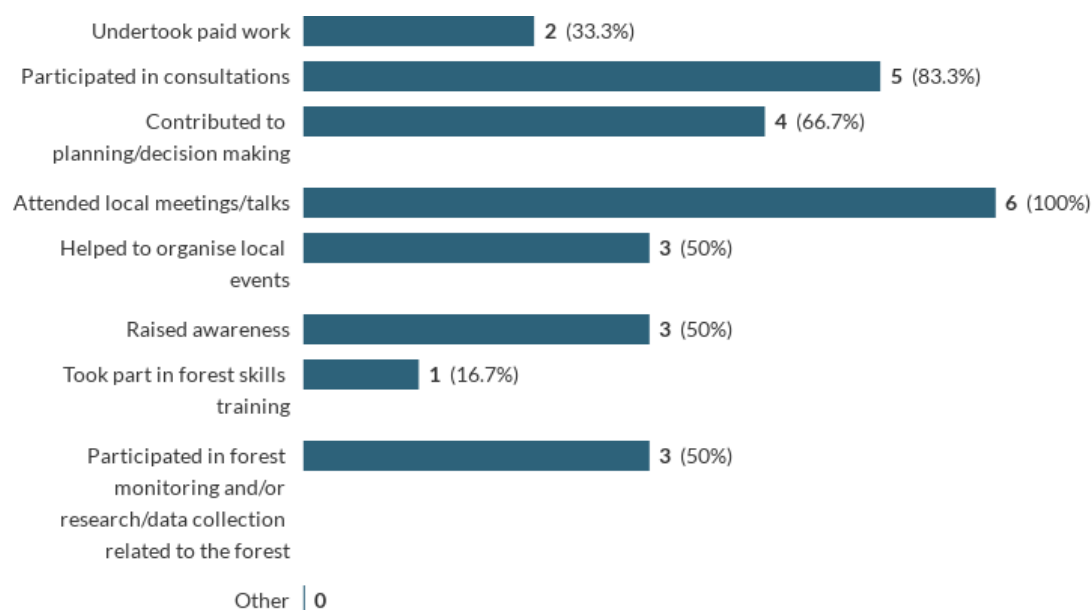
#### 6.1.5 Personal impacts of activities at Loch Arkaig

Questions were asked about the perceived personal impact on respondents of a range of activities either currently taking place at Loch Arkaig Pine Forest or that may take place in the future. Respondents had the option of stating that the activity had 1) no impact 2) positive or negative impact at the current time or 3) expected positive or negative impact in the future. The activities explored in the survey were derived from discussions with the Woodland Trust about the activities associated with the restoration plans and from the themes emerging in the community workshop.

Almost half of respondents believed that **tourism and recreation** did not impact on them at the time of the survey. Nobody reported experiencing negative impacts at the current time. Three respondents expected negative impacts in the future while four expected to experience positive impacts in addition to the two who reported already experiencing positive impacts. Half of the respondents (8) expected there to be negative impacts of **timber production** (including the movement of timber lorries) in the future while four reported positive benefits either at the current time or expected them in the future. Two respondents felt there was already a negative impact. A small number of respondents (4) expected the future **availability of wood fuel and woodlots** at Loch Arkaig to be positive while eleven reported this to have no impact on them. One respondent expected future impacts to be negative. Views were mixed as to the impacts of **non-timber production** from Loch Arkaig Pine Forest but were generally more positive. Seven respondents reported positive impacts either at the present time or in the future, five reported no impact and three expected negative impacts in the future. Ten respondents felt that activities to **develop forest skills and knowledge** at Loch Arkaig Pine Forest had no impact but three did report current positive impact and two more expected this to be positive in the future. Again one respondent expected a negative future impact.

### 6.1.6 Volunteering and participation at Loch Arkaig

Forty-four percent of respondents reported having carried out voluntary work related to Loch Arkaig Pine Forest, while 38% had reportedly taken part in other events projects or initiatives associated with the forest. Volunteering activities included practical activities related to Osprey conservation, removal of non-native trees, habitat surveys and also participation in relevant ACF, ABC and Woodland Trust meetings. A small number of respondents volunteer regularly e.g. three reportedly do so monthly but other activities are seasonal or more sporadic. Motivations to volunteer include a desire to help the community and an interest in wildlife and the outdoors. One respondent said that volunteering was a way of learning about the forest and its habitats. Barriers to volunteering include lack of time and a lack of awareness of what volunteering opportunities exist. Seven respondents said they would be interested in future volunteering opportunities while two were not sure. Of those who would like to volunteer in the future, two were particularly interested in practical work including wood lots and planting, while others did not have a preference and suggested they would be willing to apply their skills to relevant requirements. Respondents were asked if they participated in any other way in the management of Loch Arkaig Pine Forest. For the six who responded yes, Figure 13 shows the activities in which they participated.



**FIGURE 13** - ADDITIONAL ACTIVITIES CARRIED OUT BY RESPONDENTS AT LOCH ARKAIG

Two respondents reported that Loch Arkaig Pine Forest had allowed them to develop new skills while the remainder either said they had not developed new skills (11) or were not sure if they had (3). Respondents answered a series of questions indicating the extent to which themselves or members of their family would benefit from future activities targeted at young people at Loch Arkaig Pine Forest (Figure 14).



Response	1	2	3	4	5
	Not beneficial at all			Very beneficial	
School visits to forest	6	2	1	2	4
Awareness raising of Loch Arkaig Pine Forest in schools	6	3	0	4	3
Development of educational resources for children/schools	6	2	1	3	3
Duke of Edinburgh Activities at Loch Arkaig Pine Forest	6	1	2	3	3
Work experience opportunities	7	1	2	3	1
Training courses for young adults	7	1	2	3	1
Apprenticeships	7	1	3	2	1
Field courses/Research project opportunities for College/University Students	8	1	0	5	0
Outdoor skills/bushcraft courses	7	1	2	1	4

**FIGURE 14** - COUNTS OF SCORES GIVEN TO THE BENEFITS OF FUTURE YOUTH ACTIVITIES FOR RESPONDENTS AND THEIR FAMILIES. DARKER SHADES INDICATE HIGHER SCORE COUNTS

A subset of respondents reported that in general these activities would be of benefit to them. However, a greater number felt that these would be of no or very little benefit. It is highly likely that this reflects the demographic of the respondents who are mainly older and may not have young family members who would directly benefit. The highest perception of benefit was associated with awareness raising for schools and school educational resources. There was less perceived benefit from activities aimed at young adults.

#### 6.1.7 Importance of Loch Arkaig Pine Forest characteristics and attributes

Respondents were in strong agreement about the high importance of the species and habitat of Loch Arkaig Pine Forest (Figure 15). On a 5 points Likert-scale from 1 Not at all important to 5 Very important, thirteen respondents gave the highest score (5) to all four nature and wildlife attributes with the remaining three respondents scoring these as 4. These attitudes extended to other physical attributes of the area such as aesthetic landscape quality, quiet tranquil environment and there was also a majority of support for the importance of wildness and remoteness (Figure 15). Views were more mixed about the importance of Loch Arkaig as a place for recreation and the importance of well-maintained paths and tracks. Similarly, the historical value of the forest was not perceived to be as important as its natural heritage attributes. The importance of available information about Loch Arkaig (both online and through interpretation boards and publications) received a mixed response. Ten of

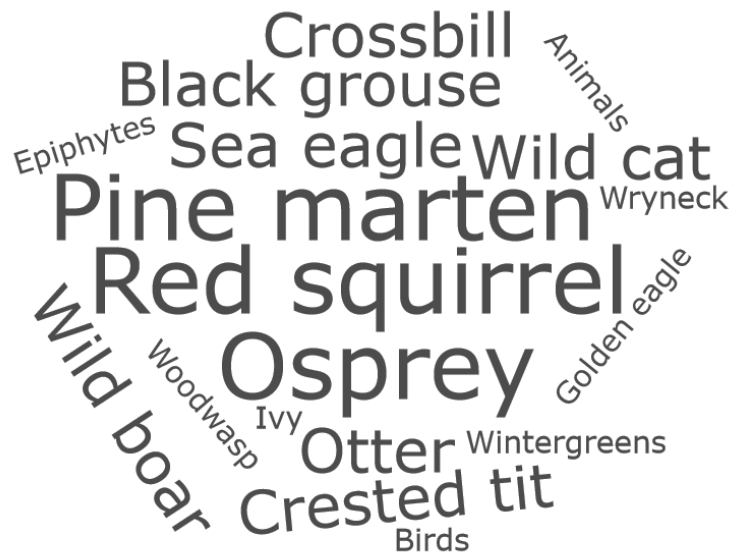
the respondents gave a score of 4 or 5 (the top 2 scores) while the remainder scored 3 or 1 (not important at all). Views were very mixed regarding the importance of community involvement and education at Loch Arkaig. In particular, most respondents did not consider the development of local business opportunities to be a priority. Neither was there a great appetite evident for developing woodlots. The respondents were quite evenly split as to whether they viewed opportunities for community engagement and ownership of the forest as important. However, a majority of the respondents (9) felt that it was very important that Loch Arkaig is a place for young people to learn about forests and nature.

Score	1	2	3	4	5
	Not at all important			Very Important	
<b>Nature and Wildlife</b>					
Presence of specific native fauna e.g. ospreys, sea eagles, otters	0	0	0	3	13
Presence of native trees and other native vegetation	0	0	0	3	13
Diversity of habitats, plants and animals	0	0	0	3	13
Condition and health of forest	0	0	0	3	13
<b>Recreation and culture</b>					
Aesthetic landscape quality	0	0	0	5	11
Quiet and tranquil environment	0	0	1	6	9
Place for recreation e.g. walking, camping	2	1	3	5	5
Well maintained paths and tracks	1	2	6	4	3
Wildness	0	0	3	5	8
Remoteness	0	0	3	7	6
History of the forest	0	1	4	8	3
Information available online about Loch Arkaig Pine Forest e.g. website, web-cams	2	0	4	4	6
Information available at Loch Arkaig Pine Forest e.g. interpretation board, publications	2	0	4	6	4
<b>Community involvement and education</b>					
Opportunity for involvement in forest management through community engagement and community ownership	2	3	3	2	6
Opportunities to develop new business ideas that will provide local income	2	4	5	1	4
Opportunity for woodlots in forest	6	1	3	3	3
A place for young people to learn about forests and nature	2	1	2	2	9

**FIGURE 15** - COUNTS OF SCORES GIVEN TO THE IMPORTANCE OF CHARACTERISTICS AND ATTRIBUTES OF LOCH ARKAIG PINE FOREST. DARKER SHADES INDICATE HIGHER SCORE COUNTS

#### 6.1.8 Species and habitats of Loch Arkaig Pine Forest

Seven of the sixteen respondents visited Loch Arkaig Pine Forest with the hope of seeing specific species of animals and plants. Respondents were asked to state these species. The relative frequency with which certain species were mentioned is shown as a word cloud in Figure 16.



**FIGURE 16** - WORD CLOUD OF THE SPECIES RESPONDENTS HOPED TO SEE ON VISITS TO LOCH ARKAIG PINE FOREST

Seven out of sixteen respondents had concerns about changes to plants and animals at Loch Arkaig Pine Forest in the future. Six said they had no concerns and three were unsure. Two respondents were concerned that the timber extraction phase of the restoration process will disturb existing wildlife and destroy some of their habitat in the short term. Another was worried about the general disturbance to the area caused by increased numbers of visitors and a loss of remoteness and wildness which are considered the area's greatest strength. Another respondent was concerned about the potential impacts of future species re-introductions and a comment from another stated that species diversity should improve as the pinewood is restored.

Fourteen of the sixteen respondents reported having viewed the Loch Arkaig Osprey Cam online. Thirteen had visited the Woodland Trust Loch Arkaig Pine Forest website and the Arkaig Community Forest website.

#### 6.1.9 Further Research

Ten of the sixteen respondents stated that they would be willing to participate in further research related to the Loch Arkaig Pine Forest restoration project.

#### 6.1.10 Summary of key findings

- Awareness of restoration project is high among respondents

- Woodlots are not seen as particularly important
- There is tension over increased numbers of visitors in the future and potentially negative impacts on the area.
- There are concerns over impacts of timber extraction
- The natural heritage value of the area is very important to all respondent: species, habitats, aesthetics and tranquillity. Aspects associated with recreation and culture are perceived as less important.
- Views on the importance of community engagement and new business ideas are more mixed – this is reflected in the mixed interest in volunteer opportunities
- Youth opportunities will generally provide little benefit to respondents and their families but some felt that activities involving schools would be of benefit.

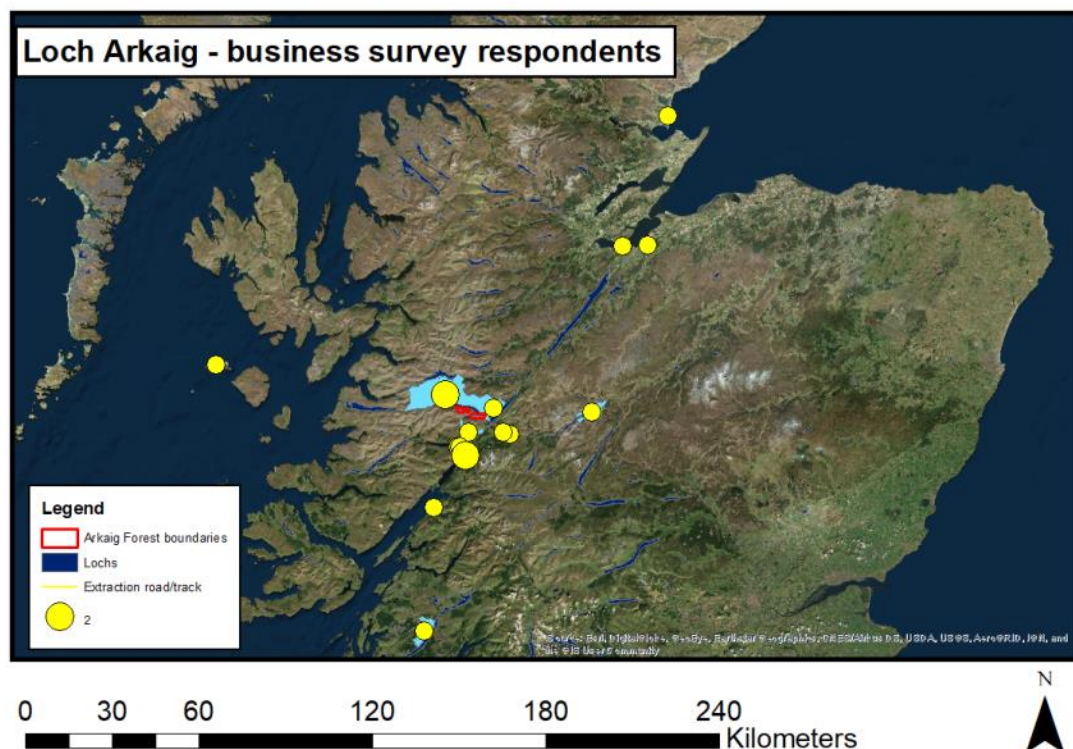
## 6.2 Business Survey

### 6.2.1 Respondents

There were nineteen responses to the survey of businesses. The summary of the types of businesses that responded is shown in Table 7 and their geographical locations in Figure 17 (note that one business is included under two business types).

**TABLE 7 - BUSINESS RESPONDENTS BY TYPE**

Business Type	Number
Community Group support	1
Activity providers	4
Accommodation providers	2
Forest management services/maintenance	6
Ecological consultancy	5
Timber processing	1
Photography	1



**FIGURE 17 - BUSINESS LOCATIONS BY POSTCODE**

All but one of the respondents were aware of the forest restoration plans. All expressed willingness to be further involved in research related to the restoration, which was not the case for the community survey.

### 6.2.2 Accommodation providers

The accommodation providers included a Bed & Breakfast and holiday cottage letting businesses and reported receiving customers from around the world. The B&B had been in existence for 40 years and the holiday cottage letting for 10 years. One provider was not aware of the restoration plans and did not believe Loch Arkaig Pine Forest impacted on their business through, for example guests staying with the purpose of visiting the forest. The other explained that the forest restoration may strengthen the area as a tourist destination, with positive impacts for holiday cottages. There was a further suggestion that the high profile arising from the Osprey web cam was already having this effect. However the respondent went on to highlight potentially negative impacts of the planned timber extraction, specifically increased numbers of timber lorries on small roads that are already in bad condition. The respondent felt that this would directly impact their business and expressed some concerns over a lack of consultation and communication.

### 6.2.3 Activity providers

The four activity providers who responded to the survey reported having existed for between 9 and 14 years and tend to operate across Lochaber attracting customers from across the UK and internationally. Activities provided include wildlife tours, water sports, 4x4 driving, stalking, shooting

and fishing. Three out of the four had supplied services to Loch Arkaig Pine Forest in the form of training, guiding and transportation of volunteers, Woodland Trust staff and others involved in site management. However, estimates of income directly related to Loch Arkaig Pine Forest were very low ranging from 'negligible' to 1%. Two of the providers reported using the forest for business activities which included a sporting lease for deer stalking and running overnight tours with camping in the Gusach forest block. The latter respondent actively encourages tourists to visit Loch Arkaig by running trips to the area and has increased the numbers of trips since becoming more aware of the forest. The sporting provider reported some tension between the management of Loch Arkaig Pine Forest and deer management activities and concerns that these issues would continue as the forest restoration progresses. Two of the providers expected the restoration to bring additional opportunities for tours, including increased wildlife watching opportunities and another said there would be little impact on business but hoped for better access and options for camping locations in the long-term. Three providers felt that impacts on other local businesses would be largely positive, although it was noted that there could also be felling noise and disruption and increased traffic.

#### 6.2.4 Forest management services/maintenance

There is a more direct link between these businesses and use of Loch Arkaig Pine Forest. Six respondents provided forest management services which included construction work, harvesting, timber extraction, maintenance of fences and tracks, timber marketing and native forest management. One business to provide woodland craft products is currently at the development stage. Others had existed for between 2 and 70 years. Two of the businesses were local to Loch Arkaig while the remainder operated across the Highlands or wider Scotland/England. The proportion of income directly linked to Loch Arkaig Pine Forest was reported to be less than 5% for the North Highland District of one business, 10% for one year for construction and maintenance work conducted by two businesses and up to 90% for the Arkaig Forestry Co-op who provide forestry services. One business referred to their work at Loch Arkaig on social media. Two of the businesses reported impacts of Loch Arkaig Pine Forest on their start-up and development. The individual developing the wood crafts company said involvement with the forest had led to his aspirations to produce craft goods based on what the forest can provide during the different stages of the restoration.

The Arkaig Forestry Co-op was created as a vehicle to bring local individuals together to provide contractual services to Woodland Trust at Loch Arkaig Pine Forest. The restoration is the main business of the cooperative. The respondent commented that the completion of the restoration would be an opportunity for the cooperative to evolve into industries that make use of the forest such as ecotourism or wood fuel. The respondent developing a business based on forest products said he hoped to use the story of the restoration in his branding. The other businesses expected to provide services during the restoration e.g. the design and build of timber extraction routes and forest harvesting and establishment. One business envisaged being involved in the design and construction of extraction routes but did not anticipate further requirement for their services following the harvesting and extraction operations. Respondents generally agreed there would be positive impact on other businesses. The benefits for local tourism were mentioned by one respondent and another explained that they would expect an economic benefit from the more active management of the resource for local wood processors and the supply chain (e.g. machine operators, hauliers, mill workers).



### 6.2.5 Ecological Consultancy

Five respondents provided ecological consultancy services. This covered woodland management, dendrochronology, herbivore impact assessment, mycology and lichen surveys. Respondents tended to work alone as independent consultants. Apart from the Arkaig Forestry Co-op, respondents operated across the wider Highlands and Scotland. These consultants estimated the proportion of their income to come from Loch Arkaig Pine Forest to be 1% to 20%. Two consultants said their work had been one-off surveys so in these cases % estimates were for only one year. The Arkaig Forestry Co-op reported receiving 80% of income from the Loch Arkaig Pine Forest project which includes ecological survey work as part of a wider suite of forestry management services. All five respondents offering ecological consultancy expected the restoration to have positive impacts on their businesses in terms of the need for future survey and monitoring work and one mentioned the potential for offering other activities in the future e.g. fungi forays for visitors. It was also felt that the restoration would be positive for business in general and could provide future employment opportunities, providing local community benefit. One respondent suggested that the forest could provide new opportunities in specialist ecological and forestry related areas.

### 6.2.6 Timber processing

A respondent representing a timber processing business stated that they hoped to expand their activities in the area and that an existing area of Spruce within Loch Arkaig Pine Forest could be well-utilised. The respondent reported that the business supports a large number of jobs in the local rural economy and raised concerns over a lack of productive woodland in the area. The challenges of timber harvesting and transport were recognised but it was suggested that maintaining a small area of productive conifer in the long term would help provide Woodland Trust with income. The respondent commented that there was a need to seek the right balance between well-managed productive forestry and native pine and broadleaved forests.

### 6.2.7 Photography

A photography business with an established relationship with the Woodland Trust had completed work associated with advertising and publicity and expected further work opportunities in the future due to the restoration project.

### 6.2.8 Summary of key findings

- Business respondents had a high awareness of the restoration plans.
- There were some concerns about the impacts of timber extraction on accommodation providers.
- Business respondents generally thought that restoration would have positive influence on their own and other business.
- Opportunities for new business activity in future include wood products, tourism, ecological services, and public engagement events.
- There was an awareness among businesses of the potential tension between community interests and business development.

General comments from business survey respondents:

*"I am concerned about the apparent disproportionate influence the local community group would appear to have on proposed deer control & timber extraction"*

*"A good long term project providing some local employment and community involvement especially after the major tree harvesting/clearing is completed"*

*"The interests of the local community should be considered very important in how local business opportunities are developed"*

*"Forest restoration will have a beneficial effect on the locality. It has the potential to bring many more people to the area. WT and ACF which owns <100 acres will have to ensure that provision is made to manage visitors and others who use the wood (Access, parking, litter maintenance etc.)"*

### 6.3 Woodland Trust assessment

This section summarises the data collected by Woodland Trust staff for each theme.

#### Economic contribution

As the Loch Arkaig Pine Forest is still in the establishment phase fundraising is ongoing. To date, £4 million has been raised for the Loch Arkaig Pine Forest restoration project with an estimated £1.1 million yet to raise. Project costs are likely to fluctuate depending on timber prices, infrastructure needs, local markets, extraction methods and a range of other variables. Income has and continues to come from a range of sources including: players of the People's Postcode Lottery (PPL), major donors, private trusts, corporate partners, as well as members and supporters. It is important to highlight that four full-time equivalent jobs have been created in association with Loch Arkaig Pine Forest since the acquisition; two Woodland Trust positions and four part-time two Arkaig Forest co-op positions.

The forest itself does not generate any income and will require further funding for the restructuring and restoration of the pine forest, including operations for timber harvesting and extraction. This may also provide some income for both the Trust and community through the sale of timber depending on the type of product and proximity of mills. Methods for extraction are still being explored by the Trust and community group with the potential for barge extraction over the loch to the forest road a possibility. The cost of such a method will require further investigation and scoping of expertise in barge extraction.



**FIGURE 18** - OLD GROWTH SCOTS PINE AFTER HALO THINNING (L) AND VIEW OF INVERMALLIE FOREST BLOCK SOUTHERN SHORE (R)

A trip to Finland for WT staff and ACF members to view and explore barge extraction techniques for current and future operations may be considered in 2019. Only 3% of timber in Finland is transported by barge or waterway due to the general affordability of truck transportation (Laitila et al. 2016), however Väättäinen (2018) highlighted that biomass chips extracted through an established waterway, close connections to resource and relative proximity of end-user can be a competitive alternative, especially in geographically isolated areas. Feasibility of barge extraction at Loch Arkaig is currently being explored in consultation with forestry operations experts (Tilhill) who have experience in waterway extraction (mostly coastal).

### Community and partnership

Currently Arkaig Community Forest (strategic decision-making) is the main partnership alongside the Arkaig Forestry Co-op (management and activity), which are both vital relationships for the Woodland Trust to realise and mobilise the community investment in and benefit from the forest and surrounding area. The partnership with Arkaig Community Forest was formalised through a memorandum of understanding and the establishment of the Loch Arkaig Pine Forest Advisory Board. Many members of Arkaig Community Forest are also members of the Achnacarry, Bunarkaig, and Clunes Community Group, who are also key community stakeholders in the Loch Arkaig Pine Forest project. A number of local sub-contractors have worked on surveying and monitoring activities.

The Lochaber Fisheries Trust and SNH Peatland Officers have also been involved in providing advice and funding for the restoration project during 2019.

Woodland Trust Scotland and Trees for Life have a formal partnership through the Caledonian Pinewood recovery project, which has surveyed the Loch Arkaig Pine Forest (Caledonian Pinewood Inventory site) and surrounding remnant Caledonian pinewoods.

Woodland Trust Scotland are members of the Native Pinewood Managers Group, who will be visiting Loch Arkaig Pine Forest in 2021. Woodland Trust staff and Arkaig Community Forest members also regularly attend the Native Woodland Discussion Group events.

A series of informal interactions with other landowners and organisations with experience of native woodland restoration are being considered by WT with the intention of site visits and knowledge exchange:

- Forestry Commission - Coille Phuiteachain
- Forestry Commission - Black Wood of Rannoch
- Forestry Commission - Glen Affric
- SNH - Beinn Eighe
- Trees for Life - Dundreggan
- National for Trust Scotland - Mar Lodge
- RSPB - Abernethy
- Private - Grant Family - Rothiemurchus
- Private - Anders Povlsen - Glen Feshie
- Private - Guthrie Family - Conaglen
- Private - Bruce Family - Glen Tanar
- Private - Cameron Family – Achnacarry

Additional partnerships may help Loch Arkaig Pine Forest to diversify interest, increase reach and potential benefits, and facilitate activities derived from the forest.

### Volunteering and skills development

Loch Arkaig Pine Forest hosted a single educational visit in 2018, a workshop on the re-survey of pinewoods that was originally spearheaded by Professor Robert Bunce in 1971. The event also brought together and trained interested parties in survey techniques that will subsequently be used in the resurvey of all 26 pinewoods. There is great scope for educational ties and professional partnerships that will most likely develop organically alongside the restoration. Engagement with primary and secondary schools, colleges and higher education institutions will need to be actively pursued through professional networks, social media, marketing and personal contacts to maximise this opportunity.

The old Forest School at Clunes presents an opportunity for a learning space about the restoration, local forests, history of the area and future plans.

A total of 20 volunteer days, using volunteers from within Lochaber region, have contributed to a range of work since 2017 including:

- Felling to waste for peat restoration (Glen Mallie)
- Osprey platform construction
- Fence removal (Gusach)
- Hide construction (Glen Mallie)



**FIGURE 19** – ONE OF THE ARKAIG FORESTRY CO-OP MEMBERS USING THEIR TRAINING TO HELP MANAGE THE FOREST

Skills development has focused on Loch Arkaig residents who have been employed or are helping-out with the early stages of the restoration and project establishment. Qualifications achieved include:

- 4 ATV certifications
- 2 powerboat certifications
- 4 chainsaw certifications (NPTC)

Loch Arkaig Pine Forest could present an opportunity to develop a forestry skills centre. Local forestry skills have been lost from localities over the past 50 years and upskilling of local users, residents and volunteers would improve both local forest management implementation and forestry knowledge.



### Well-being and cultural value

Known visitor numbers are low with only 28 visitors in 2018, 20 of which were either WT Trustees, donors or ACF members. Eight other tours were provided throughout the year to interested parties. The local area is a popular biking and hiking spot, intersected by the Caledonian canal. The Clan Cameron museum on the Achnacarry (Lochiel) estate is thought to have attracted Clan relations from around the world and offers holiday accommodation. The area also has several unofficial walking and cycling routes, which could be linked to the restoration site and a bothy at Invermaillie. No study or data has been captured on the health or personal benefits of Loch Arkaig forest, which could be an area for green prescriptions and rehabilitation, especially as the combination of the remote forest and loch offer a unique experience.



**FIGURE 20** - ATV FOR VISITOR TOURS (L) AND DOCK FOR BOAT 'ARKAIG FIRE' (R)

A feasibility report (unpublished) on '*South Loch Arkaig: Dendrochronology & Woodland Management History, Assessment of Potential*' (Mills & Quelch 2018) was commissioned (£3,000) in 2018 to help the ACF and WT understand the resource with a view to future management, conservation and restoration.

### Wider ecosystem services benefits

In terms of benefits from wider ecosystem services, at the time of this study there were no existing woodlots for providing a local supply of woodfuel for residents and sale in the local area. Such woodlots and endeavours were identified as a future activity at the workshops, however woodlots were not viewed as broadly desirable in the community survey. Woodfuel provides a potentially short-term management action and use for a sustainable product that would be carbon neutral, especially if distributed within the local area. In general a demand for logs and chips is relatively high in Scotland and the majority of woodfuel products are imported from abroad. These imports have dramatically increased over the past five years in line with demand – therefore a business centred upon woodfuel would likely be successful within Lochaber or neighbouring areas. Such an operation may be more of a long-term aim for Loch Arkaig Pine Forest partnership, the focus shall remain on managing the available forest resource.



**FIGURE 21** – AREA OF ARKAIG FOREST CLOSE TO BRIDGE FOR EXTRACTION EASE, WITH FOREST TRACK IDENTIFIED AS SUITABLE TRANSPORT ROUTE CONNECTED TO POTENTIAL WOODLOTS

The Loch Arkaig Ospreys are very popular and capture the public’s interest, who become invested in the lives of individuals, as can be seen from the thread of comments (32,000) on the webcam page. This is further demonstrated by the plight of Pean, a fledging osprey from a nest further up Loch Arkaig that was electrocuted by a powerline in Spain in December 2018. BBC News picked up the story in January 2019, which highlights the national interest in raptors and conservation issues.



**FIGURE 22** – OSPREY LOUIS CAPTURED BY WOODLAND TRUST WEBCAM WITH *PINUS SYLVESTRIS* PROVIDING STRUCTURAL ELEMENTS FOR HIS NEST



Online visitor numbers for Ospreys at Arkaig are over 200,000, with nearly 300,000 sessions of the osprey cam loaded between 2017 and 2018. This demonstrates a large interest in an already iconic species of the forest, this interest could be transferred to wider activities of the forest restoration and Arkaig area.

## 7 Discussion

### 7.1 The social and economic value of Loch Arkaig Pine Forest

The range of approaches used in this study allowed us to gather a comprehensive insight into both the current social and economic value of Loch Arkaig Pine Forest and views concerning the restoration plans for the forest and their potential impacts. While the number of community members who engaged with the workshop and survey was relatively low, it reflects the small size of the community. Considerable effort was made to raise awareness of the community workshop drop-in and evening sessions and the community survey was disseminated and extended over a period of four months to encourage as much uptake as possible. In addition, Woodland Trust staff and ACF members handed out and collected paper copies of both surveys to local community members. All community respondents and almost all businesses were aware of the forest restoration plans and information appeared to be available to the community from a range of sources, which suggests that communication about the forest and restoration project is generally good. A fundamental measure in the future will be the extent of interest and engagement of the community with the forest and the restoration. As the restoration progresses, awareness of Loch Arkaig Pine Forest may increase and widen geographically, possibly leading to increased participation in workshops and community focused events where attitudes to the forest can be monitored.

The most striking finding to emerge from the study is the great value held for the natural heritage of Loch Arkaig Pine Forest ([section 6.1.7](#)). The community survey clearly shows that the presence of native species, biodiversity and the condition of the forest are of foremost importance. Encountering nature and wildlife was the most frequently selected reason for community respondents to visit the forest. Also highly valued are the aesthetic landscape qualities and the perceived wildness and remoteness of the area. The value for these qualities was expressed in very positive terms but their importance was also reflected in comments related to the future impact of increased development and visitor access. A common theme across the community workshop and both the community and business survey was the concern that increased publicity about the forest and development in terms of access and infrastructure could lead to significant increases in visitors to the detriment of the undisturbed and secluded nature of the area. It was emphasised in both the workshop and surveys that there is good provision for visitor access, use and enjoyment of forested areas both elsewhere in the region and across Scotland, and that similar development should not be pursued at Loch Arkaig, which represents a rare example of a relatively undisturbed forest with wild character. There were mixed views concerning the importance of providing information at Loch Arkaig (e.g. through interpretation boards) and online through websites and webcams, which may also relate to this tension about attracting greater attention to the area.

Interestingly, despite the frequency of comments from both the workshop and open survey questions about concerns of increasing visitor pressure, a specific question asked in the community survey showed that respondents did not experience any negative impacts from tourism and recreation at the

time of the survey, with several in fact experiencing a positive impact currently or expecting this in the future ([Section 6.1.5](#)). No one reported any current negative impacts and only 3 out of 16 respondents thought that there would be a negative impact of tourism in the future. This apparent discrepancy might suggest that the community feel that the current plans for the restoration are not expected to lead to a great increase in visitor pressure, but at the same time wish to communicate the importance of preserving Loch Arkaig in the face of possible pressure in the future. Comments frequently emphasised the importance of the conservation work being done as part of the restoration of the native forest over the benefits related to improved access and infrastructure.

There were some contrasting results from the community workshop and survey responses regarding the interest in local business development. While enthusiasm for certain initiatives was expressed in the workshop, the responses from the community and business surveys were more cautious and concerns over increasing visitors and infrastructure development expressed. It may be that the structure of the workshop (where future possibilities for the forest were discussed under a range of themes) made participants feel more compelled to make proposals that are not necessarily widely supported. The interest in new business development may be more prominent from respondents not living in the close vicinity of Loch Arkaig.

The tension between economic opportunities at Loch Arkaig and the desire to preserve the area was apparent in the community workshop ([section 4.2.1](#)). However, there was support for utilising timber resources and enthusiasm for exploring the opportunities for non-timber forest products. There was also some discussion of the potential for community woodlots in the workshop. Conversely, the community survey suggested that there is little appetite for future woodlots and woodfuel, though this may be partly due to a lack of information about what such schemes would entail ([section 6.1.7](#)). There may be a need for communication regarding the responsibility and management requirements for woodlots and production of woodfuel, as talking through practical steps of processes can demystify the activity and remove the perceived barrier. One of the general comments submitted by a community respondent stated that there are plenty of woodland areas that could be used for woodlots elsewhere, for example via the Forestry Commission. This reflects a wider theme to emerge from the study that given the extensive nature of woodland and forestry based facilities and activities available in Scotland, that native woodland remnants of high conservation value such as Loch Arkaig Pine Forest should remain undeveloped. Interestingly there appeared to be a more positive response to the non-timber production (the examples given were food such as venison and foraging activities) than for woodlots/wood fuel. There was a similar tension between opportunities for improving access to the area and the preference for minimising human presence in the forest. Ideas for developing path networks for walkers and mountain bikers were raised in the workshop by a small number of participants. However, overall there was more emphasis on preserving the serenity of the area and a wariness of increased access and facilities.

The discussion on community engagement in the workshop was focused on the importance of attracting young people to Loch Arkaig and ways of engaging this group in forest activities ([section 4.2.2](#)). To understand wider perceptions of what the restoration may offer younger people, specific questions were included in the community survey on this theme. It was apparent that opportunities for young people, including engagement with schools and training/apprenticeship opportunities would not be of particular benefit to the community respondents and their families but there was a general recognition that it is important that the forest be a place where young people can learn about forests and nature. There are currently few children and younger people residing in the Loch Arkaig area so the possibilities for youth engagement will depend to some extent on future demographic patterns, as well as the scope for engaging a wider geographical community of your people.

There is considerable scope for future studies to both inform and learn from the Loch Arkaig restoration project. For example, as the ecological restoration gets underway, it will be timely to explore perceptions of issues such as forest pests and non-native species. There are opportunities for developing training and volunteering opportunities to optimise community engagement with ecological aspects of the restoration.

There will be value in repeating various questions used in the baseline survey. For example, it will be interesting to evaluate whether on the ground restoration leads to differences in perception of local economic benefit. Also, the baseline data provides a valuable opportunity to assess shifts in perceptions towards community engagement and ownership of forests.

## 7.2 Manager reflections on assessment results

A meeting was held between the project team and Woodland Trust staff to discuss the study results and to reflect on how the findings could be used to i) draw conclusions about the current social and economic value of Loch Arkaig Pine Forest ii) inform the design of ongoing socio-economic monitoring and iii) inform other aspects of the future management of Loch Arkaig Pine Forest.

**i)** A large part of the discussion focused on discussing the results from each part of the socio-economic baseline study. Woodland Trust staff generally felt that the responses and themes to emerge from the study reflected their own interpretation of community and business attitudes towards the forest and restoration plans. They are well aware of the tension between the opportunities that the restoration will provide in terms of infrastructure and access development and the desire to retain the wild character of the area. Some implications for management were discussed. The aims of the planned improvements to the path network are to facilitate forestry management and deer management, but these will also provide benefits for the community who use the forest and those who would use it more under improved access. The paths will also benefit visitors to the area who wish to explore Loch Arkaig Pine Forest. However there are no plans to provide signposting or directions besides some basic information at the Clunes Forest School to let people know the paths are there. This will allow people to explore the forest under their own steam without leading to the pressure that could result from trails directly targeting tourists. Discussion reflected the overall views from the workshop and surveys, that the improved access that will result from the forest restoration will primarily be of benefit for the local community and that there should be not be additional aims of facilitating access for large numbers of visitors.

**ii)** The study team and Woodland Trust staff agreed that the measures used in the surveys together with workshop results provided a comprehensive baseline socio-economic dataset that could be used to measure social and economic change in the future.

There was some discussion over the apparent lack of interest in wood fuel and woodlots to emerge from the community survey. It is possible that considering wood fuel and woodlots as part of the same question may have led to responses that were more negative than expected. Woodland Trust staff consider there to be a lack of clarity about the concept of woodlots and concerns among the community over how such a scheme would work. There may have been more interest in a simple wood fuel scheme in the area. We would therefore suggest that attitudes towards specific initiatives are collected in future. It is possible that a successful project to supply wood fuel to the local community may lead to other opportunities further in the future where the community could get more involved in managing areas for timber themselves. It will be interesting to monitor how the

interest in different types of schemes evolves over time but this should be done in a way that manages local expectations concerning the possibilities available.

The theme of community capacity and community empowerment was discussed. This was captured in the community survey to some extent through questions about skills, opportunities and the involvement of respondents in local meetings and events. It may be beneficial to explore changes in greater depth as the restoration progresses. This could be linked to an ongoing analysis of local partnerships and projects. Edwards et al. (2009) include community capacity as a key socio-economic theme which encompasses indicators on involvement in community woodland groups, income of community woodland groups, extent of consultation and the public perception of the community capacity benefits of forests. The latter indicator explores the role of forests and woodlands in facilitating social capacity, connectedness, trust and reciprocity. Our indicators capture aspects of this latter indicator indirectly through the open qualitative responses, but it may be informative to develop some more specific questions on how involvement with groups such as ACF and ABC influences the level of perceived social capital in the area. For example, successful community initiatives can have a positive influence on social bonding, trust and confidence leading to a willingness and enthusiasm to take on new activities and challenges, bringing about further success (McMorran et al., 2014). It will be important to continue the trust-building process between WT, ACF and the wider community as the early stages of projects and partnerships create some uncertainty about how success and benefits will be achieved. As the restoration progresses, there is scope to reflect formally on the success and/or challenges associated with community capacity and engagement at Arkaig and consider how the local experience may help to inform/support the wider policy agenda relating to community engagement in decisions related to land (e.g. the recent Scottish Land Commission guidance on community engagement<sup>1</sup> and the Land Rights and Responsibilities Statement<sup>2</sup>).

Prior to this study, Woodland Trust staff had completed a stakeholder mapping exercise to evaluate their relationships with stakeholders in relation to the restoration plans. This covered aspects such as stakeholders' roles in the project, their level of influence and interest, levels of support for the project and a plan for communication and engagement. It is likely that these relationships have changed since the earlier stages of project development and it was suggested that repeating this exercise at regular intervals (6 monthly or annual intervals) would provide an effective means of monitoring stakeholder and community engagement in the restoration. The stakeholder analysis gives some measures concerning the formal relationships and interactions Woodland Trust has with project partners and other organisations but a more detailed analysis will allow for better planning for communication and engagement.

Another aspect that was not fully captured was the perception of Woodland Trust staff towards general community awareness and support for the project. Two questions were asked of Woodland Trust staff following the presentation of the study findings: 1) How high do you think community awareness of the Loch Arkaig Restoration is? 2) How supportive do you feel the community is of the restoration project? The staff present agreed that both awareness and support are currently high (selecting a score of 4 for both on a scale from 1: very low to 5: very high). Reflecting on these questions at regular intervals (6 monthly or yearly) may be useful for staff (not just core Loch Arkaig staff, but members of the wider project team) alongside a more in-depth analysis of specific relationships.

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<sup>1</sup> <https://landcommission.gov.scot/lrrs/communityengagement/>

<sup>2</sup> <https://landcommission.gov.scot/lrrs/>

The ways in which socio-economic monitoring should be conducted as the restoration progresses was discussed. The investment required to secure a good level of participation in the baseline study was quite high. The community is small and it is important to avoid stakeholder fatigue by requesting participation in research studies in addition to forest management activities. It is worth noting that a subset of the community respondents indicated that they did not wish to be involved in further research related to Loch Arkaig. The community survey used as part of this baseline study was fairly long, requiring around 20 minutes for respondents to complete, and while it was useful to collect information in depth at the outset, we recommend that ongoing monitoring should require less time investment for participants. To this end, it would be useful to combine monitoring activities with other events associated with the restoration project. For example, simplified questionnaires could be handed out at community meetings. It was agreed during the meeting that it would be useful to conduct monitoring to understand community responses to particular changes and developments associated with the restoration, for example bridge construction, commencement of timber extraction etc. It may be optimal to collect community responses a year after major changes, in order that data does not only reflect reactions to immediate disturbance and upheaval e.g. the untidy appearance of construction works and the 'newness' of completed infrastructure. Woodland Trust staff may find it helpful to develop a socio-economic monitoring plan based on planned activities.

General perceptions of support for the restoration project and comments and concerns about impacts could be collected at information meetings. As new activities (e.g. volunteering opportunities) are introduced, it will be timely to collect new data on wider attitudes towards these activities. As ecological change takes place in the longer term, there will then be opportunities to repeat information gathering about the ways in which the community values the natural heritage of the area. The very high importance of nature and wildlife established in the baseline study indicates that there is considerable scope to explore in more depth the benefits of engaging with specific landscapes, habitats and species. Previous research conducted by a member of the study team shows that people experience a variety of wellbeing benefits in places where particular species and habitats are present (Bryce et al. 2016). It may also be useful to consider assessing the wider societal value of Loch Arkaig Pine Forest by evaluating awareness and support for the project among those outside the local community. This could be done by assessing the engagement of the wider public with the project; through visits to the website or potentially through interactive online forums attached to the website – an idea that was briefly discussed in the management reflection meeting. Survey questions could also be addressed to the wider Woodland Trust membership and donor community. A further way of collecting ongoing information about the visitor experience at Loch Arkaig Pine Forest could be through the availability of short paper questionnaires on paper or postcards where visitor information is posted at the local Forest School. Alternatively, this could be developed as part of a digital engagement strategy, either through an interactive website or as part of a mobile-phone based app.

iii) Broader questions linked to the indicators (Section 6.3) and future planning were posed at the end of the manager reflection session. The questions posed were considered useful although more time would be needed to reflect on how they could guide and inform management.

- *What will be key/realistic economic activities in the next five years?*

Short-term aims to implement activities that deliver or begin to deliver economic returns for the Arkaig project would provide evidence that the forest is already starting to work for the community and has the potential to generate meaningful income. Apart from the extraction of timber, other activities and economic impacts e.g. woodlots/woodfuel, have remained aspirational and vague, therefore setting a relatable short-term action plan for the next five years may turn some community

members into active forest members. Spin-off activity and development from the forest operations would be an obvious short-term connection to economic impact. Another consideration would be how to mentor local residents in developing entrepreneurial mind-sets and taking forward ideas in response to the opportunities that the restoration presents.

- *Balancing the development of forest activities alongside the desire for low visitor numbers?*

This taps into a core issue that resonates at the heart of the community, the dichotomy between development, infrastructure, increased economic prosperity and simultaneously wishing for the area to remain relatively quiet and undisturbed with minimal or low visitor numbers. Such a mentality relates to existence value of the forest and wider area for the residents where the tranquillity and refuge created by the remoteness is part of the reason for living in this area. However, Arkaig is expected to have low visitor impact unlike recreational forests focused around visitor attractions. There may be particularly low numbers of visitors during restoration, phased operations and establishment periods of the Arkaig Pine Forest.

- *Managing expectations and communicating responsibility?*

This represents a vital disconnect and potential source of misunderstanding and frustration from both sides. Due to the scale of the project and the small size of the community, especially active community members (ABC – ACF) the undertaking is both daunting and intimidating. The thought that they might bear the entire responsibility for bringing visions and aspirations to fruition might overpower incremental efforts and actions that create impetus. The transition from securing funding and having a distant vision to executing that vision might create a low point for community morale, as aspirations become reality. Establishing where the Woodland Trust responsibilities end and the communities' begin would perhaps help guide more streamlined thinking about the project and curb some of the individuals concerns. A community strategy/management plan would provide direction and anchor people to areas of the forest, phases of time and even particular objectives. Defining these lines of communication, as well as the appropriate forum for feedback and even a type of social counselling would focus the relationship boundaries.

- *Increasing interest in the forest from locals – the potential for becoming stewards?*

Many of the local residents claim interest in the forest but have not visited the forest very frequently and normally only in limited areas. The future role of residents/locals in the forest's development could be at risk of suffering from detachment from the resource. Ideally, residents will be connected to the forest and invested in their management and products, as well as seeing the health of the forest reflected in the community. Forest ambassadors or stewards who have a duty of care toward the forest due to the significance it holds for them personally and for the wider community can be a powerful motivator. However these connections need to develop over time and connections need to be forged through activity and knowledge about important issues to the community.

- *How can partnerships support and inform Arkaig management?*

Currently partnership between the Woodland Trust, ABC and ACF supports the forest restoration project. Successful landscape projects, especially those with a strong community element rarely thrive without a range and variety of partners. The question to pose is what type of partners will benefit Arkaig and help the forest and community move forward in various stages, whether permanent or temporary. Such partners could include the pinewoods managers' network, other community forests and local businesses.

- *What is the role of education and bringing the forest to the wider public?*

The community members have spoken about the role of education and interpretation in the restoration of the forest identifying school visits, field sites, visiting groups for educational purposes, as an area that has wide scope for development. The Osprey webcam is evidence of a successful educational and public outreach resource that requires no visitors to the physical site and a similar approach could be taken to the forest operations and restoration stages. Traditional in-situ education might be limited to small groups and the locals, however online and remote education through interactive online platforms could be the most powerful tool. Education of the local residents about the forest could be communicated through engaging interactive tools. For example, storyboard in ArcMap Pro is a tool increasingly used to demonstrate projects and run consultations with communities for new developments. One point to consider is whether education of small groups with forest stewards can occur before the local community or residents have gained a certain level of knowledge about the forest.

- *Missing skillsets for a resilient Arkaig community?*

As Arkaig is a small community it is vulnerable to small changes in the community composition. Diversity is required to sustain and grow healthy communities, so what does Arkaig need to be a healthy community for five years and into the next twenty years? Age-succession, employability, interlinked skillsets (supply chain thinking), diversity of housing opportunity, upgraded infrastructure (roads, facilities and broadband etc.), as well as a self-sustaining but connected economy will strengthen the area's resilience. Where are the current gaps and concerns for Arkaig's resilience? In regard to the forest's social-ecological resilience, is there an intention to monitor the forest for pest and pathogens and high risks threats that could undermine key species? Social monitoring and use of such tools as Observatree could aid such activities. However the community would need workshops or training in identifying signs of threats and how to appropriately act.

- *Does the forest have a responsibility to societal well-being?*

Forests are recognised as valuable to the health and well-being of society, whether for an individual's mental health or for the physical health of a whole community. To what extent does Arkaig want to tap into this zeitgeist of well-being for the wider public and do the current residents recognise or acknowledge the potential powerful narrative for attracting visitors and developing business opportunities? Such products could relate to sessions that not only use the tranquil environment but guide visitors in the sensory experience of the forest and how that directly links to ecological processes (for example aromas of resin and allelopathic response, tactile exercises that explore the horizons of the leaf litter and soils etc.). A potential partnership with Highlife Highland and NHS Highland for rehabilitation and green prescriptions could be one route to explore.

- *Are the current range of ecosystem services being fully realised?*

Ecosystem services provided by Arkaig are expected to be enhanced in the future by restoration and management activities. In what way does the community want to identify and benefit from ecosystem services? Do they want to receive recognition and payments for such services through voluntary market mechanisms? Additionally, are there particular services the community would prefer to recognise and enhance that fit with Arkaig's profile? Carbon, water and air would be the main ecologically focused bundles of services. However Arkaig has the potential for tapping into greater social capital and finding ways in which to demonstrate this capacity and change over time could be important to highlighting the wider value of restoration.



- *Long-term monitoring species, habitats, plots, visitors and local perceptions of change and benefit?*

To what extent does the Woodland Trust and ACF want to connect to longer-term monitoring and which species/habitats are seen as key to Arkaig's interests? Will long-term plots be established for ecological and economic monitoring, who will be responsible for the monitoring and what skills will be required? The potential for changes over both time and forest area can be perceived differently by a range of stakeholders, which may impact both management and decision-making. How is benefit perceived over time in response to different management activities?

## 8 Conclusions and recommendations

### 8.1 Conclusions

- The study collected clear evidence of the current value of Loch Arkaig Pine Forest for the local community and businesses involved in the project. Engagement of the community with Loch Arkaig is generally good and there is scope for further involvement with forest management activities and volunteering as the restoration progresses.
- The natural heritage of Loch Arkaig Pine Forest is of very high importance to the local community. The wild and remote character of the area is also highly valued.
- Business activities are currently limited in the area but there is clear potential for the restoration to provide new opportunities, building upon existing activities. There is some concern among the community about the prospect for negative impacts but at the same time, community members readily suggested ideas for economic activity e.g. timber products, non-timber products.
- There is a clear potential for visitor activities but the overall feeling is that a large increase in visitor numbers would not be welcomed. Instead, there is more support for providing opportunities for forest education and lower impact adventure expeditions for visitors with a genuine desire to experience the forest, which would not require significant increases in infrastructure and facilities.
- The relationships that the Woodland Trust has developed at Loch Arkaig with key partners and the wider community appear to be very positive, forming a good foundation for collaboration and engagement and marking a successful start for the restoration project. The high level of interest and good-will is an early 'good news' story for Loch Arkaig that may already provide inspiration for other projects. Efforts to maintain the good communication which has been established and continued efforts to engage the community in the project, especially over issues where there are ongoing tensions will be important for the success of the project.

## 8.2 Recommendations for enhancing socio-economic outcomes

### Ongoing monitoring

- Implement ongoing socio-economic monitoring to capture responses to key stages of the restoration e.g. timber extractions, including a suitable time period to allow initial change to be processed by respondents. A socio-economic monitoring plan should be drafted in the light of confirmed infrastructure and forest management plans. It is recommended that attitudes be sought a year after implementation or completion of key restoration operations.
- Repeat stakeholder analysis at 6 monthly or annual intervals to monitor relationships with key partners and stakeholders and adapt communication and engagement activities accordingly.
- Plan in depth monitoring of community attitudes to aspects of ecological change as the restoration progresses. The monitoring of responses to ecological change should be aligned with ecological surveys. A suggested timescale to seek community responses would be approximately every 4-5 years. This should capture changes in attitudes as a result of environmental change while avoiding stakeholder fatigue.

### Community engagement

- Ensure that schemes and initiatives reflect the high ecological value held by the community for Loch Arkaig Pine Forest. For example, explore the possibility for developing schemes for forest stewards and ambassadors.
- Explore schemes for the provision of mentorship and training in entrepreneurial activities to better enable the community to develop new projects/business ideas.
- Maintain regular and inclusive consultation and communication with community
- Develop forestry management education resources e.g. building on the success of the Osprey webcam to develop further digital resources to inform public and visitors about the ecology of Loch Arkaig and the restoration process.
- Explore opportunities for training schemes on biosecurity. Residents and visitors could be involved in an early-warning reporting system for any pests and pathogens.
- Identify and develop means to engage with primary and secondary schools, colleges and higher education institutions.
- Explore the opportunity to develop a forestry skills centre to upskill local users, residents and volunteers.
- Monitor attitudes and responses to specific forest initiatives as restoration progresses to gain an ongoing understanding of socio-economic impacts.

### Wider contribution to woodland restoration

- Develop best practice community engagement and use local experiences to inform wider policy discussions about engaging communities in decisions related to land.
- Identify opportunities to convey lessons learned from community engagement at Loch Arkaig through the coordination of and participation in fora and conferences on woodland restoration in Scotland.
- Assess the engagement of the wider public with the project; through visits to the website or through the development of interactive online forums attached to the website

### **Future research**

- Explore the considerable potential for research to be conducted alongside the restoration project. There is rich scope for projects from undergraduate to PhD level study on both the social and ecological aspects of the restoration. There are specific opportunities for socio-ecological studies that explore the response of communities to ecological change and those that address issues of forest pests, diseases and non-native species

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## **10 Appendices**

Appendix 1: Community Survey

Appendix 2: Business Survey

Appendix 3: Woodland Trust Assessment spreadsheet



## **Loch Arkaig Pine Forest Restoration – Community survey**

### *Socio-economic study (Autumn/Winter 2018)*

This survey has been designed by a team of researchers at Perth College UHI and Inverness College UHI. Its purpose is to understand how the community in and around Loch Arkaig is influenced by Loch Arkaig Pine Forest and the way it is managed.

The survey will gather social and economic measures to provide a benchmark for assessing the impact of the long term restoration of Loch Arkaig Pine Forest. The restoration is being undertaken by Woodland Trust Scotland and Arkaig Community Forest.

The survey is part of a study commissioned by the Woodland Trust

All data will be treated and analysed as personal and stored securely on a server at the University of the Highlands and Islands. No personally identifiable information will be used in reports or publications. Data may be shared with the Woodland Trust for the purposes of long term monitoring.

If you have any questions about this survey, please contact Rosalind Bryce ([rosalind.bryce.perth@uhi.ac.uk](mailto:rosalind.bryce.perth@uhi.ac.uk))

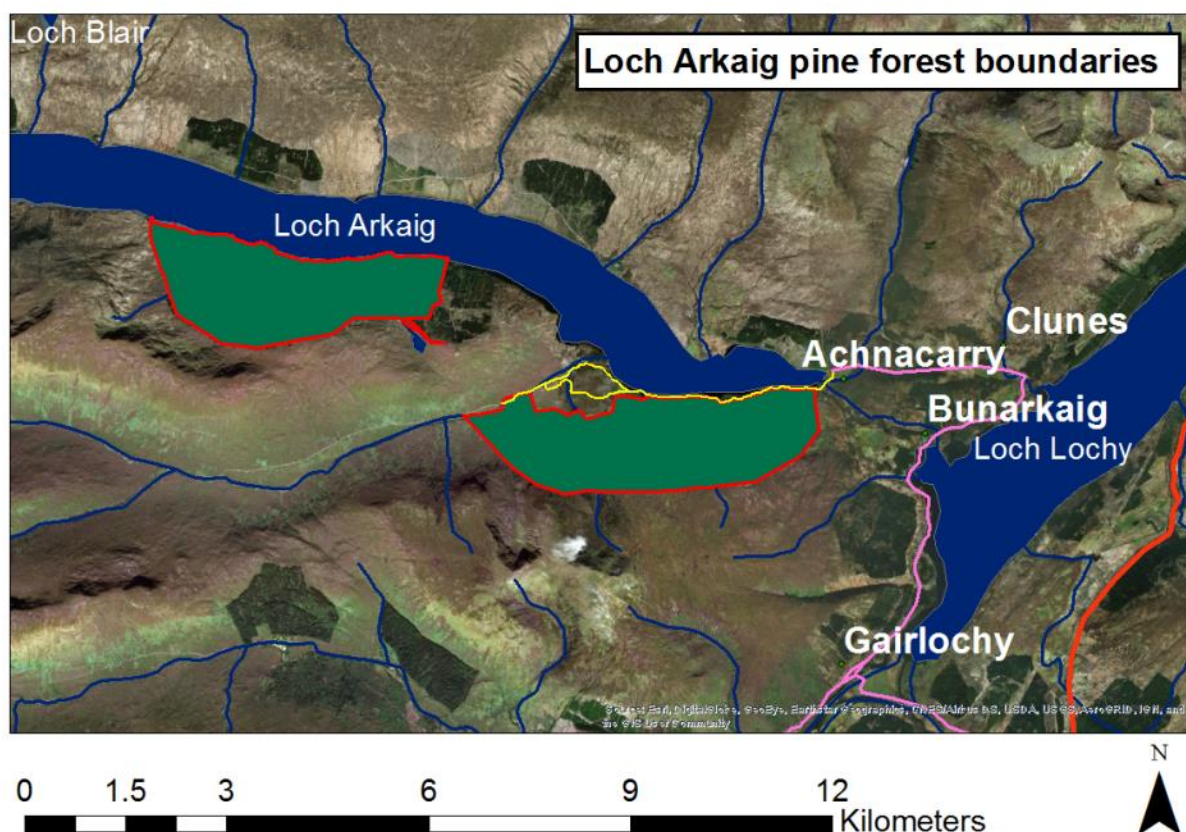
If you are willing to participate in the survey, please provide your consent below. The survey should take approximately 15-20 minutes to complete. You are not obliged to provide answers to all questions, but to help us gather a high quality data set please answer as many of them as you are able.

1. I am willing to participate in this survey (please tick)

☐ Yes    ☐ No



Map showing the boundaries of Loch Arkaig Pine Forest – over the next 20 years and beyond, the two blocks identified below will be restored to native woodland.



### Part 1. Information about you

2. What is your postcode? (this information will help us understand how people living in different areas are affected by Loch Arkaig Pine Forest and its management)

3. How old are you?

☐ Under 18   ☐ 18-25   ☐ 26-40   ☐ 41-55   ☐ 56-65   ☐ 66 and over

4. Are you

☐ Male   ☐ Female   ☐ Prefer not to say

5a. What is your employment status?

☐ Employed full-time   ☐ Retired  
☐ Employed part-time   ☐ Student  
☐ Self-employed full-time   ☐ Homemaker  
☐ Self-employed part-time   ☐ Other (specify below)  
☐ Unemployed

5b. If you are employed, what is your sector of employment?

- |  |   |
|--|---|
| <input type="checkbox"/> Public administration                 | <input type="checkbox"/> Retail and wholesale |
| <input type="checkbox"/> Financial and professional services   | <input type="checkbox"/> Construction         |
| <input type="checkbox"/> Other services (health, social, etc.) | <input type="checkbox"/> Agriculture          |
| <input type="checkbox"/> Transport and communications          | <input type="checkbox"/> Forestry             |
| <input type="checkbox"/> Hotels and catering                   | <input type="checkbox"/> Game management      |
| <input type="checkbox"/> Other (specify below)                 |   |

6. Are you a member of the Arkaig Community Forest group?

- ☐ Yes ☐ No

If yes, which category of membership do you hold?

- ☐ Full member ☐ Associate member

Please expand on your answer if you wish

7. Are you a member of any other community groups in the Loch Arkaig area? For example, Achnacarry, Bunarkaig and Clunes (ABC) community group.

- ☐ Yes ☐ No

If yes, please specify:

## Part 2. Your use of Loch Arkaig Pine Forest

8. How often do you visit Loch Arkaig Pine Forest?

- ☐ Daily ☐ Weekly ☐ Monthly ☐ A few times a year ☐ Once this year  
☐ I have not been this year ☐ Never

9. If you have visited Loch Arkaig Pine Forest during the last year, how much time have you typically spent there per trip?

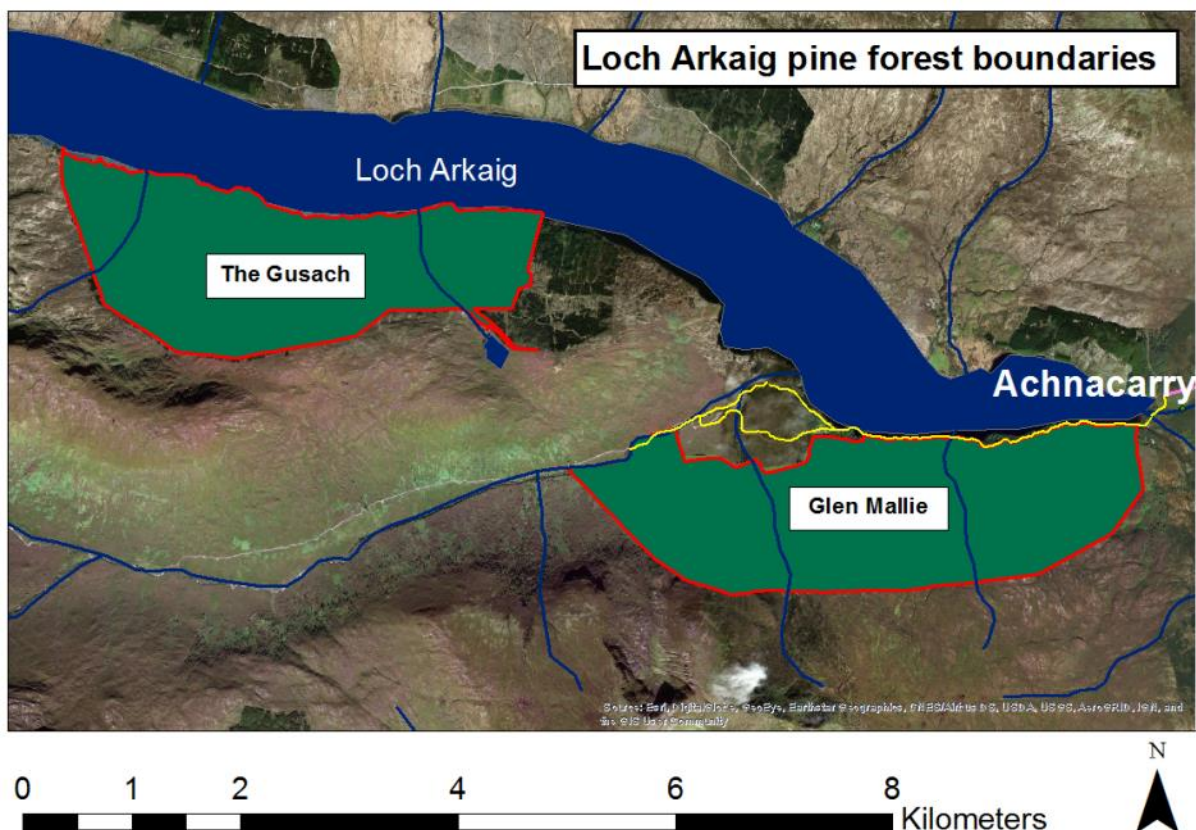
- ☐ Up to one hour ☐ 1-5 hours ☐ 1 day ☐ Multiple days ☐ Not visited  
☐ Other (specify below)

10. Why do you visit Loch Arkaig Pine Forest? (*Please tick all that apply*)

- |  |  |
|--|--|
| <input type="checkbox"/> To go walking             | <input type="checkbox"/> To carry out paid work                            |
| <input type="checkbox"/> To walk the dog           | <input type="checkbox"/> To volunteer/take part in conservation activities |
| <input type="checkbox"/> To see nature/wildlife    | <input type="checkbox"/> Other (please specify)                            |
| <input type="checkbox"/> To take photographs       |  |
| <input type="checkbox"/> To stay in bothy          |  |
| <input type="checkbox"/> To spend time with others |  |
| <input type="checkbox"/> To enjoy time alone       |  |

11. Have you visited the following areas in the last 12 months – see map below? (*Please tick all that apply*)

- |  |   |
|--|---|
| <input type="checkbox"/> Forest track from Achnacarry to Invermallie Bothy | <input type="checkbox"/> I am unsure which areas of forest I have visited |
| <input type="checkbox"/> Glen Mallie Forest                                | <input type="checkbox"/> Other (specify below)                            |
| <input type="checkbox"/> The Gusach Forest                                 |   |
| <input type="checkbox"/> Arkaig Community Forest area in Glen Mallie       |   |
| <input type="checkbox"/> Arkaig Community Forest area in The Gusach        |   |



12. Please add any additional comments about your responses in Part 2.

### Part 3. Restoration of Loch Arkaig Pine Forest

13. Are you aware of the planned restoration of Loch Arkaig Pine Forest?

☐ Yes ☐ No ☐ Not sure

14. How interested are you in the restoration of Loch Arkaig Pine Forest?

- |   |  |
|---|--|
| <input type="checkbox"/> Very interested  | <input type="checkbox"/> Not very interested   |
| <input type="checkbox"/> Quite interested | <input type="checkbox"/> Not at all interested |
| <input type="checkbox"/> Not sure         |  |

Please expand on your answer if you wish

14. If you have sought information about Loch Arkaig Pine Forest, where did you find it?  
(Please tick all that apply)

- |  |  |
|--|--|
| <input type="checkbox"/> Friends/neighbours              | <input type="checkbox"/> Newspapers/newsletters        |
| <input type="checkbox"/> Arkaig Community Forest group   | <input type="checkbox"/> Social media                  |
| <input type="checkbox"/> People working in the forest    | <input type="checkbox"/> I have not sought information |
| <input type="checkbox"/> Woodland Trust staff            | <input type="checkbox"/> Other (please specify)        |
| <input type="checkbox"/> Woodland Trust website          |  |
| <input type="checkbox"/> Arkaig Community Forest website |  |
| <input type="checkbox"/> Local events                    |  |

#### Part 4. Loch Arkaig Pine Forest and the local economy

16. Please respond to the statements below by ticking **one** box per statement

	Strongly agree	Agree	Don't know	Disagree	Strongly disagree
Loch Arkaig Pine Forest provides employment opportunities locally	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loch Arkaig Pine Forest provides economic benefits for local businesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loch Arkaig Pine Forest has little impact on the local economy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
There is a lack of local employment opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

17. Have you done any paid work at Loch Arkaig Pine Forest since January 2016?

☐ Yes ☐ No ☐ Not sure

If yes, please explain what type of work you have done

The following five questions ask you to consider how various activities which are either ongoing at Loch Arkaig, or may increase in the future, affect you. Please select one answer per row.

18. How do you feel that **tourism and recreation** at Loch Arkaig Pine Forest affects you?

<i>Tourism and recreation</i>	Positive impact at present time	Expected positive impacts in future	No impact	Negative impact at present time	Expected negative impact in future
Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. How do you feel that **timber production**, including the movement of timber lorries, at Loch Arkaig Pine Forest affects you?

<i>Timber production</i>	Positive impact at present time	Expected positive impacts in future	No impact	Negative impact at present time	Expected negative impact in future
Impact	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

20. How do you feel the availability of **wood fuel and woodlots\*** at Loch Arkaig Pine Forest affects you? (\* small parcels of forest leased and managed for timber by community members).

<i>Availability of wood fuel and woodlots</i>	Positive impact at present time	Expected positive impacts in future	No impact	Negative impact at present time	Expected negative impact in future
Impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

21. How do you feel that **non-timber production** from Loch Arkaig Pine Forest affects you, e.g. food such as venison, foraging activities?

<i>Non-timber production</i>	Positive impact at present time	Expected positive impacts in future	No impact	Negative impact at present time	Expected negative impact in future
Impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. How do you feel that activities to develop **forest skills and knowledge** at Loch Arkaig Pine Forest affect you?

<i>Forest skills and knowledge</i>	Positive impact at present time	Expected positive impacts in future	No impact	Negative impact at present time	Expected negative impact in future
Impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Part 5. Community involvement with Loch Arkaig Pine Forest

23. Have you carried out any voluntary work related to Loch Arkaig Pine Forest?

☐ Yes ☐ No ☐ Not sure

If yes, please explain more about the work you have done, and the year(s) you did this.

24. How often do you volunteer?

- ☐ Daily
- ☐ Weekly
- ☐ Monthly
- ☐ Once a year

- ☐ I do not volunteer
- ☐ Other (please specify)

25. What factors have influenced your decision about whether or not to take part in voluntary work?

26. Would you be interested in future volunteering activities related to Loch Arkaig Pine Forest?

- ☐ Yes ☐ No ☐ Not sure

If yes, what specific volunteering activities would you like to take part in?

27. Have you taken part in any events or projects/initiatives associated with Loch Arkaig Pine Forest?

- ☐ Yes ☐ No ☐ Not sure

If yes, please provide details.



28. Have you participated in any other way in the management of Loch Arkaig Pine Forest and the forest restoration project?

☐ Yes ☐ No ☐ Not sure

If yes, please tick all that apply

- ☐ Undertook paid work
- ☐ Participated in consultations
- ☐ Contributed to planning/decision-making
- ☐ Attended local meetings/talks
- ☐ Helped to organise local events
- ☐ Raised awareness
- ☐ Took part in forest skills training

☐ Participated in forest monitoring and/or research/data collection related to the forest

☐ Other (please specify)

29. Has Loch Arkaig Pine Forest allowed you to develop new skills?

☐ Yes ☐ No ☐ Not sure

If yes, what skill(s) have you developed?

30. Please indicate the extent to which you or members of your family would benefit from taking part in potential future opportunities for young people at Loch Arkaig Pine Forest. Please rank each opportunity from 5 (very beneficial) to 1 (not beneficial at all). Select one answer per row.

	5	4	3	2	1
School visits to forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Awareness raising of Loch Arkaig Pine Forest in schools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Development of educational resources for children/schools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Duke of Edinburgh activities at Loch Arkaig Pine Forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work experience opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Training courses for young adults	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Apprenticeships	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Field courses/research project opportunities for College/University students	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outdoor skills/bushcraft courses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



31. How important to you are the following aspects of Loch Arkaig Pine Forest? Please rank the following from 5 (Very important) to 1 (Not at all important). Select one answer per row.

***Nature and wildlife***

	5	4	3	2	1
Presence of specific native fauna e.g. ospreys, sea eagles, otters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Presence of native trees and other native vegetation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diversity of habitats, plants and animals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Condition and health of forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

***Recreation and cultural importance***

	5	4	3	2	1
Aesthetic landscape quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Quiet and tranquil environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Place for recreation e.g. walking, camping	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Well maintained paths and tracks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Remoteness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
History of the forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information available online about Loch Arkaig Pine Forest e.g. website, web-cams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Information available at Loch Arkaig Pine Forest e.g. interpretation board, publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

***Community involvement and education***

	5	4	3	2	1
Opportunity for involvement in forest management through community engagement and community ownership	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunities to develop new business ideas that will provide local income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity for woodlots in forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A place for young people to learn about forests and nature	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Part 6. Natural and cultural value of Loch Arkaig Pine Forest

32. If you visit Loch Arkaig Pine Forest, do you do so with the hope of seeing specific species of animals and plants?

☐ Yes ☐ No ☐ Not sure

If yes, which species?

Have you seen these species in the last 12 months? Please give details.

33. Do you have concerns about changes to plants and animals at Loch Arkaig Pine Forest in the future?

☐ Yes ☐ No ☐ Not sure

Please explain your answer.

34. Have you viewed the Loch Arkaig Osprey Cam online?

☐ Yes ☐ No ☐ Not sure

35. Have you visited the Woodland Trust Loch Arkaig Pine Forest website?

☐ Yes ☐ No ☐ Not sure

35. Have you visited the Arkaig Community Forest website?

☐ Yes ☐ No ☐ Not sure

Please add any further comments you have on any aspect of this survey.

38. Would you be willing to participate in future research related to the Loch Arkaig Pine Forest restoration project?

☐ Yes ☐ No

If yes, please add your email address (optional).

Thank you for completing the survey.

Please contact Steve Morris ([SteveMorris@woodlandtrust.org.uk](mailto:SteveMorris@woodlandtrust.org.uk)) if you have any queries about the Loch Arkaig Pine Forest restoration project.

You can also complete the survey at online at the following link:

<https://uhi.onlinesurveys.ac.uk/loch-arkaig-pine-forest-community-survey>





### **Loch Arkaig Pine Forest Restoration – Business survey**

*Socio-economic study (Autumn/Winter 2018)*

This survey has been designed by a team of researchers at Perth College UHI and Inverness College UHI. Its purpose is to understand how businesses in the vicinity of Loch Arkaig are influenced by Loch Arkaig Pine Forest and the way it is managed.

The survey will gather social and economic measures to provide a benchmark for assessing the impact of the long term restoration of Loch Arkaig Pine Forest. The restoration is being undertaken by Woodland Trust Scotland and Arkaig Community Forest.

The survey is part of a study commissioned by the Woodland Trust

All data will be treated and analysed as personal and stored securely on a server at the University of the Highlands and Islands. No personally identifiable information will be used in reports or publications. Data may be shared with the Woodland Trust for the purposes of long term monitoring.

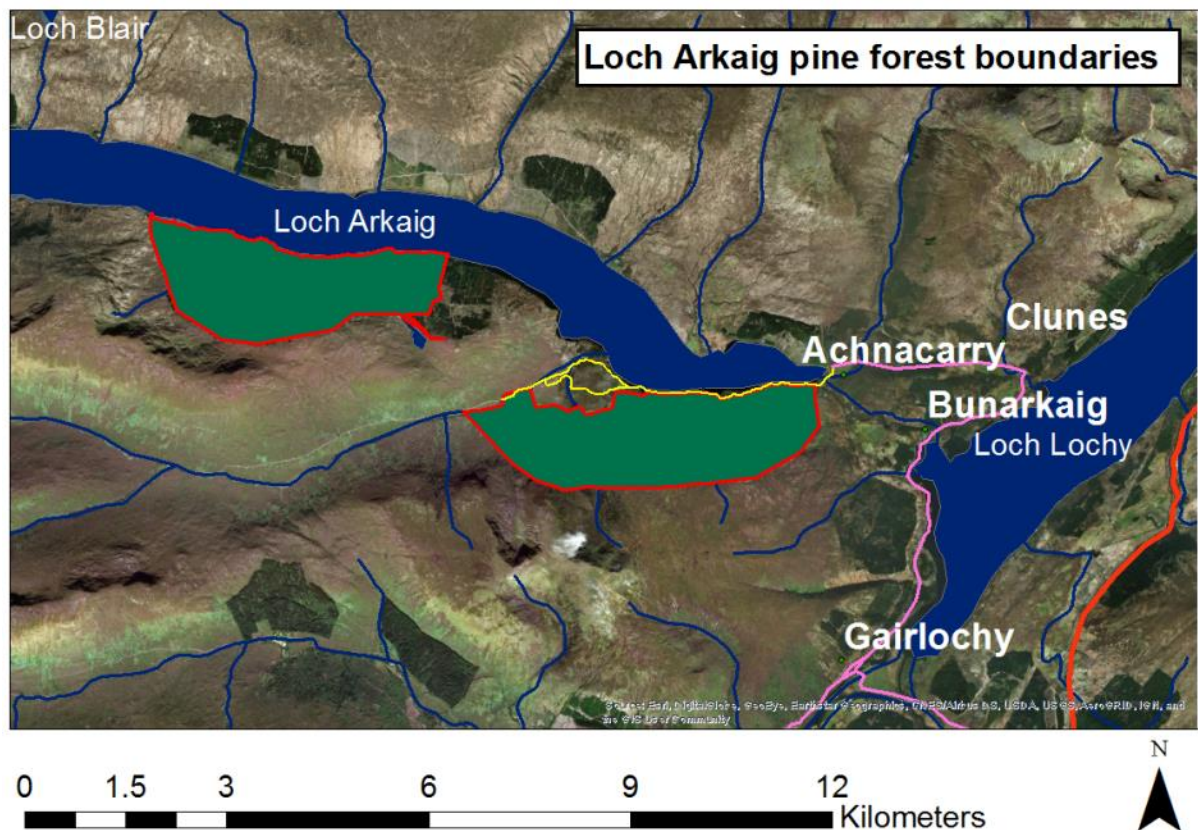
If you have any questions about this survey, please contact Rosalind Bryce ([rosalind.bryce.perth@uhi.ac.uk](mailto:rosalind.bryce.perth@uhi.ac.uk))

If you are willing to participate in the survey, please provide your consent below. The survey should take approximately 10 minutes to complete. You are not obliged to provide answers to all questions, but to help us gather a high quality data set please answer as many of them as you are able.

1. I am willing to participate in this survey (please tick)

☐ Yes    ☐ No

Map showing the boundaries of Loch Arkaig Pine Forest – over the next 20 years and beyond, the two blocks identified below will be restored to native woodland.



## Part 1. About your business

2. What is the name of your business?

3. What products and/or services do you provide?

4. How long has your business been in existence?

5. Where is your business located?

6. What is the postcode of your business?



7. Where is your main place of operation or customer catchment?

8. How many people do you employ?

Please provide numbers of employees in the following categories

Full-time	
Part-time	
Seasonal	
Casual	
Other (please specify)	

9. Please provide an indication of your annual turnover if you are willing to do so

## Part 2. Loch Arkaig Pine Forest

*Please answer the following questions about your business and Loch Arkaig Pine Forest*

10. Do you supply goods and services for site and forest management at Loch Arkaig Pine Forest?

☐ Yes ☐ No ☐ Not sure

Please expand on your answer if possible

If you answered yes, approximately what proportion of your business income would you estimate is related to Loch Arkaig Pine Forest? Please estimate for each relevant good/service if possible.



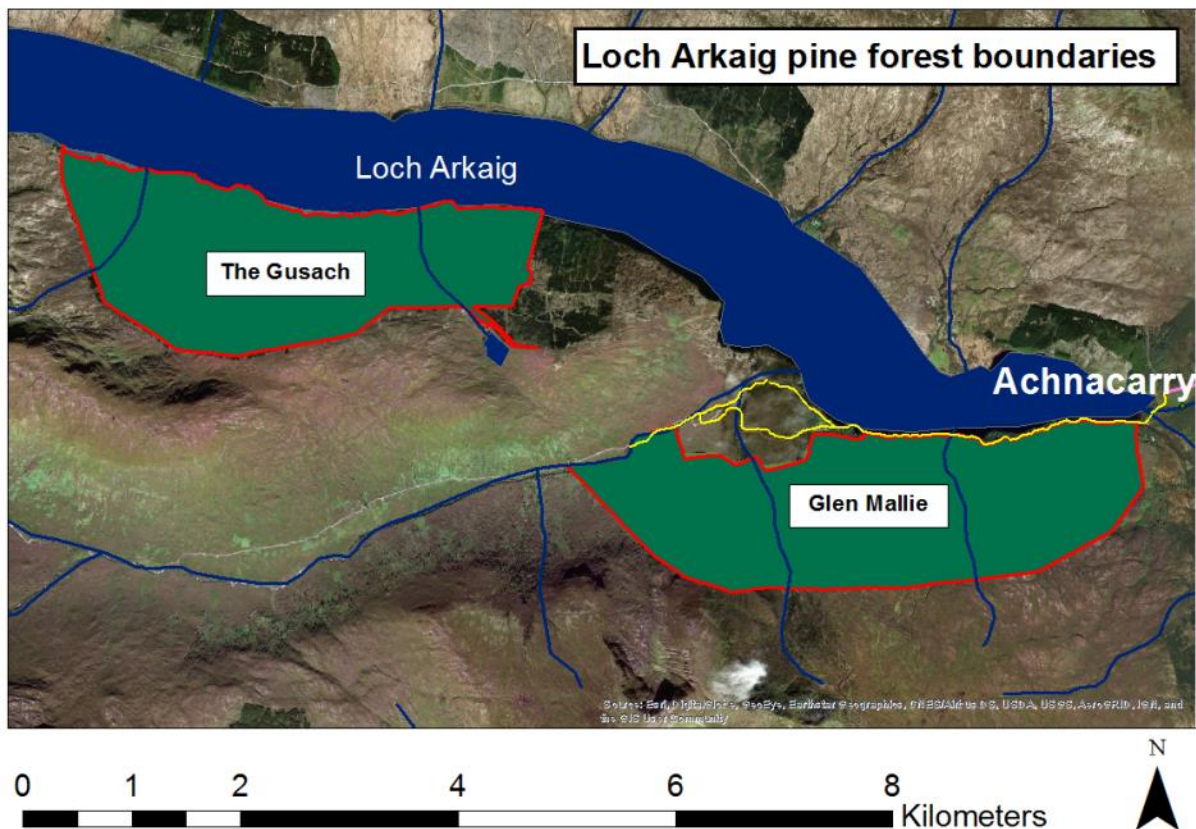
11. Do you use Loch Arkaig Pine Forest for your business activities (this could include physical use of the forest and resources or use for branding purposes).

☐ Yes ☐ No ☐ Not sure

If yes, please explain your answer.

12. Is your business used by people who visit or work in Loch Arkaig Pine Forest?

☐ Yes ☐ No ☐ Not sure



Please expand on your answer if possible.

13. Has Loch Arkaig Pine Forest had any impact on the start-up or development of your business?

☐ Yes ☐ No ☐ Not sure

Please expand on your answer if possible.

14. Are you aware of the forest restoration plans at Loch Arkaig?

☐ Yes ☐ No ☐ Not sure

If yes, what impacts do you expect the restoration to have on your business?

If yes, what impacts do you expect the restoration to have on other local businesses?

15. Please add any other relevant comments to complement your responses to this survey.

16. Would you be willing to participate in future research related to the Loch Arkaig restoration project?

☐ Yes ☐ No

If yes, please provide your email address

Thank you for completing the survey.

Please contact Steve Morris ([stevemorris@woodlandtrust.org.uk](mailto:stevemorris@woodlandtrust.org.uk)) if you have any queries about the Loch Arkaig Pine Forest restoration project.

You can also complete the survey online at the following link:

<https://uhi.onlinesurveys.ac.uk/loch-arkaig-pine-forest-business-survey>



## Appendix 3 Woodland Trust Assessment

<b>Loch Arkaig Pine Forest</b>
<i>Socio-economic measures</i>
Please complete the sheets in this workbook. Each sheet requests data relevant to some of the social and economic measures that are being considered as part of the monitoring project being conducted by UHI.
This workbook contains five sheets:
<b>1. Economic contribution</b>
<b>2. Community and partnerships</b>
<b>3. Volunteering and skills development</b>
<b>4. Wellbeing and cultural value</b>
<b>5. Other ecosystem services</b>
Where possible, include data since 2017.

Economic contribution			2017	2018	2019	2020	2021
<b>Staff</b>							
Proportion of WT staff time working on/at LAF (% of FTE)	Staff name 1	% of FTE					
	Staff name 2	% of FTE					
	Staff name 3	% of FTE					
	Staff name 4	% of FTE					
	Staff name 5	% of FTE					
Value of WT staff time (£)	Staff name 1	Value (£)					
	Staff name 2	Value (£)					
	Staff name 3	Value (£)					
	Staff name 4	Value (£)					
	Staff name 5	Value (£)					
<b>Income</b>							
Income from timber products, e.g. roundwood, woodfuel (total) (£)		Income (£)					
Product type 1 - insert name here		Income (£)					
Product type 2 - insert name here		Income (£)					
Product type 3 - insert name here		Income (£)					
Income from non-timber forest products, e.g. venison (total) (£)		Income (£)					
Product type 1 - insert name here		Income (£)					
Product type 2 - insert name here		Income (£)					
Product type 3 - insert name here		Income (£)					
Income from other site activities (£)							
Income stream 1 - insert name here		Income (£)					
Income stream 2 - insert name here		Income (£)					
Income stream 3 - insert name here		Income (£)					
Income stream 4 - insert name here		Income (£)					
Income from grants (public/other) (£)							
Grant 1 - insert name here	Enter funding period	Income (£)					
Grant 2 - insert name here	Enter funding period	Income (£)					
Grant 3 - insert name here	Enter funding period	Income (£)					
<b>Expenditure</b>							
Expenditure on site activities (£)							
Expenditure 1 - insert name here		Expenditure (£)					
Expenditure 2 - insert name here		Expenditure (£)					
Expenditure 3 - insert name here		Expenditure (£)					
Expenditure 4 - insert name here		Expenditure (£)					
Value of spend with contractors (insert name and location)							
Contractor 1 - insert name here	Select location	Expenditure (£)					
Contractor 2 - insert name here	Select location	Expenditure (£)					
Contractor 3 - insert name here	Select location	Expenditure (£)					
Contractor 4 - insert name here	Select location	Expenditure (£)					
Value of spend with suppliers (£) (insert name and location)							
Supplier 1 - insert name here	Select location	Expenditure (£)					
Supplier 2 - insert name here	Select location	Expenditure (£)					
Supplier 3 - insert name here	Select location	Expenditure (£)					
Supplier 4 - insert name here	Select location	Expenditure (£)					
<b>Reach</b>							
Other businesses used by employees/contractors related to LAF (e.g. hotels)							
Business 1 - insert name here		Estimated spend (if poss)					
Business 2 - insert name here		Estimated spend (if poss)					
Business 3 - insert name here		Estimated spend (if poss)					
Business 4 - insert name here		Estimated spend (if poss)					

Community engagement and partnership working			2017	2018	2019	2020	2021
<b>Community involvement</b>							
Number of community groups formally involved in the restoration							
	Group 1 - insert name		Select	Select	Select	Select	Select
	Group 2 - insert name		Select	Select	Select	Select	Select
	Group 3 - insert name		Select	Select	Select	Select	Select
Number of local community members involved in conservation and monitoring (total)			Enter number				
<b>Wider involvement</b>							
Number of organisations formally involved in the restoration							
	Group 1 - insert name		Select	Select	Select	Select	Select
	Group 2 - insert name		Select	Select	Select	Select	Select
	Group 3 - insert name		Select	Select	Select	Select	Select
Number of formal partnerships							
	Partnership 1 - insert name of partner	Details of aims	Select	Select	Select	Select	Select
	Partnership 2 - insert name of partner	Details of aims	Select	Select	Select	Select	Select
	Partnership 3 - insert name of partner	Details of aims	Select	Select	Select	Select	Select
Number of formal interactions (e.g. other restoration projects)							
	Interaction 1 - provide detail		Select	Select	Select	Select	Select
	Interaction 2 - provide detail		Select	Select	Select	Select	Select
	Interaction 3 - provide detail		Select	Select	Select	Select	Select

Volunteering and skills development			2017	2018	2019	2020	2021
<b>Volunteers</b>							
Number of volunteers (total)			Enter number				
	Number of local volunteers (Lochaber)		Enter number of vols				
	Number of non-local volunteers (rest of Scotland)		Enter number of vols				
	Number of non-local volunteers (rest of UK)		Enter number of vols				
	Number of non-local volunteers (international)		Enter number of vols				
Number of volunteer days (total)			Enter number				
	Proportion local volunteer days (Lochaber)		Enter number of days				
	Number of non-local volunteer days (rest of Scotland)		Enter number of days				
	Number of non-local volunteer days (rest of UK)		Enter number of days				
	Number of non-local volunteer days (international)		Enter number of days				
Number of volunteers who complete more than one day (total)			Enter number				
	Proportion local volunteer days (Lochaber)		Enter number of days				
	Number of non-local volunteer days (rest of Scotland)		Enter number of days				
	Number of non-local volunteer days (rest of UK)		Enter number of days				
	Number of non-local volunteer days (international)		Enter number of days				
<b>Education</b>							
Number of educational visits (total)			Enter number				
	Primary school visits		Enter number				
	Secondary school visits		Enter number				
	Other educational visits		Enter number				
Number of local community member undertaking skills training (total)			Enter number				
	Skill 1 - please enter		Enter number				
	Skill 2 - please enter		Enter number				
	Skill 3 - please enter		Enter number				
Number of WT apprenticeships completed (total)			Enter number				
	Apprenticeship type 1 - please enter		Enter number				
	Apprenticeship type 2 - please enter		Enter number				

Wellbeing and cultural value		2017	2018	2019	2020	2021
<b>Visitors</b>						
Number of visitors (total)		Enter number				
<b>Cultural heritage</b>						
Spend related to sites of cultural importance (e.g. interpretation, maintenance)		Enter spend (£)				
Cultural site 1 - enter name here		Enter spend (£)				
Cultural site 2 - enter name here		Enter spend (£)				
Cultural site 3 - enter name here		Enter spend (£)				
<b>Volunteering and skills development</b>		2017	2018	2019	2020	2021
<b>Volunteers</b>						
Number of volunteers (total)		Enter number				
Number of local volunteers (Lochaber)		Enter number of vols				
Number of non-local volunteers (rest of Scotland)		Enter number of vols				
Number of non-local volunteers (rest of UK)		Enter number of vols				
Number of non-local volunteers (international)		Enter number of vols				
Number of volunteer days (total)		Enter number				
Proportion local volunteer days (Lochaber)		Enter number of days				
Number of non-local volunteer days (rest of Scotland)		Enter number of days				
Number of non-local volunteer days (rest of UK)		Enter number of days				
Number of non-local volunteer days (international)		Enter number of days				
Number of volunteers who complete more than one day (total)		Enter number				
Proportion local volunteer days (Lochaber)		Enter number of days				
Number of non-local volunteer days (rest of Scotland)		Enter number of days				
Number of non-local volunteer days (rest of UK)		Enter number of days				
Number of non-local volunteer days (international)		Enter number of days				
<b>Education</b>						
Number of educational visits (total)		Enter number				
Primary school visits		Enter number				
Secondary school visits		Enter number				
Other educational visits		Enter number				
Number of local community member undertaking skills training (total)		Enter number				
Skill 1 - please enter		Enter number				
Skill 2 - please enter		Enter number				
Skill 3 - please enter		Enter number				
Number of WT apprenticeships completed (total)		Enter number				
Apprenticeship type 1 - please enter		Enter number				
Apprenticeship type 2 - please enter		Enter number				