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Yorkshire Dales National Park Authority

Access & Engagement Theory of Change and Evaluation Framework Report

THE CENTRE FOR HEALTH PROMOTION RESEARCH

ANNE-MARIE BAGNALL, JENNY WOODWARD, SUSAN COAN, AND JANE

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Key Points

The aim of this work was for the Centre for Health Promotion Research (CHPR) to support the Yorkshire Dales National Park (YDNP) Authority's Access & Engagement team in developing and refining their Theory of Change (ToC) and to produce an evaluation framework. This should enable the Authority to better understand and articulate the impact of their work and assist with the planning of their future delivery.

Process (Section 1)

Three collaborative workshops were held to develop the **Theory of Change**. Wider stakeholders participated in order to ensure a diversity of perspectives. These included representatives from community groups, youth and advocacy groups, schools and volunteers, many based in deprived areas. Participants identified priority outcomes for measurements and commented on drafts.

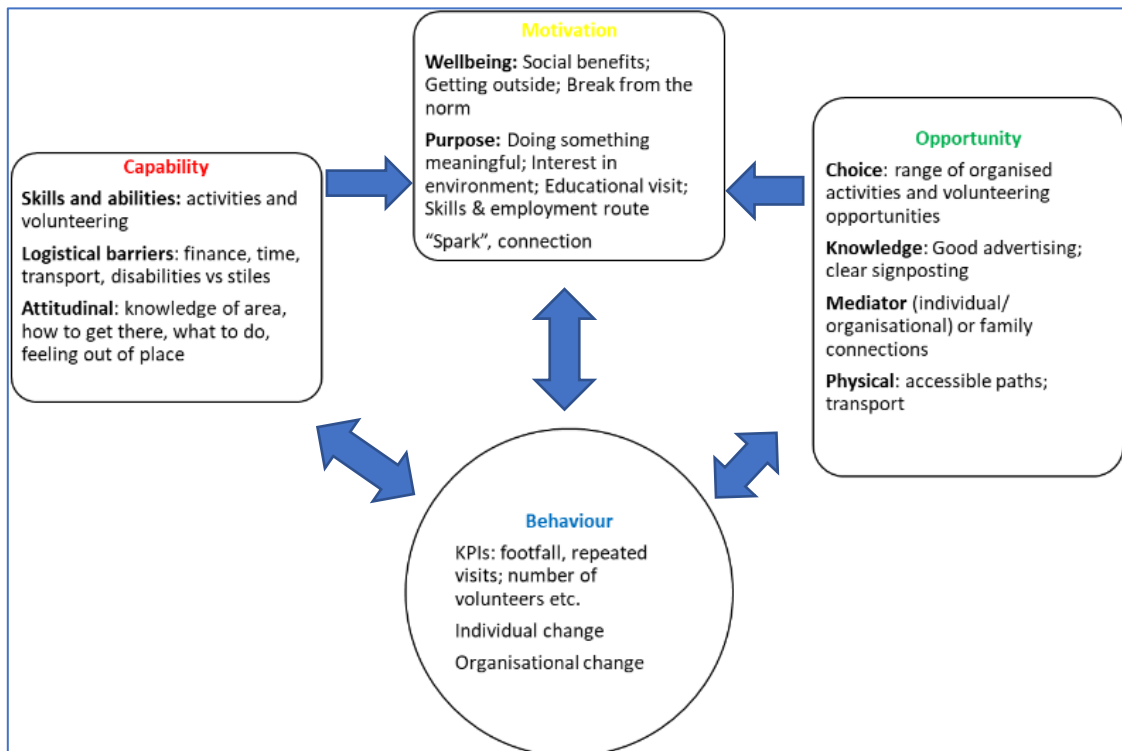
The **evaluation framework** was developed from the Theory of Change, with reference to the existing evidence base, and identified key evaluation questions. Expected outcomes (short, medium and long-term) by participant type were listed, alongside suggested measurement tools. Finally, a list of potential methods to measure these outcomes was presented.

The YDNPA Theory of Change (Section 2)

The Theory of Change outlines key steps for engagement, underpinning assumptions and outcomes for individuals, organisations and the Authority itself.

- People first become engaged with the YDNP through either structured or unstructured visits.
- Motivations to engage include improving different aspects of their wellbeing and gaining purpose or meaning.
- Barriers to engagement were categorised into logistical/economic, cultural, and attitudinal/social.
- Various external factors support lasting involvement, ranging from strong partnerships between organisations to clear communication and ensuring the National Park is welcoming to diverse groups.
- Internal factors that support lasting involvement include experiencing a 'spark' when visiting, enjoyment, a sense of connection (with others and nature) and doing something meaningful.

The COM-B Behaviour Change model was used to illustrate the three essential conditions (Capability, Opportunity and Motivation) for encouraging individuals to engage with the National Park. See Figure below.



Outcomes for individuals were grouped under: knowledge, attitude, intentions (e.g. increased understanding of nature); behaviours (e.g. visiting the National Park more); and wellbeing (social, mental, spiritual and physical).

External **organisational outcomes** (e.g. community groups) included building relationships with the YDNPA and achieving their own objectives through accessing the National Park.

Outcomes for the **YDNPA** include their agreed KPIs plus increased knowledge and understanding of the needs of underserved groups, increased volunteer numbers, improved conservation and lifelong stewardship of the National Park by visitors.

Environmental outcomes include increased knowledge and interest, in terms of other green spaces and environmental risks. Increased pro-environmental behaviours could have wider environmental impacts and lead to more responsible tourism.

The YDNPA Evaluation Framework (See Section 3)

Twelve evaluation questions were proposed – some are quantifiable (e.g., reach/return visits, health and wellbeing improvements), others are qualitative (e.g. perceptions of the visit). Process orientated questions such as the role of community organisations were also included.

1. Have the A&E team achieved their agreed annual objectives (B4, B5, B7)?
2. Are a diverse range of ‘under-represented’ groups reached by the A&E team’s activities?
3. Do participants achieve the shorter term aims outlined in the Theory of Change? Including engagement with the YDNP (knowledge, comfort, enjoyment), connection to nature, improved sleep and social connections.
4. How do participants view the experience of engaging with the YDNP A&E programme of work?
5. Does taking part in an A&E programme lead to people visiting the YDNP and other Green Space independently?
6. How does the pathway from taking part in an A&E programme lead to independent visits to YDNP/GS? What are the key facilitators and barriers?
7. What is the evidence that taking part in an A&E programme leads to increased nature connection/(pro-environmental behaviours)?
8. How does taking part in an A&E programme lead to increased connection to nature/(PEB)?
9. Do participants achieve the longer-term aims relating to improved health and wellbeing?
10. Do the benefits from participating in an A&E programme ‘ripple out’ to family, friends, the wider community?
11. What is the role of community/voluntary sector organisations in improving access and engagement amongst under-served groups? How can YDNP A&E team support/encourage their involvement?
12. Have the YDNP A&E team increased their understanding of how best to engage with under-represented groups? Has this ‘rippled out’ to YDNP more generally?

The evaluation framework is split into participant type and themes. It can be used by identifying which evaluation question needs to be answered, locating this in the framework, and then tracking this across from expected outcomes to measures and methods. Questions are numbered to aid this process.

Theme 1: Individuals’ engagement with the National Park.

Expected outcomes range from individuals gaining knowledge about the National Park/feeling welcome there, (short term) to returning independently and feeling they belong (medium-long term). Proposed measures included demographics, visit satisfaction, return visits and volunteer numbers.

Theme 2: Individuals’ connection to nature

Expected outcomes include experiencing an initial ‘spark’ or emotional response (short-term) and, medium term, spending more time in nature and feeling more connected with it. Proposed measures include an illustrated Inclusion of Nature with Self Scale and participation in local nature-based activities.

Theme 3: Individuals' health and wellbeing

Improved sleep is an important short-term outcome, whilst being more active in nature (medium term) and improved health and wellbeing overall was a key long-term outcome for individuals. Scales for health, wellbeing and social capital were suggested.

Methods to measure the individual based outcomes, were proposed including monitoring data forms, post-visit feedback forms and follow-up interviews and case studies plus additional methods such as creative workshops and peer research.

Theme 4: YDNP Authority

Short-term expected outcomes include appropriate information and communication about the YDNP and a range of activities for underserved groups, and, in the medium term, better understanding of underserved groups and improved infrastructure. Analysis of feedback forms, existing data and a range of proxy measures were proposed.

Theme 5: Organisations (e.g., community groups)

Expected outcomes include, in the short term, community groups becoming aware of the YDNP as a place to visit and gaining the skills/connections to visit and, longer-term, embedded engagement with the YDNPA.

Methods for data collection

Thirteen potential methods were proposed – each measuring a variety of expected outcomes. Those considered **important**, by the CHPR team include:

- Visit Monitoring Form (at time of visit)
- Feedback forms (post-visit) - individuals and organisations
- Follow-up interviews (3-6m post visit) – sample of individuals and organisations
- Case studies (up to 1 year post visit) – selection of individuals and organisations
- An 'audit' of A&E team's activities

Utilising existing data on volunteer and visitor numbers (if available) was suggested. Optional methods – to add more insight where needed – include peer research, creative workshops and potentially a longitudinal study.

Annotated Bibliography (See Section 4)

Existing scientific evidence – mainly systematic reviews, that collate all 'quality' evidence on a topic - is presented in Section 4. This is split into:

- The link between Green Space exposure and health (in general)
- The link between Green Space exposure and mental health/wellbeing
- The link between mental health/wellbeing and Connection to Nature
- The link between Connection to Nature and Pro-environmental behaviour
- Outcomes from volunteering in green space/environmental enhancement activities

1: The Process – How the Theory of Change and Evaluation Framework were developed

Theory of Change development

A Theory of Change (ToC) describes how interventions lead to change. It connects activities, outcomes and the context of the initiatives to give clarity around long-term outcomes and planned strategies. ToC is used to guide evaluation measurement and data collection.

Involving diverse stakeholders makes the process more robust and provides varied perspectives. Whilst short-term activities and long-term goals are often well defined in community-based initiatives, how the former lead to the latter (mechanisms and interim outcomes) is often less clear.

There are five recognised steps to develop a Theory of Change:

1. Identifying the stakeholders - Who is involved? Who stands to benefit? Who else could or should be involved?
2. Identifying and defining long-term goals
3. Identifying short-term activities linked to long-term goals
4. Exploring the steps (interim outcomes/activities) and mechanisms of change that link short-term activities to long-term goals
5. Exploring context – things that may help or hinder this process

What we did

LBU facilitated the process of developing the ToC with the Access and Engagement (A&E) team. This included three structured workshops, with draft documents circulated between for consideration.

Preparatory Workshop (February 2022)

The LBU team and the Yorkshire Dales National Park Authority (YDNPA) A&E team met to identify stakeholders, long-term goals and which short-term activities are linked to these. We shared ideas about mechanisms of change and the context.

A list of potential key stakeholders to invite to the wider workshops was generated based on the discussion.

Stakeholder Workshop 1 (March 2022)

This virtual workshop included selected wider stakeholders – eight attended ‘live’ and four fed back via email - plus the A&E team, and LBU as facilitators. There were representatives from advocacy groups, community groups/a youth group based in deprived urban areas, a community mental health group, a conservation group, schools, volunteers plus from the YDNPA Board. The following questions about the people they work with or represent were discussed:

1. How do they get involved with the YDNPA? E.g. activity days, volunteering
2. How do they stay involved/How can involvement be sustained?
 - a. Why do you think some people don't come back?
3. What changes might happen through being involved in the National Park? For people, the Park itself, and organisations (in both the short and long-term)?
4. How do those changes happen?

A draft Theory of Change document was produced by the LBU team. This was based on the workshop findings and existing health promotion models. The 'COM-B' behaviour change model was used to frame the essential conditions (categorised into Capabilities, Opportunities and Motivations) for behaviour change (e.g., visiting the YDNP more) whilst the 'Five Ways to Wellbeing' model identifies different categories of actions that lead to better wellbeing. Both models are evidence-based, adding to the validity of the ToC.

The draft Theory of Change document was shared with participants in advance of the second stakeholder workshop, to allow time for reflection.

Stakeholder Workshop 2 (April 2022)

Previous participants were invited back to continue the discussions. The draft Theory of Change was presented by the LBU team, and participants given time to comment and identify any gaps. Outcomes were identified and prioritised and potential measurements (and methods) discussed. These discussion points fed into the evaluation framework.

After the workshop the ToC was refined – see Section 2 of this document for the latest version - and the development of the evaluation framework began.

Evaluation Framework - development process

The evaluation framework aims to form the basis of future data collection and evaluation for the A&E team. It is designed to offer options that the A&E team can select from, depending on their priorities - it would be unrealistic to explore everything listed in the short-term.

The CHPR team identified twelve evaluation questions that are potentially of importance – some are relatively straightforward to answer, others more challenging. Both outcome and process related enquiries were included, for individuals and organisations.

Expected outcomes (focusing on those identified as priorities in the ToC workshops) were categorised into short, medium and long-term and arranged by stakeholder group and theme. These were mapped against the evaluation questions.

How these outcomes could be measured (including validated scales) and what methods could be used were then identified, using research method knowledge and experience.

The final evaluation framework is presented in Section 3.

Existing Evidence

The LBU team identified key scientific literature to inform the evaluation plan. They searched for evidence that links exposure to 'green space/nature environments' and improvements in individuals' mental health/wellbeing (or health overall). Where there is strong evidence, it may not be necessary for the YDNP Authority to collect their own data on that particular aspect.

The search was focused on recent systematic reviews – this is where academics identify all available evidence on a topic and assess for quality to make conclusions. They are perceived to be the highest quality of evidence.

See Section 4 for the Annotated Bibliography, including titles and summaries of relevant literature, arranged into key topics.

2: YDNP Authority Theory of Change: Key Steps and Underpinning Assumptions

1. **Starting point.** People first become engaged with the YDNP through 2 main **routes**:

- *Unstructured* (visits with family or friends – probably more common since Covid-19 and related restrictions; or self-directed, as seen on media/social media marketing)
- *Structured*
 - People book onto organised YDNP activity (usually through organisations operating in the YDNP, rather than the YDNP authority itself)
 - Attend organised visits and activities via schools or VCSOs. The organisational link seems to be vital for many under-represented groups in overcoming barriers; mediators liaise with YDNPA staff/activities.
 - Volunteering (self-selected via advertised opportunities; or as follow-on after organised group activity). Volunteering can be a one-off event (e.g. tree planting activity) or sustained engagement.

2. **Motivations for first engagement with the YDNP.** These clustered around:

- a. *Wellbeing* (social benefits, getting outside, physical benefits from exercise, having a break from the norm) and
- b. *Purpose* (doing something meaningful, taking an interest in the environment, enjoying a challenge, routes to employment through skills).

3. **Potential barriers to first engagement with YDNP.** These were identified as:

- a. *Logistical/economic* (transport, financial, physical barriers such as pathways and stiles, and time),
- b. *Cultural* (includes both logistical and attitudinal barriers such as eating (e.g. finding halal food), fear of dogs, knowing about or having the right clothes to wear
- c. *Attitudinal/social* (lack of knowledge/ awareness; ‘not for people like me’; attitudes of others being unwelcoming).

4. **External factors supporting lasting involvement:** For access and engagement for under-represented groups, the *mediating role of community groups and leaders* is felt to be very important in supporting positive changes, as is the *role of staff and volunteers*. Personal relationships foster good organisational relationships.

Partnerships/relationships between YDNPA and other organisations, such as the Wildlife Trusts, and those operating to run activities in the National Park also affect long-term involvement.

Suggestions for “two way” engagement starting in local communities (e.g. Beeston) before bringing them to the National Park. Advertising/communicating the influence and involvement of local people e.g. African and Asian communities supports belonging. Anything that makes the area *feel welcoming* and individuals *feel comfortable* helps. Clear *signage and information* about behavioural expectations improves people’s confidence to

visit. Having a *range of opportunities* on offer and making sure these are *well advertised* was also important.

Progression routes from visitor to volunteer. Offering achievements and qualifications.

Encouraging people to be more “hands on”. *Funding* – enough and sustainable - was another important factor.

5. Internal factors supporting lasting involvement. Similar factors to motivations were mentioned here. Feeling an *emotional response*, or “*spark*” when visiting the National Park was a common theme felt to be very important in bringing people back. Having *fun and enjoyment*, social connection, experiencing a *sense of connection* with others and with nature/the Park, *doing something meaningful*, and having an *interest in learning* more were all felt to be more likely to make people want to come back to the National Park. Wellbeing in the sense of social and spiritual connection was important. Seeing that they can have an influence. There was also a consistent theme of discussion around *intergenerational connections and life course involvement* – in the sense that whilst involvement in terms of visits may be infrequent, the connection with the National Park may be sustained over generations.

6. Behaviour Change Model: The themes discussed in relation to pathways of involvement with the YDNP seem to map well against the evidence-based COM-B Behaviour Change Model¹ which proposes three essential conditions for behaviour change: capability, motivations and opportunities (Figure 1).

Capability – the individual’s physical and psychological capacity to engage in the activity. Includes having the necessary knowledge or skills.

Opportunity – physical or social factors that are external to the individual that prompt the behaviour or make it possible.

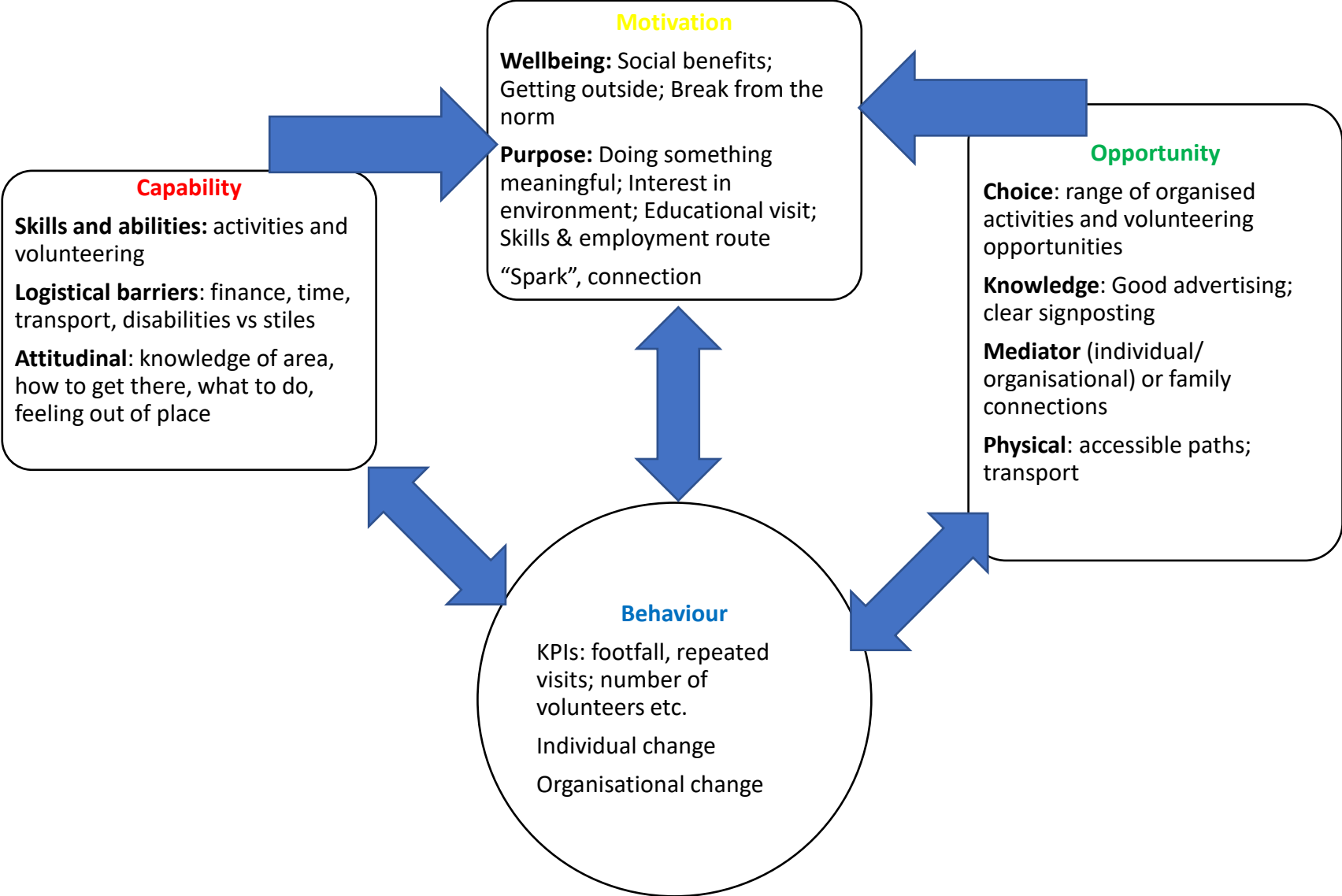
Motivation – ‘brain processes’ that energise and direct behaviour – including habitual processes (habits), emotional response and conscious decision making.

Behaviour – there is considerable overlap between behaviours and outcomes. Some measurable outcomes are also behaviours, such as visiting, volunteering, taking part in activities, mediating, pro-environmental behaviour, while some outcomes are about the effects of interventions or behaviours on individuals (e.g. changes in wellbeing), organisations (e.g. sustainability) and the National Park (e.g. reduced litter) (see next section for more detail on effects).

The arrows in figure 1 represent potential influence between components in the COM-B system – for example, opportunity or capability can influence motivation, while enacting a behaviour can alter capability, motivation and opportunity.

¹ https://social-change.co.uk/files/02.09.19_COM-B_and_changing_behaviour_.pdf

Figure 1: COM-B model



7. Behaviour – five ways to wellbeing. Behaviour can be thought of as mechanisms or pathways to producing change, as well as outcomes in themselves. As many of the changes at individual level relate to wellbeing, the evidence-based five ways to wellbeing model² may be a good fit here:

Connect: Connections made with others through organised activities and volunteering; life-course connections; connections made with organisations and with the National Park; connections felt with nature.

Be active: Physical activity such as walking, caving, repairing footpaths or tree planting.

Take notice: Being in nature can have positive effects on mental health through mindfulness-related effects, a sense of wonder and awe; relaxation, getting away from everyday responsibilities, 'a break from the norm'.

Keep learning: Having a range of activities to choose from was felt to be important, in igniting a spark of interest. For some people, citizen science and learning about nature and the National Park was important; for some it was about learning new skills; for others about getting to know a new place.

Give: By volunteering or taking part in organised activities, or engaging in pro-environmental behaviours or responsible tourism.

8. Outcomes: individual

Knowledge, attitudes, intentions:

- Improved knowledge about the YDNP – how to get there, how to get around, what to do
- Increased understanding of nature (e.g. where food comes from) and how to look after it, responsible tourism, knowledge of history of the park and wildlife.
- Learning (for children)
- Spark of interest – could lead to further learning and skills development, raised aspirations, employment; independent action
- Enjoyment
- Intentions to engage; wanting to return
- Sense of ownership and connection
- Range of activities develops knowledge and skills – leads to increased confidence and self esteem

Behaviours: Visiting more; volunteering (there is a clear link between volunteering and wellbeing); pro-environmental behaviour and responsible tourism; taking part in activities; bringing others to the National Park.

Wellbeing

- *Social wellbeing:* increased social connections/reduced social isolation (and loneliness); connection with other groups (bridging social capital)
- *Mental wellbeing:* emotional response - sense of connection with nature, sense of purpose, sense of belonging lead to improved individual wellbeing [differentiate

² <https://neweconomics.org/2008/10/five-ways-to-wellbeing>

between those who visit in organised groups and those who visit independently; use pre and post measures] and mental health³; “Break from the norm”/relaxation; feeling valued; increased confidence and self esteem

- Spiritual wellbeing/connection: Spark of interest – could lead to further learning and skills development; connection to nature
- *Physical wellbeing*: physical activity (walking, activities) leads to better health if maintained (also risks!); positive physiological response to being in nature (well documented); fresh air, better sleep (also impacts on mental wellbeing); getting fitter

9. Outcomes: organisational

Building relationships: increased involvement with YDNPA via staff mediations; increased involvement for service users.

Achieving organisational objectives e.g. to support mental health/disabled access to nature/conservation

Stress?: a lot of work for mediators

Skills development for staff and service users

10. Outcomes: YDNP/A

- **KPIs** of increased footfall and volunteering numbers (short/medium term)
- **KPI** of increased diversity (short/medium term)
- **KPIs** of repeat visits (medium/long term)
- Increased knowledge and understanding of the needs of different groups, so they are better served and more able to visit
- Engagement in activities leads to improvements in footpaths, planting, repairs to walls etc. (short/medium term)
- Volunteering also leads to increased capacity (short term), and sustainability (medium/long term), and more welcoming to visitors (short/medium term) – leads to increased visits and engagement (medium/long term)
- Pro-environmental behaviour and responsible tourism leads to improved conservation and decreased litter/erosion/harm to wildlife/conflict with local residents (medium/long term)
- Lifelong/intergenerational stewardship (also environmental) (long term)
- Benefits to local economy?
- Sustainable funding streams?

11. Outcomes: environmental

- Increased knowledge/interest in other green spaces and National Parks (short/medium term)
- Increased knowledge/interest about environmental risks/climate change? (medium/long term)

³ Well documented in evidence base e.g.

<https://www.internationaljournalofwellbeing.org/index.php/ijow/article/view/449>

<https://www.tandfonline.com/doi/full/10.1080/14729679.2019.1660195>

<https://link.springer.com/article/10.1007/s10902-019-00118-6>

- Knowledge about pro-environmental behaviour leads to improved conservation of other areas, and wider environmental effects (e.g. increased recycling)
- Responsible tourism leads to decreased litter/ erosion/ damage to wildlife in other areas (medium/long term)

12. Underlying assumptions

- Some people will engage naturally with no input from the YDNP Authority or mediating organisations
- Some people come in childhood and come back with their own children
- Visits will be an enjoyable/positive experience for the majority of visitors

3: YDNP Authority Evaluation Framework

The evaluation questions are based on the original brief from the YDNP Authority, plus subsequent communications. They form the framework for data collection. Some are relatively straightforward to answer, others are more challenging. Data can either be collected by the Access & Engagement team or additional resource may be needed for some of the more challenging aspects.

Table 1: Evaluation Questions

Outcome		Process		
EQ1	Have the A&E team achieved their agreed annual objectives (B4, B5, B7)?			Short term
EQ2	Are a diverse range of ‘under-represented’ groups reached by the A&E team’s activities?			Short term
EQ3	Do participants achieve the shorter term aims outlined in the Theory of Change? Including engagement with the YDNP (knowledge, comfort, enjoyment), connection to nature, improved sleep and social connections.			Short term
		EQ4	How do participants view the experience of engaging with the YDNPA A&E programme of work?	Short term
EQ5	Does taking part in an A&E programme lead to people visiting the YDNP and other Green Space independently?	EQ6	How does the pathway from taking part in an A&E programme lead to independent visits to YDNP/GS? What are the key facilitators and barriers?	Medium term
EQ7	What is the evidence that taking part in an A&E programme leads to increased nature connection/(pro-environmental behaviours)?	EQ8	How does taking part in an A&E programme lead to increased connection to nature/(PEB)?	Medium term
EQ9	Do participants achieve the longer-term aims relating to improved health and wellbeing?	EQ10	Do the benefits from participating in an A&E programme ‘ripple out’ to family, friends, the wider community?	Long-term
		EQ11	What is the role of community/voluntary sector organisations in improving access and engagement amongst underserved groups? How can YDNPA A&E team support/encourage their involvement?	Short-medium term
		EQ12	Have the YDNPA A&E team increased their understanding of how best to engage with under-represented groups? Has this ‘rippled out’ to YDNP more generally?	Medium – long term

Outcomes, measures and methods


NB outcomes with an asterisk () were identified as priorities by YDNPA A&E team.*

The following tables detail what outcomes are expected (short, medium and long-term) for the various stakeholder groups. Potential measures are identified – using validated scales were possible plus Methods to collect the data. Outcomes are mapped to evaluation questions so if the A&E team decide to focus on particular ones, they can identify which outcomes to measure.

There is more detailed information on measurement scales in Appendix 1.

QN – quantitative, **QL** – qualitative.

Table 2: Individual participants engagement with YDNP: outcomes, measures and methods

	Expected Outcomes	Measures	Method (NB see later table where methods are described in more detail)
Short-term (0-3 months after visit)	<p>Under-represented groups are reached by the A&E team [EQ2]</p> <p>Programme participants gain knowledge* about the YDNP - how to access it, what there is to see and do, how to visit responsibly [EQ3]</p> <p>Programme participants feel welcome and comfortable in the YDNP (attitudes*). They enjoy* their experience. [EQ4]</p> <p>Programme participants want/intend* to return to the YDNP [EQ3&5]</p> 	<p>Demographics of visitors. Including ethnicity, age, gender, disability. Plus, postcode (deprivation indicator) and whether they have visited YDNP before. (QN)</p> <p>Have sufficient information to return (self-reported)/any gaps (QN & QL)</p> <p>Visit satisfaction (QN): Satisfied with visit? (out of 5) Felt welcome/comfortable? (Likert scale) Enjoyed the visit? (Likert scale) Intend to return (Y/N/maybe) Would recommend to others? (Y/N/maybe)</p> <p>Perceptions of visit – explored qualitatively</p>	<p>Visit monitoring form (A) Completed by programme participants before/at start of visit.</p> <p>Feedback form – individual (B) Completed by participants one week after visit – potentially distributed by VCSE organisation. Open and closed questions re perceptions of visit.</p> <p>Feedback form – group organiser (C) Completed by organiser (e.g. teacher/community lead) one week after visit. Open and closed questions re perceptions of visit – for themselves and the participants.</p>




<p style="text-align: center;">Medium-term (3 months to 1 year)</p>	<p>People advocate for the YDNP* [EQ9]</p> <p>People feel connected to the YDNP* [EQ3,5,6]</p> <p>Return visits* to the YDNP (independent or not?) [EQ5,6]</p> <p>People gain new skills* [EQ5,7] <i>Need to clarify what type of skills...</i></p> 	<p>Have you spoken to friends, family, wider community about YDNP? (Y/N/unsure) If Y, who? How many?</p> <p>Have you returned to YDNP? (Y/N/unsure) If Y, how many times? Independently or otherwise? (QN). Explore pathway (QL)/barriers/facilitators.</p> <p>Belonging. Adapt questions from Community Life Survey. 'How strongly do you feel you belong to your immediate neighbourhood?'/ 'YDNP'? (very/fairly/not very/not at all) Also explore qualitatively.</p> <p>Skills learnt from visiting (QL)</p>	<p>Follow-up interview – individual participants (D) Six months after visit. Via telephone if possible. Select a sample, by programme/demographics. Assess behaviour (visits)/attitudes since visit.</p> <p>Follow-up interview – community groups/organiser (E) Six months after visit. Via telephone. Ask about impact on community.</p>
<p style="text-align: center;">Longer-term (1-3 years)</p>	<p>People volunteer* for the YDNPA [EQ7]</p> <p>Feel ownership*/sense of belonging to the YDNP [EQ5,6]</p> <p>Wider people in their Community become aware of the YDNP [EQ10]</p>	<p>Number of volunteers from under-represented groups (QN)</p> <p>Number of visitors from under-represented groups visiting/engaging with the YDNP (QN)</p> <p>Sense of belonging (QN)</p> <p>Members of under-represented groups on advisory boards (QN)</p> <p><i>Social media metrics (numbers of under-rep groups liking posts/ interacting with website) Need to find out what is possible.</i></p>	<p>Volunteer monitoring data (assume existing) (F) Number of volunteers/advisory groups members from under-represented groups/by postcode. How they got involved with YDNPA.</p> <p>Visitor numbers to YDNP (G). Tie-in to existing data collection (assume done). Number from under-represented groups/by postcode. How they heard about YDNP.</p> <p>Optional extras: Longitudinal Study (H) To explore inter-generational relationships with YDNP. Potential methods would need discussing as the long time-frames make this challenging.</p> <p>Peer Research (I). Recruit from key communities to assess awareness of YDNP, visits including barriers/facilitators to use.</p> <p>Case studies (J) Community groups use YDNPA template to collect case studies of individuals who participated in programmes</p>

Table 3: Individual participants' connection with nature: outcomes, measures and methods

	Expected Outcomes	Measures	Methods
Short-term (0-3 months after visit)	<p>Emotional response (spark)* when visiting [EQ3,4,7,8]</p> <p>Improved environmental knowledge (learning)* [EQ3,7,8]</p> <p>Feel closer to nature (NC) [EQ3,7,8]</p> 	<p>'Spark'</p> <p>Possible QN measure: 'Sublime Emotion toward Nature' scale. But overlap with NC scale so suggest not including.</p> <p>Learning – 1 to 10 scale. Plus, open question 'key leanings from visit'</p> <p>'Inclusion of Nature with Self' (INS) scale (2 overlapping circles 'me' and 'nature') – illustrated version available (suitable for non-English speakers/people with learning difficulties etc) (QN)</p>	<p>Monitoring Data (A)</p> <ul style="list-style-type: none"> INS (Pre) <p>Individual Feedback Forms (B) – one week after visit</p> <p>Open questions re</p> <ul style="list-style-type: none"> Emotion/'spark' when visiting Key things they learnt about the environment. <p>QN Measures:</p> <ul style="list-style-type: none"> Learning (scale) INS (post) <p>Optional extra:</p> <p>Creative methods workshop (K) with programme participations shortly after the visit. To draw/visualise emotions during visit to YDNP.</p>
Medium-term (3 months to 1 year)	<p>Spend more time in nature* [EQ5,6]</p> <p>Pro-environmental behaviour* increases [EQ7]</p> <p>Feel closer to nature [EQ7]</p> 	<p>How much (recreational) time have spent in nature/green spaces, in last week (QN)? <i>See if reached threshold of 120 minutes (White, 2019)</i></p> <p>Number of visits to YDNP since initial organised trip (QN), how that occurred.</p> <p>Any environmental activities (broad definition) completed since</p> <p><i>NB Suggest NOT measuring PEB directly as strong link between increased NC (which we are measuring) and PEB</i></p>	<p>Follow up interview (D) – assess whether, since their initial visit, they have:</p> <ul style="list-style-type: none"> spent more time (120 minutes per week) in Green Spaces e.g. walking/looking at the view engaged with GS in other ways e.g. gardening performed any environmental actions e.g. litter picking/recycling Visited YDNP again or not. <p>Process questions – probe how that happened</p>

<p>Longer-term (1-3 years)</p>	<p>People advocate for the natural world</p>	<p>Green/environmental activities undertaken by individuals in own neighbourhoods</p> <p>Nature type activities within visiting Community Groups</p>	<p>Case studies – individuals (J) Community groups use YDNPA template to provide case studies of individuals who participated in programmes</p> <p>Case studies – organisations (L). Narrative account of how community groups/organisations have changed what they do as a result of engaging with YDNPA.</p>
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Table 4: Individual participants' health and wellbeing: outcomes, measures and methods



	Expected Outcomes	Measures	Methods
Short-term (0-3 months after visit)	<p>Improved sleep* [EQ3]</p> <p>Improved social connections [EQ3]</p> 	<p>How well did you sleep after your visit? (better /same/worse than usual)</p> <p>Social connections - QL questions</p>	<p>Feedback form – individual (B)</p> <p>Question re sleep</p> <p>Did you make any new friends/connections?</p> <p>Additional method -optional questionnaire. For more intense/longer term programmes.</p> <p>Pre, Post, Follow-up</p>
Medium-term (3 months to 1 year)	<p>More active*, in nature [EQ9]</p> <p>Improved self-confidence [EQ9]</p> <p>Reduced loneliness [EQ9]</p> <p>Sense of meaning/purpose [EQ7,9]</p> 	<p>Since visit have you been more physically active outside? (Y/N/U) In what ways?</p> <p>Confidence in using GS independently – scale (very/somewhat/not very)</p> <p>Loneliness scale – 1 question option in appendix.</p>	<p>Follow up interviews - individuals (D)</p> <p>Questions re benefits from participating including social connections, being active in nature, confidence.</p>
Longer-term (1-3 years)	<p>Improved health and wellbeing* [EQ9]</p>	<p>Wellbeing:</p> <p>Either 7 item SWEMWBS, or 4 ONS Personal Wellbeing questions or 1 ONS question re life satisfaction</p> <p>Health (self-rated):</p> <p>How would you say your health is today/ these days? (excellent/ good/ fair/ poor).</p> <p>Social capital questions – see appendix. From Community Life Survey.</p>	<p>Case studies – individuals (J)</p> <p>Community groups use YDNP template to provide case studies of individuals who participated in programmes. Would include a box re health/wellbeing benefits.</p> <p>Additional method – optional questionnaire.</p>

Table 5: YDNPA: outcomes, measures and methods



	Expected Outcomes	Measures	Methods
Short-term (0-6 months)	<p>Information/communication* about the YDNP is appropriate/accessible for underserved groups [EQ2]</p> <p>Range of activities provided by YDNP Authority (or partners) that are suitable for underserved groups [EQ2]</p> <p>Meet KPIs re diversity/footfall/volunteering etc [EQ1]</p> 	<p>Satisfaction with information provided, amongst underserved groups</p> <p>Feedback forms acted upon/responded to</p> <p>Data on visitors and volunteers</p>	<p>Individual Feedback Form (D)</p> <p>Organisational Feedback Form (E)</p> <p>Visit Monitoring Form (A)</p> <p>Volunteer Monitoring Data (F)</p>
Medium-term (6- 18 months)	<p>Better understanding of underserved groups – their needs and barriers (amongst YDNP authority) [EQ11]</p> <p>Improvements in infrastructure (from volunteering activities)</p> 	<p>Proxy measures</p> <ul style="list-style-type: none"> • Are people from underserved groups on boards/advisory groups? • Delivery of awareness raising sessions/information (or similar) by A&E team to authority • Communication of research findings to wider authority <p>Visits by/meetings to community groups or other organisations representing underserved groups</p>	<p>Volunteer Monitoring Data (F) (<i>if captures advisory groups</i>)</p> <p>Audit of A&E team’s engagement work (M)</p>
Longer-term (18m -3 years)	<p>Better provision in the YDNP for underserved groups- [EQ2, 12]</p> <p>Improved stewardship of YDNP* from more responsible visiting/contribution from visitors [EQ5,7]</p>	<p>Visits from underserved groups increase (proportion of total)</p> <p>Miles of ‘accessible’ paths (for wheelchairs)</p> <p>Responses to suggestions made in feedback forms/via interviews</p> <p>Number of complaints made re visitors (proxy measure for responsible visiting)</p>	<p>Visitor Numbers (G)</p> <p>Accessible path miles</p> <p>Audit of A&E team’s engagement work (M)</p> <p>Volunteer Monitoring Data (F)</p>

Table 6: Organisations (community/voluntary groups) engaging with underserved groups: outcomes, measures and methods



	Expected outcomes	Measures	Methods
Short-term (0-6m)	Community groups become aware of YDNP as a venue to visit and gain the skills/connections to bring groups [EQ11] 	Qualitative responses Intend to return (Y/N/Maybe)	Organisational Feedback Form (C)
Medium-term (6-18m)	Community groups signpost people in their neighbourhood to visit YDNP [EQ11] 	Qualitative feedback/examples	Follow up interviews with community groups (E)
Longer-term (18m -3 years)	Embedded engagement /relationship between CGs and the YDNPA [EQ11]	Number of nature/environmental based activities run by community/voluntary group Number of visits to/joint activities with YDNP/A	Case studies with Community Groups/organisations (L) Audit of A&E team's engagement work (M)

Table 7: List of Methods

A	Visit Monitoring Form (Important)	Distributed to participants of selected programmes, either before or at the start of their visit. Paper or electronic. Data captured: individual demographics, history of visits to YDNP, Inclusion of Nature in Self Scale (pre) Date of visit, organiser, name of individual (if possible)
B	Individual Feedback Form (Important)	Distributed to participants of selected programmes, one week after their visit (to allow time for reflection). If possible, via community group that organised the visit. Data captured: YDNP: Satisfaction with visit, knowledge re how to visit, intention to return, environmental knowledge, key learnings Nature: Inclusion of Nature in Self (post). Open questions re ‘spark’/emotion. H&WB: How well did you sleep after? did you make any new friends/connections? Plus date of visit, name of individual (so satisfaction/intention can be analysed by demographic group and pre-post measures compared) Consent/contact details for taking part in an interview 6 months later.
C	Organisational Feedback Form (Important)	Distributed to mediators of group visits, one week after their visit (to allow time for reflection). Data captured: Perception of the group’s visit/activity. How appropriate for group? How well organised? YDNP suitability as a place to visit. Potential improvements What skills/connections do they need to arrange future visits? Future intentions.
D	Individual follow-up interview (Important)	Telephone interview with a sample of participants of selected programmes, 6 months after visit (to assess medium term outcomes). Data captured: Re YDNP: Have they spoken to friends/family/wider community about YDNP? Return visits. Feeling of belonging (QN/QL). Pathway to independent visits (QL) – how did it happen? Barriers/facilitators. Re: GS/nature: Since visiting, have they spent more time in GS/engaged in other environmental activities (how/process questions). Re: H&WB questions – social connections made, activity in nature, confidence

E	Organisational follow-up interview (Important)	Telephone interview with all organisers of visits, 6 months after relationship started. Data to capture: their perception of the impact of visits on wider community, return visits (including barriers/facilitators), whether signposting people to YDNP Have they made any changes to what they deliver? More nature/environmental activities?
F	Volunteer Monitoring Data (existing?)	Monitor, over time, the number of volunteers (including advisory group members) from under-represented groups, plus from postcodes where programme has been delivered. If possible, add a standard question re how they got involved with volunteering at YDNPA. Looking to see an increase over time/examples of people becoming involved via A&E programmes.
G	Visitor numbers to YDNP (existing ?)	Tie-in to existing data collection (if done?) Number from under-represented groups (increase over time)/certain postcodes. If possible, add a standard question re how they heard about/first visited YDNP. Looking to see an increase over time/examples of people visiting because of A&E work
H	Longitudinal study (Optional)	To discuss – capture inter-generational aspect. CHPR to consider options.
I	Peer Research (Optional)	Recruit community members to explore relationship of wider community with YDNP. Including awareness of/visits to the National Park. Sense of belonging. Barriers/facilitators to visiting. Advantage of Peer Research is better reach into the community.
J	Case Studies – individuals (Important)	Template to capture stories of individuals who participated in A&E programmes. Distributed via community organisations from 6m after visits. Organisations select individuals who benefitted from engagement. To ask about visiting YDNP since/key outcomes/their relationship with nature/environmental activities/H&WB benefits experienced.
K	Creative Workshops (Optional)	Selected programme participants – soon after visit. To explore experience of visiting/C2N/awe.
L	Case Studies – community groups/organisations (Important)	Capturing stories of community groups/organisations (including schools) and how their involvement with YDNPA has potentially changed their mission/practices/activities. For all participating organisations. Collected annually, or as appropriate. Feedback on A&E team’s work/YDNP suitability for their community.
M	YDNPA A&E team – audit of work (Important)	System to collect examples of team’s engagement with a) underserved groups and b) wider authority re underserved groups. To capture meetings/notes/points of learning.

4: Annotated Bibliography

This section contains key relevant literature used to inform the evaluation plan. Where possible relevant systematic reviews are used.

Much of the available literature is focused on **Urban** Green Space – not National Parks/rural areas. Plus, measures that combine all types of exposure are often used – including how ‘green’ people’s living environments are. This is less relevant to the work of the YDNPA so, where possible, included studies measure time spent in green places/nature environments (direct exposure).

The papers are split into topics:

- Health related papers (i.e. the link between health in general and Green Space)
- Wellbeing focused papers (i.e. link between mental health/wellbeing and Green Space/Nature)
- Nature Connection papers (the link between mental health/wellbeing and nature connection)
- Pro-environmental behaviour (the link between nature connection and PEB)
- Volunteering/environmental enhancement

Health Focused Papers – links between health and green space

Green Space and Health Equity: A Systematic Review on the Potential of Green Space to Reduce Health Disparities

Authors: Alessandro Rigolon et al., from University of Utah (and other American Universities)

Published **2021**, in International Journal of Environmental Research and Public Health
<https://www.mdpi.com/1660-4601/18/5/2563>

Review to see whether the (physical) health benefits from Green Space (GS) are greater for disadvantaged groups, compared to more privileged groups. Found 90 papers, most in USA and Europe. Most looked at CVD, obesity or birth outcomes.

Found that lower **Socio-economic status** (SES) people experienced greater health benefits from GS, compared to affluent people. This was especially true in Europe, less so in the USA.

The same was **not** true for racial/ethnic groups – no difference in the health benefits between white populations and BME populations.

Public Green Space (e.g. Parks) have a stronger protective effect than green land cover. The type of health outcome does not matter i.e. results are similar.

Therefore GS can contribute to reducing inequality.

Health and the natural environment: a review of evidence, policy, practice and opportunities for the future

Authors: Rebecca Lovell and Michael Depledge, University of Exeter with Simon Maxwell, DEFRA

Published **2018**, most work done 2015-2016
<https://ore.exeter.ac.uk/repository/handle/10871/36923>

Report summarising the interconnections between the natural environment and good health – and how these can be harnessed for policy and practice. Includes evidence review, case studies and consultations. Used to inform Defra (25 year) policy.

Headline findings re **outcomes**:

- “relatively strong evidence for mental health and wellbeing benefits arising from exposure to natural environments, including reductions in stress, fatigue, anxiety and depression, together with evidence that these benefits may be most significant for marginalised groups” (p30). Evidence for children is less well developed.
- Inequality in wellbeing, is narrower amongst those who report good access to green/recreational areas (p31)
- Many studies found “positive associations between natural environments and self-rated physical and mental health status” p31
- Other outcomes – e.g. mortality/obesity – more related to living in greener environments
- Positive ‘links/ mechanisms’ are increased physical activity and better social contact/community cohesion

Headline findings re- **interventions**:

- ***‘Encouragement of access, engagement and use of the natural environment’ – many studies, some variations in outcomes***
Green prescription programmes – shown to increase activity rates and improve self-reported self-esteem and mood states (four papers)
Meta-analysis of outdoor walking groups – found range of impacts on health
- ***‘Targeted health interventions using/based in natural environment’ – many studies, variations in outcomes***
Lots of small-scale project evaluations, rarely peer-reviewed/synthesised. One example, Ecominds (Mind) found range of positive outcomes including increased mental wellbeing.

Headline findings re inequality:

- Evidence shows that greener living environments associated with reduced inequality – thought to mediate health effects of long-term deprivation. One study found restorative impact of walking in a natural environment most beneficial for those with poor health.

Limitations:

- Can’t assume benefits apply to all population groups – some groups benefit more than others - need to understand this, or inequalities could be inadvertently increased
- Lack of evidence on acceptability of interventions by social group

Other interesting ‘snippets’:

- Figure 2, p28, shows potential pathways between natural environment and health outcomes
- Exploration of how values differ between social groups – some studies found less engagement amongst British Asian youths, young people in Scotland

The health benefits of the great outdoors: A systematic review and meta-analysis of greenspace exposure and health outcomes

Authors: Caoimhe Twohig-Bennett and Andy Jones from University of East Anglia

Published **2018**, in the Journal 'Environmental Research'

<https://doi.org/10.1016/j.envres.2018.06.030> Open Access

Review and meta-analysis (where results from studies are combined and re-analysed) focusing on physical health outcomes. 143 studies were included, with over 100 types of health outcomes. Mostly from Europe. Exposure to greenspace was measured in lots of ways (11) – most commonly neighbourhood greenspace, followed by greenspace interventions and proximity to green space. 27 looked at the impact of forest bathing.

Concludes that exposure to green space is associated with wide-ranging health benefits. These include reduced incidence of stroke, hypertension, asthma, coronary heart disease, Type 2 diabetes, cardiovascular mortality and better pregnancy outcomes. It is associated with improved cortisol levels (a marker of stress), blood pressure and cholesterol.

Because most studies did not report socio-economic status this review/meta-analysis could not see how outcomes varied between lower or higher socio-economic groups.

The authors conclude that there needs to be more research into how patients can be encouraged to improve their exposure to greenspace – especially those from low-SES areas.

Urban Green Spaces and health. A review of evidence.

World Health Organisation, **2016**.

Evidence review on links between health (all types) and green space. Focus is on **Urban** Green Space. Report summarises:

- **Pathways** between UGS and health. Including relaxation/restoration, improved social capital, immune system functioning, physical activity/fitness/obesity, noise buffering, reduced pollution/heat islands, pro-environmental behaviour, improved sunlight/sleep.
- Evidence of health **benefits**. Including:
 - Improved mental health/cognitive functioning (stronger evidence for mental health—especially for surrounding greenness)
 - Reduced cardio-vascular morbidity (associations found)
 - Reduced prevalence type 2 diabetes (plausible association)
 - Reduced mortality
- Possible pathogenic (**negative**) effects of green space. Including exposure to air pollutants, risk of allergies/asthma, exposure to pesticides/herbicides, disease vectors, injury, UV and crime.
- How health benefits vary by **specific groups**.
 - Women—responses to nature (stress markers) vary by gender. Issues of safety for women.
 - Children & adolescents. Development of motor skills/cognitive/emotional, social development.
 - Older adults – including reduction in sedentary behaviour, improved sleep and social connections.

- **Deprived populations/minority groups.** Accumulating evidence that “health benefits linked with access to GS may be strongest among the lowest Socio-economic groups, including minority ethnic groups” (p18)

For people with mobility impairments

Health promoting nature access for people with mobility impairments: A systematic Review

Authors: Zhang et al, from University of Copenhagen

Published **2017**, International Journal of Environmental Research and Public Health

Review looking at nature interventions/activities for people with mobility impairments – including what type of people participated, health outcomes seen and any accessibility issues.

Found 27 articles. Covered a range of nature related activities categorised into; passive involvement, active interactions and rehabilitative activities. Health benefits were split into physical, mental and social. Mental health benefits most significant – some benefits are unique – improvement of self-confidence, self-esteem and realization of capacity leading to a more positive self-identity. Authors deduce that some of the benefits last into the longer-term.

Barriers fall into three categories. Structural constraints, plus intrapersonal (own expectations) and interpersonal (interactions with others). Need to balance wild features of nature with accessibility and challenge expectations/awareness.

Wellbeing focused papers (i.e. evidence linking GS and wellbeing)

Spending at least 120 minutes a week in nature is associated with good health and wellbeing

Authors: Matthew White and colleagues. from University of Exeter, plus others

Published: **2019**, Journal – Nature, Scientific Reports, <https://www.nature.com/articles/s41598-019-44097-3>

NOT a review but included as it focuses on ‘direct exposure’ to nature (visits to natural environments) as opposed to neighbourhood greenspace or proximity. Authors trying to establish a ‘dose response’ i.e. how much nature is needed for benefits – and whether visits to nature can balance out living in a nature deprived area.

Study is cross-sectional, using data collected by the Monitor of Engagement with the Natural Environment Survey, a large representative UK survey from nearly 20,000 people.

The study compared how much time people had spent in nature (for recreation, not work) in the last 7 days (in hour blocks) with their **self-reported health** and **subjective wellbeing**.

People who spent 2 hours a week in nature were significantly more likely to have higher self-reported health and wellbeing (after controlling for various factors). More than 120 minutes did not seem to provide any additional benefit, implying that this is a sort of ‘threshold’. It didn’t matter how that time was split i.e. lots of short visits or one long visit. Results were consistent across age, gender, SES, disability status, neighbourhood deprivation and neighbourhood greenspace.

Results by ethnicity were mixed – measures of wellbeing found significant results for both white British and ‘other’ but the measure of health found significant results for white British but NOT ‘other’. Authors uncertain why.

How big was the effect? Authors say it is ‘meaningful’ - as big as the difference between living in an area of high vs low deprivation, being employed in a high vs low social grade occupation and between achieving recommended levels of physical activity in a week, or not.

Study is cross-sectional so doesn’t prove that nature leads to better health/wellbeing. Authors tried to control for physical activity levels (as this could be confounding the results) but found it difficult to untangle.

A scoping review mapping research on green space and associated mental health benefits

Authors: Charlotte Wendelboe-Nelson and others from Herriot Watt University, Edinburgh

Published: **2019**, in International Journal of Environmental Research and Public Health

<https://www.mdpi.com/1660-4601/16/12/2081>

Maps the literature on different types of green space and their association with mental wellbeing (adults only). How do different types of GS affect MWB? Do different factors affect MWB outcomes? Do different groups benefit differently?

Found 263 papers. Most qualitative. Most in USA or Europe.

Split into Green Space types; Urban GS (140 studies), wild or natural GS (34 studies), horticulture/gardens/allotments (43 studies), virtual or indoor GS (24).

Outcomes. Lists all the different measures/scales used. Wide variety – most commonly they developed their own. Other common tools include Perceived Restoration Scale, Positive and Negative Affect Schedule, Perceived Stress Scale, GHQ, WEMWBS etc.

Lists 10 most used health endpoint (p16) and scales used to measure them.

Concludes by agreeing that there is a positive association between Green Space and MWB. Different types of GS in many contexts and different environments have a positive effect on MWB. Variety of different groups experience these effects. The type of GS affects people in different ways.

However, as there is a great diversity in design, definitions, outcome measures it is difficult to aggregate the evidence to identify mechanisms.

The relationship between greenspace and the mental wellbeing of adults: A systematic review

Authors: Victoria Houlden et al. from University of Warwick and University of Sheffield

Published: **2018**, in PLOS ONE journal <https://doi.org/10.1371/journal.pone.0203000>

Review focusing on the link between greenspace and mental wellbeing in adults. 52 studies looked at either hedonic (happiness/life satisfaction) or eudemonic (fulfilment/purpose) wellbeing.

Studies were split into 6 categories – depending on how greenspace was measured. They then assessed the quality of the evidence for each. Noted that Randomised Control Trials (gold standard) were rare.

- I. The amount of local greenspace. 21 studies. Concluded there IS adequate evidence for the association between local green-space and life satisfaction but not for some other wellbeing measures. Also, a positive link with General Health Questionnaire results.
- II. Greenspace type. 10 studies. Concluded limited evidence for link to MWB because of diversity of measures used.
- III. **Visits to greenspace.** 17 studies. Concluded that frequency of visits to greenspace may be associated with aspects of mental wellbeing but limited evidence strength.
- IV. Views of greenspace. 3 studies. Assessed as inadequate level of evidence.
- V. Greenspace accessibility. 8 studies – inconsistent findings.
- VI. Subjective **Connection to Nature**, 7 studies. Consistent findings but studies often poor quality – conclude that “personal connection to nature may be associated with MWB but the strength of evidence is limited”.

Mental Health/Wellbeing in Children/Adolescents

Impact of Green Space Exposure on Children’s and Adolescents’ Mental Health: A Systematic Review

Authors: Gert-Jan Vanaken and Marina Danckaerts (Belgium)

Published: **2018**, International Journal of Environmental Research and Public Health

<https://www.mdpi.com/1660-4601/15/12/2668>

Systematic review of the evidence re the association between green space exposure with mental health problems, mental wellbeing and developmental problems in children, adolescents and young adults (up to 25 years old).

21 studies included, most in Europe or USA. All observational studies using standardized measures. Divided studies into those that looked at 1) emotional/behavioural difficulties 2) mental wellbeing (MWB) 3) neurocognitive development. Exposure to GS was measured either by maps, remote sensing or (rarely) questionnaires asking participants re time spent in GS.

Emotional/Behavioural Difficulties – credible evidence for an (inverse i.e. beneficial) association between GS exposure and emotional and behavioural problems – particularly hyperactivity/inattention problems. Independent of demographic/SES. Partially mediated by physical activity, buffering of air pollution and social interaction.

Limited evidence for beneficial association MWB in children and depressive symptoms in adolescents/young adults.

NB One study measured GS exposure by teenagers wearing GPS watches. Spending time in GS was related to higher physical activity and better mental health. PA partly mediated the relationship (i.e. the PA played a role in the benefits).

Children vs adolescents. Former more affected by access to a garden/local GS. Latter more related to neighbourhood greenness/quality of GS.

Mental health benefits of interactions with nature in children and teenagers: a systematic review

Authors: Suzanne Tillman et al, based in Canada

Published **2018**, Journal Epidemiol Community Health,
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6161651/pdf/jech-2018-210436.pdf>

Review on how accessibility to, exposure to and engagement with nature affects the mental health of children and teenagers. Includes quantitative studies of 0-18 year olds.

35 papers, most USA or UK. Categorised into what type of Mental Health was being investigated; emotional wellbeing (15 papers), ADD/ADHD (10), mental health (9), self-esteem (9), stress (4), resilience (3), depression (3), health related quality of life (2). Lists all measurement tools.

And how GS was measured – ‘accessibility’ (ease of reaching), ‘exposure’ (contact with/presented to e.g. time in GS), ‘engagement’ (involvement/participating in an activity).

Results

Over half papers found statistically significant positive relationships. Other half – not significant. One shows negative effect.

Mostly significant positive relationships found in relation to ADD/ADHD, overall mental health, stress, resilience and health related quality of life. Inconclusive evidence for emotional well-being, self-esteem, depression.

When looking at how GS exposure was measured – most of the positive studies related to ‘exposure’. Less of a strong relationship with accessibility. Engagement studies – again, less significant results. Could be because many of the studies are with ‘at risk’ groups – need more studies examining engagement with GS amongst ‘healthy’ children and adolescents.

Wellbeing improvements in people with Long Term Conditions

Nature-Based Interventions for Psychological Wellbeing in Long-Term Conditions: A Systematic Review

Authors: Eleanor Taylor et al, from University of Leicester

Published: **2022**, International Journal of Environmental Research and Public Health
<https://www.mdpi.com/1660-4601/19/6/3214>

Systematic review of evidence re whether Nature-Based Interventions benefit the mental health of people living with LTCs. NBIs had to be ‘active’ i.e. taking part in a programme run outdoors. Excluded cancers as warrant a separate review.

Included 13 studies, most quantitative, 10 from Asia (none from UK!).

Studies included people with COPD, stroke, CVD (high blood pressure, hypertension, heart failure, post heart surgery). NBIs included forest-based interventions, horse-riding, horticulture. Range of psychological measures included – most commonly Profile of Mood States (POMS). Most also measured physiological outcomes.

All studies reported a significant positive impact of NBIs on a range of psychological wellbeing and physiological outcome measures. Those that used POMS found improvements in negative measures (decreased tension/anxiety, depression, anger/hostility, fatigue, confusion) and positive measures (vigour). Other studies found improvement in functional capacity, mental health, measures of 'relaxed' and 'natural'. Benefits greater than exercise alone.

Notes that different interventions are likely to work on different aspects of MWB and in different ways – not enough studies to establish this yet. “our findings cannot address what works best for whom and in what context”. Impact of forest bathing, for example, very different to horticulture or horse-riding. Likely that social aspects are “as important as the nature benefits”.

Nature Connection Papers – evidence of link between C2N and wellbeing

The Relationship between Nature Connectedness and Eudaimonic Well-Being: A Meta-analysis

Authors: Alison Pritchard and others (from University of Derby)

Published: **2020**, Journal of Happiness Studies <https://doi.org/10.1007/s10902-019-00118-6>

Set out to explore relationship between nature connection and two different aspects of wellbeing - Eudaimonic wellbeing (EWB) - relating to purpose/fulfilment/personal growth - and Hedonic Wellbeing (HWB) - feelings of happiness/satisfaction. Did 2 meta-analyses - how NC relates to EWB and how it relates to HWB – then compared.

Found 25 studies – mostly from Canada, Europe, USA. All but one with adults. Used a variety of NC scales – most commonly Connectedness to nature scale (CNS), Inclusion of nature in self (INS), Nature-relatedness scale –NR21 (long) and NR6 (short) plus others.

The meta-analyses found small positive correlation between NC and EWB “indicating that individuals who are connected to nature are more likely to be flourishing and functioning well psychologically.” Similar findings (but slightly smaller effect size) for HWB.

Within the EWB measures – ‘personal growth’ had the strongest relationship with NC. Authors say nature may have an important role in furthering psychological growth and development, providing ‘elevating experiences’ – where a person feels awe, elevation, connection, expanding a person’s sense of self/frames of reference (p17).

Need more research into which qualities of nature affect WB. Suggests that familiar nature more likely to lead to calm/contentment (restorative) whilst unfamiliar/‘bigger’ nature more likely to induce awe thus stimulating new ideas. Patterns of nature exposure needs more research too – short-term restorative effect vs. longer term effect from visiting more often, as NC grows.

Moments, not minutes: The nature-wellbeing relationship

Authors: Miles Richardson (University of Derby) and others

Published: **2021**, International Journal of wellbeing <https://doi.org/10.5502/ijw.v11i1.1267>

This is NOT a review but included as feels relevant. Authors looked at how five nature related factors each related to Wellbeing (Hedonic and Eudaimonic), illbeing and general physical health.

The five nature related factors were;

- Nature Connection (measured by INS – Inclusion of Nature in self),
- Time in Nature (days in last week spent more than one hour in nature),
- Engagement with nature (7 different activities listed e.g. smelling wildflowers)
- Indirect Engagement with Nature (e.g. watching nature programme on TV),
- Knowledge and Study of Nature.

Method - survey, commissioned by National Trust, run by YouGov of UK adults. C2000 participants.

They found that all five nature related factors were significantly related to wellbeing (both aspects). Then looked at which had the biggest impact. Found that 'Connectedness to Nature' and 'engaging with nature through simple activities' were most closely linked to higher wellbeing and lower illbeing, compared to any other nature-related factors, including time in nature.

For physical health – time in nature and nature connectedness were the biggest predictor of physical health.

Nature and mental health: An ecosystem service perspective

Authors: Gregory Bratman (from University of Washington) and many more

Published: 2019, Science Advances, Review

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6656547/pdf/aax0903.pdf>

This is a paper on how best to utilise nature experience opportunities to improve mental health. Authors summarise available evidence on link between MH and Nature, giving 'points of consensus' i.e. where sufficient evidence exists. They then propose a model that can be used to help anticipate the impact of decisions about nature provision/influence policy.

Points of consensus are:

- I. Evidence supports an association between common types of nature experience and increased psychological well-being. (Gives examples of studies)
- II. Evidence supports an association between common types of nature experience and a reduction of risk factors and burden of some types of mental illness. (Gives examples)
- III. Evidence suggests that opportunities for some types of nature experience are decreasing in quantity and quality for many people around the globe

Authors propose a model that harnesses existing knowledge to incorporate into ecosystem planning to support mental health. Traces a pathway from environment to mental health.

Step 1 – Natural Features (size, type, qualities)

Step 2 – Exposure (proximity to nature, time spent in contact with nature)

Step 3 – Experience (interaction/dose). NB Often missed out of planning

Step 4 – Effects (mental health/psychological wellbeing). Occur via multiple mechanisms, including stress reduction, social cohesion, physical activity, replenishment etc.

Aim is for the model to be used by planners, parks departments, health professionals etc. to plan interventions relating to the environment.

Pro-Environmental Behaviour

Do people who feel connected to nature do more to protect it? A meta-analysis.

Authors: Caroline Mackay and Michael Schmitt (Canada)

Published: **2019**, Journal of Environmental Psychology

Examined whether there is evidence that a sense of 'Connection to Nature' promotes Pro-Environmental Behaviour. Searched for studies that had explored this question and then re-analysed all the data together. Looked for two types of studies:

- Correlational (i.e. associations between the two concepts) – found 75 studies in total, with 27,000 participants
- Experimental (i.e. where NC is manipulated and PEB then measured) – found 17 studies, with 2000 participants

NB Studies that used a wide variety of measures for NC and PEB (public and private sphere) were included.

Concludes that there is “exceptionally good evidence for a strong association” between the two concepts (using correlational studies). This was across regions, ages, gender and ethnicity. Which measures of NC/PEB tended not to make a difference.

Experimental studies also showed a significant, positive effect – however less strong than correlational studies. Maybe because the experiments tended to be quite short-lived e.g. showing participants a film and this may not be a strong enough intervention.

Concludes that “more successful interventions would encourage participants to not only spend time in nature but also to reflect on the ways in which they feel like a part of and interdependent with nature.”

Volunteering/Environmental Enhancement Activities

Understanding how environmental enhancement and conservation activities may benefit health and wellbeing: a systematic review

Authors: Rebecca Lovell and colleagues from University of Exeter

Published: **2015**, BMC Public Health

<https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-015-2214-3>

Systematic review to investigate H&WB impact of participating in environmental enhancement/conservation activities. Used peer reviewed and grey literature (contacting 200 organisations). Plus developed a conceptual model, with expert advisory groups.

Found 32 papers - 13 quantitative, 13 qualitative 3 mixed studies. Some programmes designed to improve H&WB, others to improve the environment e.g. habitat restoration. Most from the UK, most related to group activities, nearly all with adults. Most studies categorised as being 'poor' quality. Outcomes measured varied – physical activity, mental health, quality of life.

Quantitative Findings – some studies showed participation had a positive impact on H&WB/quality of life but tentative/often not statistically significant. Unable to do a meta-analysis due to variation in data.

Qualitative findings – most participants perceived their H&WB had improved. Themes included; improved fitness, calmer, less stressed, more positive outlook, state of tranquillity. Benefits come from time in quiet, natural environments, achievement, enjoyment and social contact.

Conceptual model (potential pathways) shows potential mechanisms, outcomes and moderators (Figure 1).

NB The evidence base has probably increased since this review was done

The health and wellbeing impacts of volunteering with The Wildlife Trusts

Authors: Miles Rogerson and colleagues from University of Essex

Published: **2017** (i.e. after the above review). Not peer-reviewed (currently).

https://www.wildlifetrusts.org/sites/default/files/2018-05/r3_the_health_and_wellbeing_impacts_of_volunteering_with_the_wildlife_trusts_-_university_of_essex_report_3_0.pdf

Evaluation of activities run by Wildlife Trusts – aimed to measure impact of participating in a Wildlife Trust project on H&WB of participants. Used pre and post questionnaires.

Key findings:

- Wellbeing increased (amongst participants) from lower than the national average to higher
- Improvements in wellbeing greater at the start – and for people who had low WB to start with
- Participation led to statistically significant increases in positivity, nature relatedness, social engagement, pro-environmental behaviour, physical activity, contact with green-spaces.
- QL feedback – participants experienced increased sense-of-purpose, self/social confidence, physical and mental health and wellbeing

Appendix 1: Measurement Scales

For Social Capital Questions/Feelings of Belonging

Community Life Survey – see Appendix A of CLS Technical Report

<https://www.gov.uk/government/statistics/community-life-survey-202021> Selected questions: Frequency of social contact, how often you see/ chat to your neighbours, do you have people to rely on, do you trust your neighbours, on a 4 item likert scale

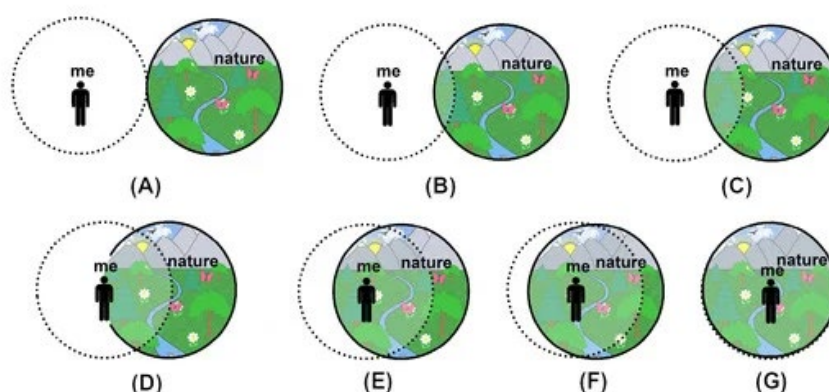
For 'spark'

Sublime Emotion Toward Nature Scale – see Table 2

<https://www.frontiersin.org/articles/10.3389/fpsyg.2019.00509/full>

For Connection to Nature

Illustrated Inclusion of Nature in Self Scale – see Appendix B <https://www.mdpi.com/2071-1050/13/4/1761/htm>



For wellbeing

Either the 7-item short Warwick- Edinburgh Mental Wellbeing Scale (SWEMWBS) which has been validated and used in a lot of research <https://measure.whatworkswellbeing.org/measures-bank/swemwbs/> or the 4 ONS Personal wellbeing questions which has been used to collect national data for years, so would make a good comparator. If fewer questions preferred ONS recommend just asking the life satisfaction question

<https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/methodologies/personalwellbeingssurveyuserguide>

Four measures of personal well-being

Next I would like to ask you four questions about your feelings on aspects of your life. There are no right or wrong answers. For each of these questions I'd like you to give an answer on a scale of 0 to 10, where 0 is "not at all" and 10 is "completely".

<i>Measure</i>	<i>Question</i>
Life Satisfaction	Overall, how satisfied are you with your life nowadays?
Worthwhile	Overall, to what extent do you feel that the things you do in your life are worthwhile?

Happiness	Overall, how happy did you feel yesterday?
Anxiety	On a scale where 0 is “not at all anxious” and 10 is “completely anxious”, overall, how anxious did you feel yesterday?

Source: Office for National Statistics

For loneliness

Either the 3 item UCLA scale, which is used by the ONS so makes a good comparator against national and regional data, or just the “how often do you feel lonely” question. ONS guidance is here: : <https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/methodologies/measuringlonelinessguidanceforuseofthenationalindicatorsonsurveys>

For Health

Valid practice to just ask one question re self-rated health: How would you say your health is today/ these days? (excellent/ good/ fair/ poor). See <https://jech.bmj.com/content/59/5/342>