The background features a decorative border of green foliage, including various leaves and branches. Several butterflies are scattered throughout: a purple one on the left, an orange one in the top right, and a blue one on the right. A blue bird is perched on a branch in the bottom left corner. The overall aesthetic is natural and vibrant.

# Assessing Connection to Nature

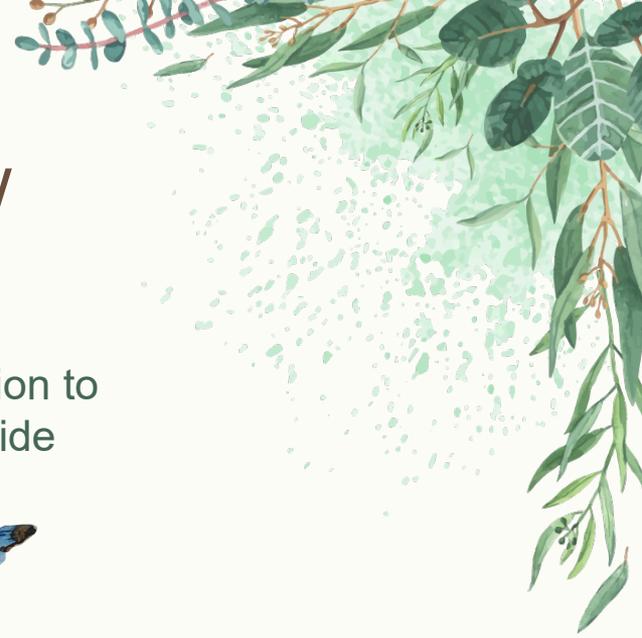
A Workshop for Practitioners

Chris Parsons, Word Craft  
Julie Ernst, University of MN Duluth



# Introductions

# Workshop Overview



## Part One

Overview  
of C2N



Assessing  
C2N



Introduction to  
the Guide



## Part Two

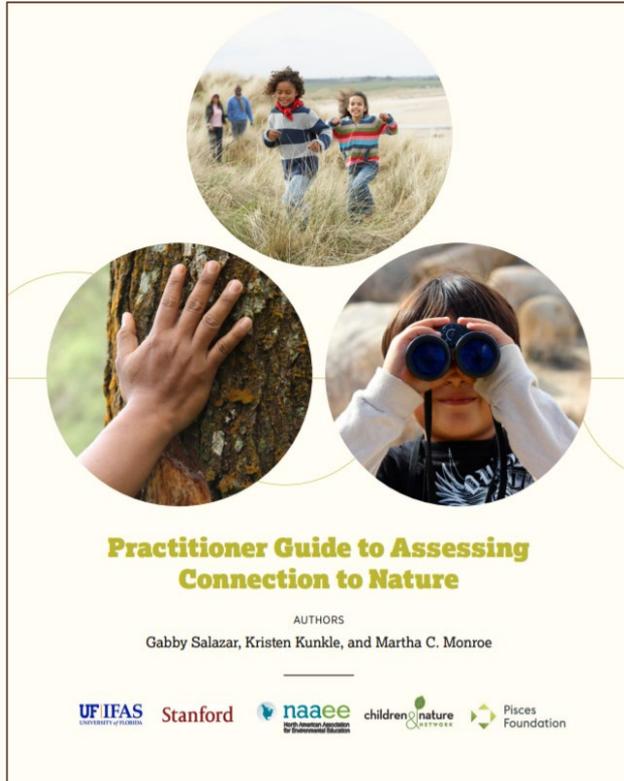
Applications



Questions



# Project Partners



**Practitioner Guide to Assessing Connection to Nature**

AUTHORS  
Gabby Salazar, Kristen Kunkle, and Martha C. Monroe

Logos for UF IFAS, Stanford, naaee, children & nature NETWORK, and Pisces Foundation.



children & nature NETWORK

naaee  
North American Association  
for Environmental Education



Pisces  
Foundation



UF | IFAS  
UNIVERSITY of FLORIDA



Stanford



# Project Leads

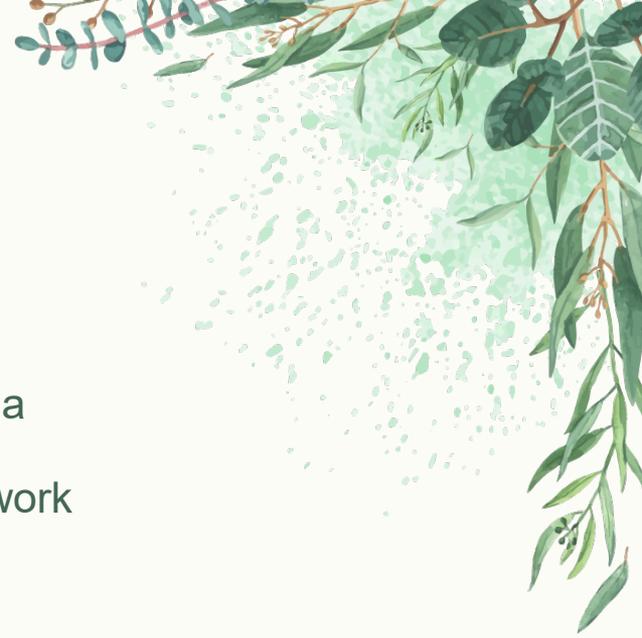
Martha Monroe – University of Florida

Cathy Jordan – Children & Nature Network

Nicole Ardoin – Stanford University

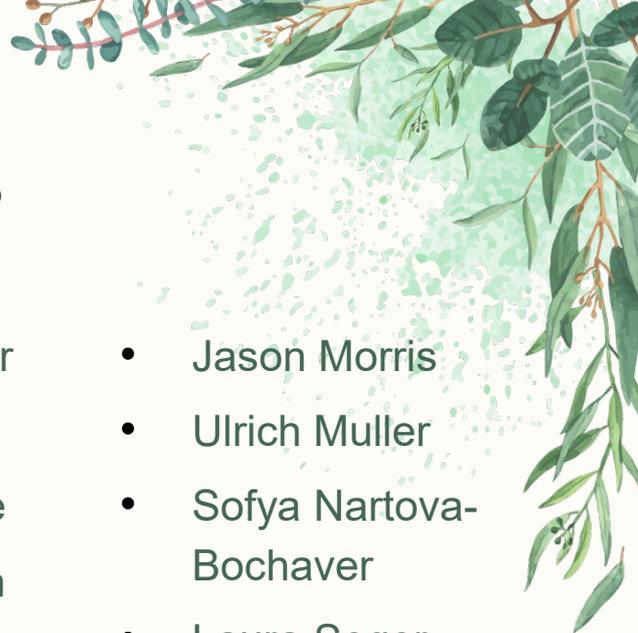
Judy Braus – NAAEE

Jason Morris – Pisces Foundation



# Project Contributors

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- Julie Torquati
- Archana Kannan
- Nik Sawe





# Connection to Nature

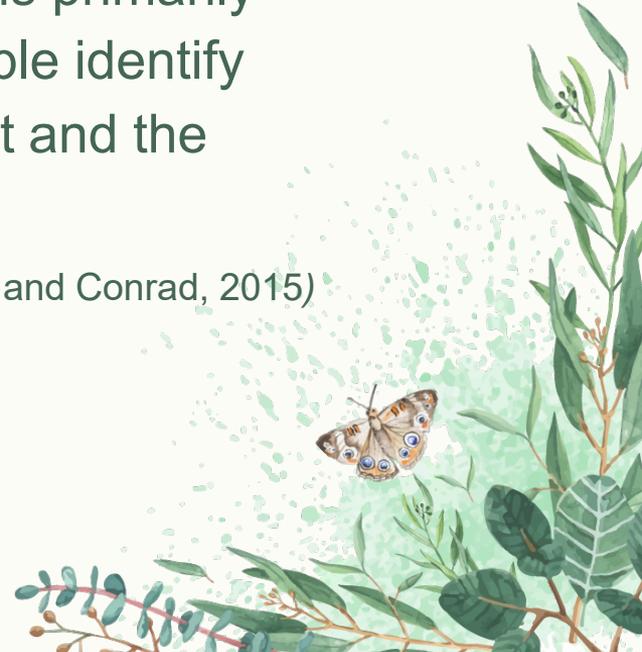
What it Is and Why it Matters



# Connection to Nature

“The study of connectedness to nature is primarily concerned with understanding how people identify themselves with the natural environment and the relationships they form with nature.”

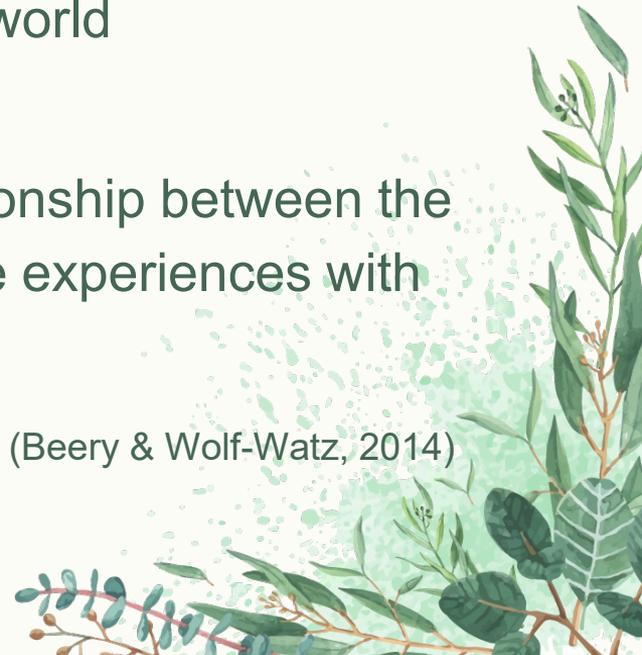
(Restall and Conrad, 2015)



# Connectedness

- Broad group of related concepts regarding how one thinks about oneself in relationship (identity) and how one conceptualizes one's relationship with the more-than-human world (affiliation/connection)
- The possible emotional and/or cognitive relationship between the individual and nature that develops from these experiences with non-specific “nature” (non-human nature).

(Beery & Wolf-Watz, 2014)



# Related Terms from Across Disciplines



## Environmental Sensitivity

Affective characteristics resulting in viewing the environment from an empathetic perspective



## Sense of Place

Place attachment, dependence, and identity



## Inclusion with Nature

Human-nature relationship with cognitive, affective and behavioral dimensions



## Affinity

Emotional bonds with and cognitive interest in nature



## Environmental Identity

Sense of connection... a belief the environment is an important part of who we are



## Nature Relatedness

Identifying with nature, nature-related worldview and physical connection to it

## Other Terms



Land  
Ethic



Love and  
care for  
nature



Awe



Enjoyment

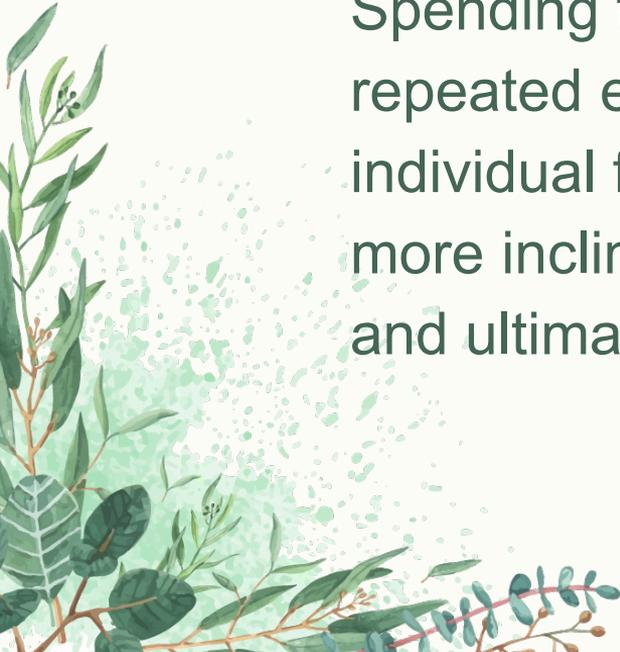


Oneness  
or  
Kinship



# Key Differences Yet a Shared Hypothesis

Spending time in nature will, given repeated experience, help an individual feel connected with nature, more inclined to care about nature, and ultimately protect it.

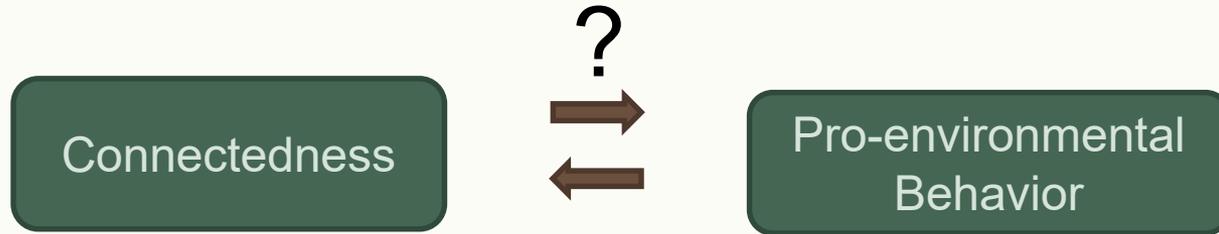


# Significance of Connection to Nature

- Moderately strong relationship between **connectedness** to nature and **eco-friendly actions** (Mayer and Frantz, 2004)
- **Environmental sensitivity** predisposes people to later work toward **environmental protection** (Hungerford and Volk, 1990)
- **Affinity toward nature** is a strong predictor of **nature-protective behavior** (Kals, Schumacher, and Montada, 1999; Müller et al., 2009)
- **Affective connection** with the natural environment influences **engagement** with it (Hinds and Sparks, 2008)
- **Place identity** is significantly related to **environmentally responsible behaviors** (Vaske and Kobrin, 2001)
- Positive, significant, and moderately sized relationship between **connection to nature** and **pro-environmental behavior** (Whitburn, Linklater, Abrahamse, 2019)



# An Important Caveat!



- Relationship (Association v. Causation)
- Speculated direction: those who are more strongly connected to nature are more engaged in pro-environmental behavior

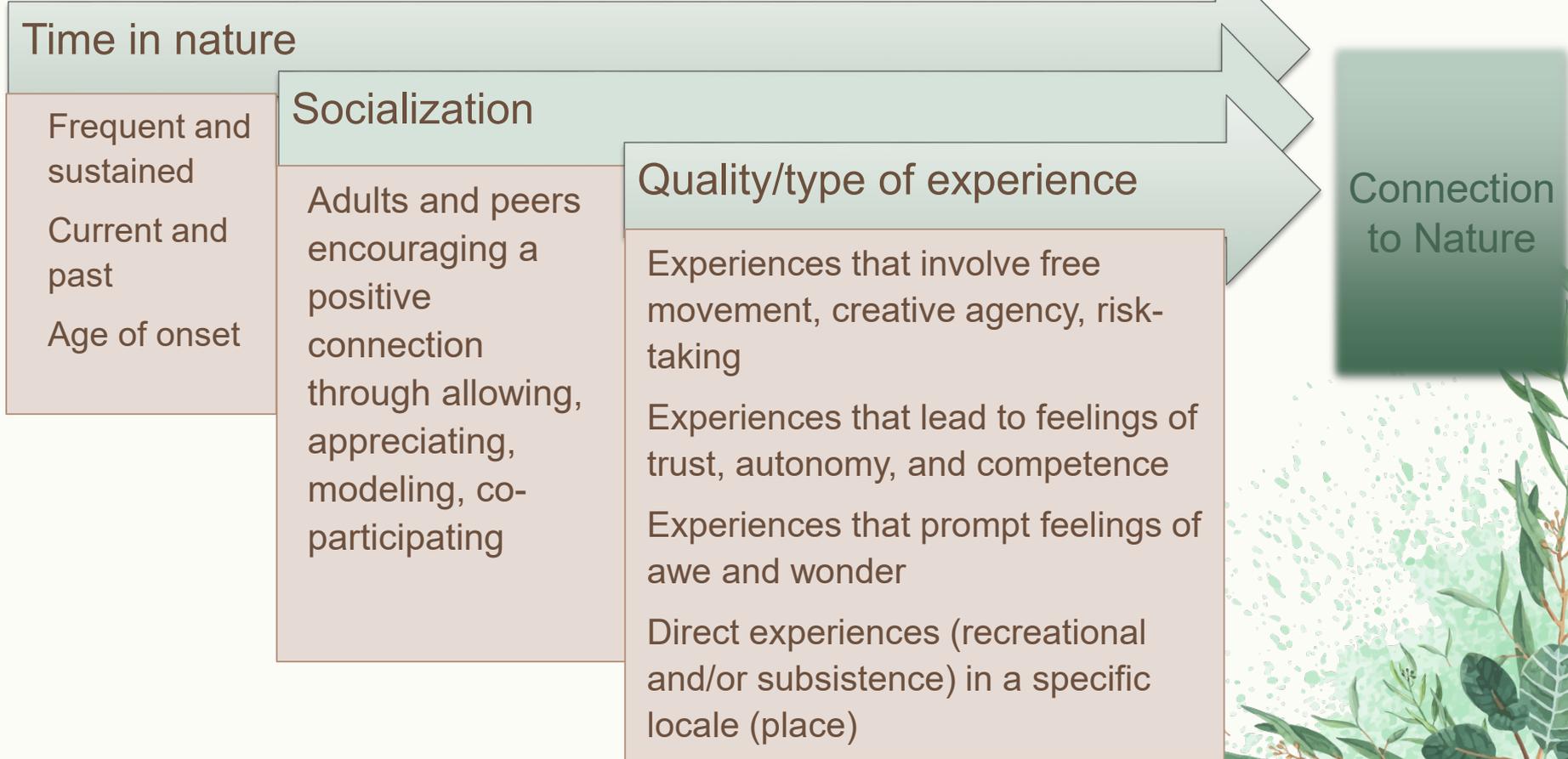


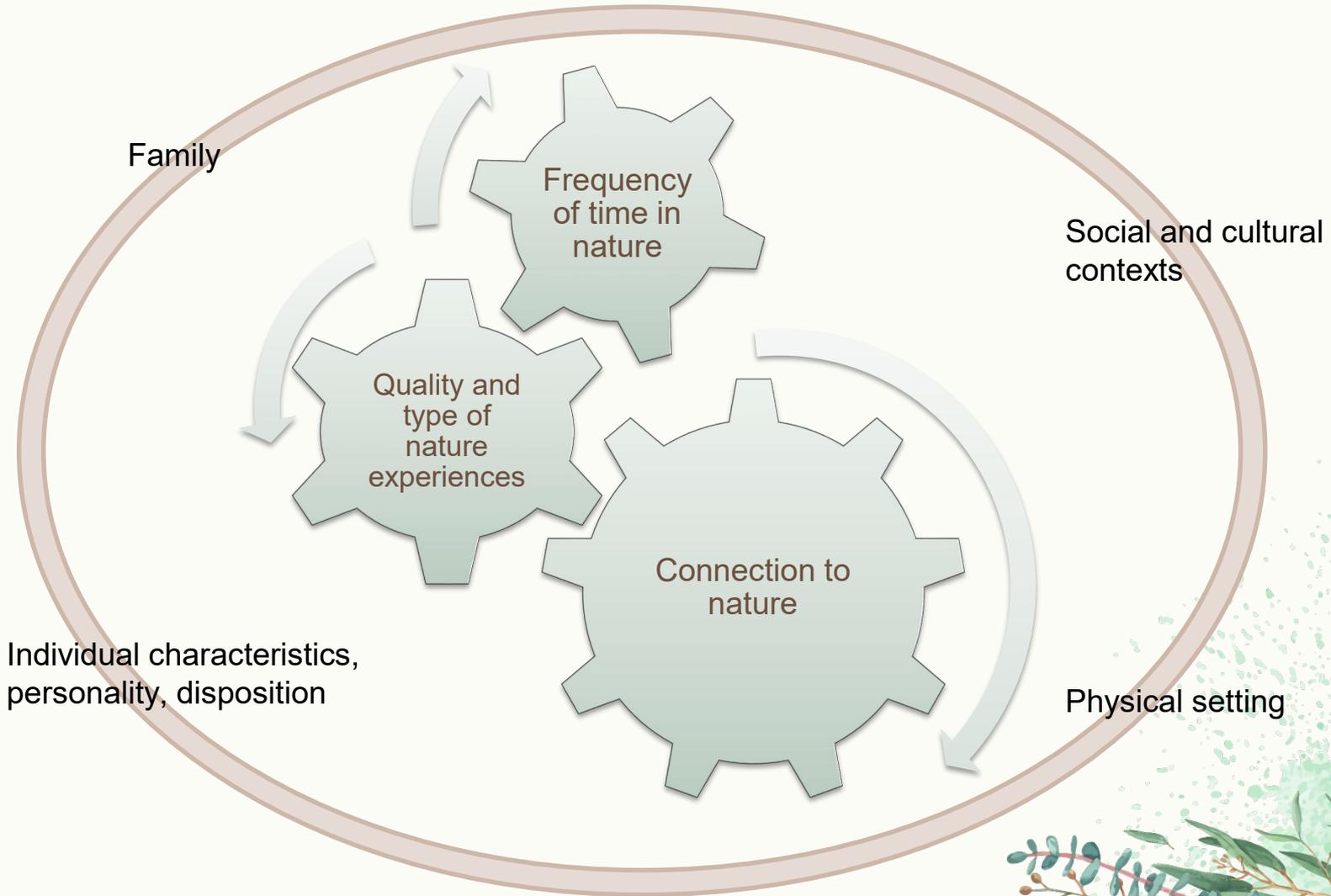
# Further Relevance of Time in Nature and Connectedness to Nature

- Human health and well-being
- Learning and development



# Fostering Connection to Nature





# Nature v. Place?

- Human Geography focuses on the relationship between humans and their surrounding environment
- Nature encounter should be regarded as an experience situated in a particular place (“places of human affiliation”)
- Providing nature encounters may not lead to pro-environmental change; specific places may facilitate and frame interpersonal relationships, social formation, and behavior



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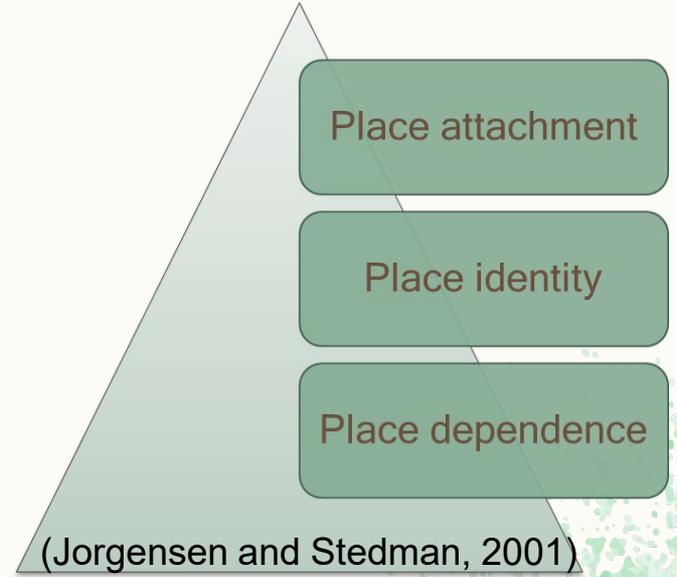
(Beery & Wolf-Watx, 2014)

# Sense of Place



Children from the Yakima Indian tribe in Washington State pick huckleberries. (Photo by: David Hiser/Getty Images)

Many paths of interplay between places of human affiliation and pro-environmental behavior



# Strategy or Outcome?



Time in nature



Connectedness to nature



Conservation/environmental behaviors





# Assessing Connection to Nature

# Why Assess Connection to Nature?

Assessing C2N could be useful for

- Understanding one's audience
- Guiding program development
- Evaluating programs
- Securing or justifying funding
- Marketing programs



# When Does C2N Assessment Fit?

## Planning



- Assessing participants to determine their needs or clarify your strategies
- Measuring baseline
- Providing rationale for resources, facilities, programs, strategies, etc.

## Evaluating



- Exploring how a program changes participants' connection to nature
- Detecting differences between group outcomes



# How to Assess C2N?

*Definition: Tool or instrument is what you use to collect audience data*

*Examples: surveys, observations, interviews, drawings, photographs...*

- C2N Assessment Tools — at least 26
  - Differing disciplines and philosophical perspectives underlie tools
  - Tools measure slightly (or very) different aspects of C2N
  - Designs for different audiences: adults, youth, young children
  - Considerations: program goal, program intensity, setting, timing



# Problem: Tools exist...but not always easy to access or use!

Need:

Practitioner-friendly access to and guidance for using existing tools

- Applicable to a variety of audiences
- Sensitive enough to detect change
- Easy to use and analyze
- Valid in many contexts



# Solution



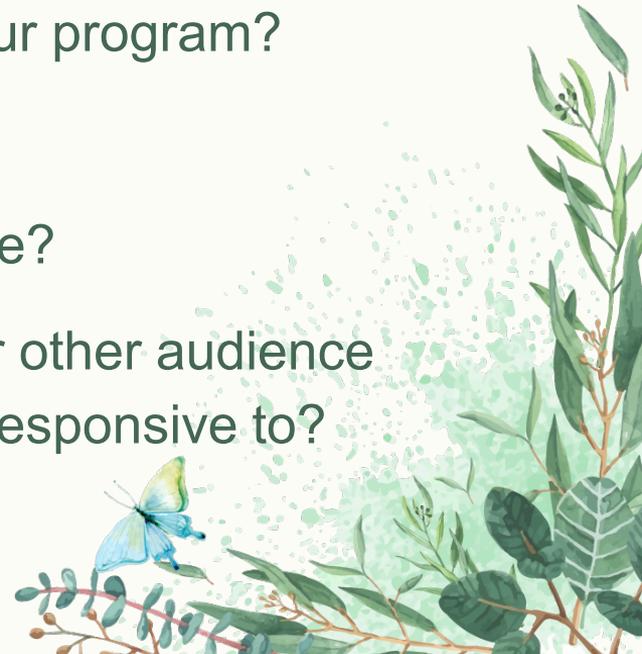
Collaborative work that resulted in the Practitioner Guide!



# Introduction to the Practitioner Guide

# Considerations as You Start

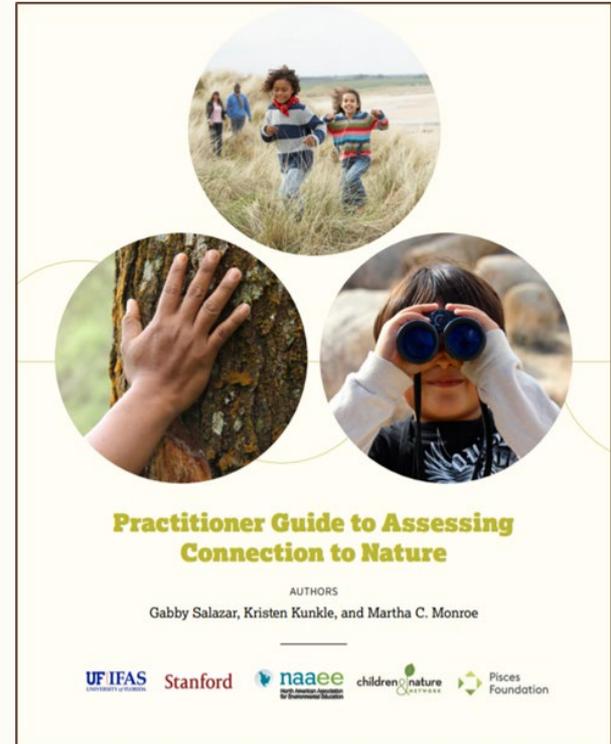
- Is your program purpose connection to nature (C2N)? Or, is a different outcome (and tool) more appropriate?
- Can you expect to see a change from your program?
- What is the “intensity” of your program?
- What is the age of your program audience?
- Are there cultural contexts, languages, or other audience factors that you should consider and be responsive to?



# Introducing the Guide

- Offers 11 tools with Tips:
- How to select one
- How to use the tool
- How to analyze the data

*See Chat for link*



# The Guide's Table of Contents

8 Tools are surveys &  
collect quantitative data

3 Tools are observations,  
journaling, or artwork  
to collect qualitative data

## Table of Contents

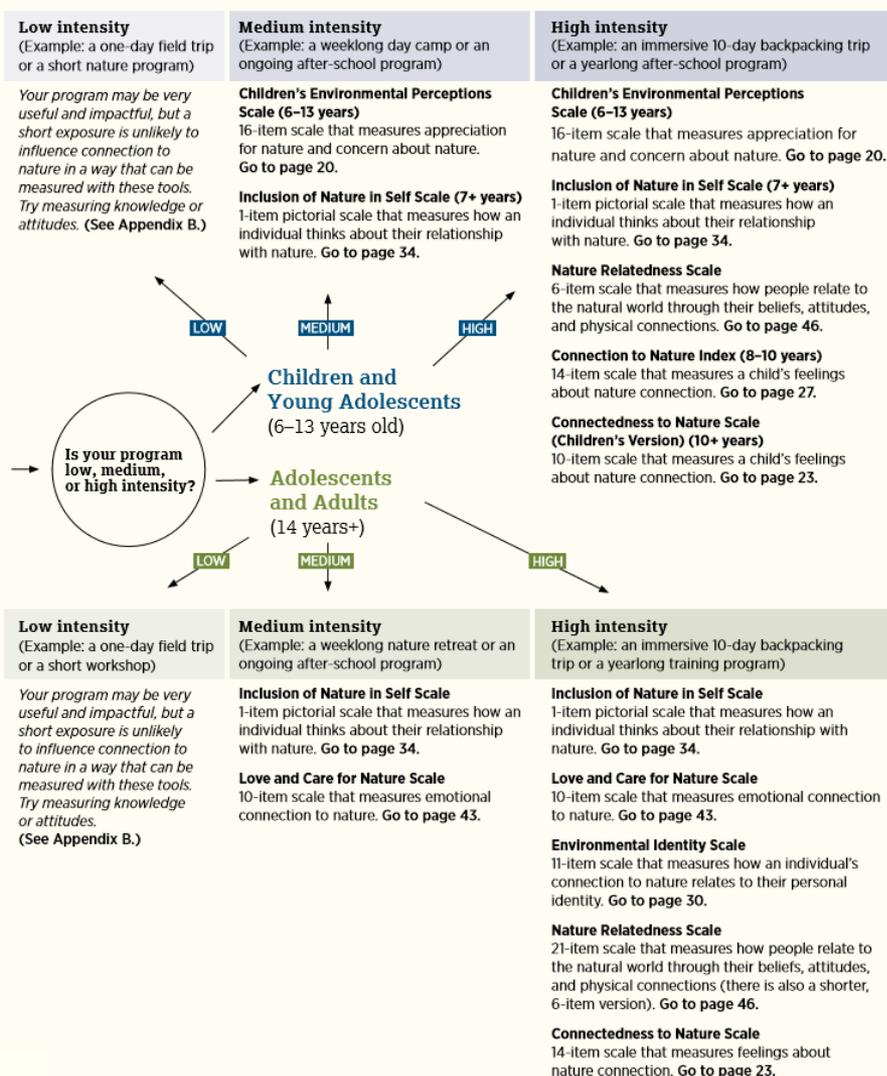
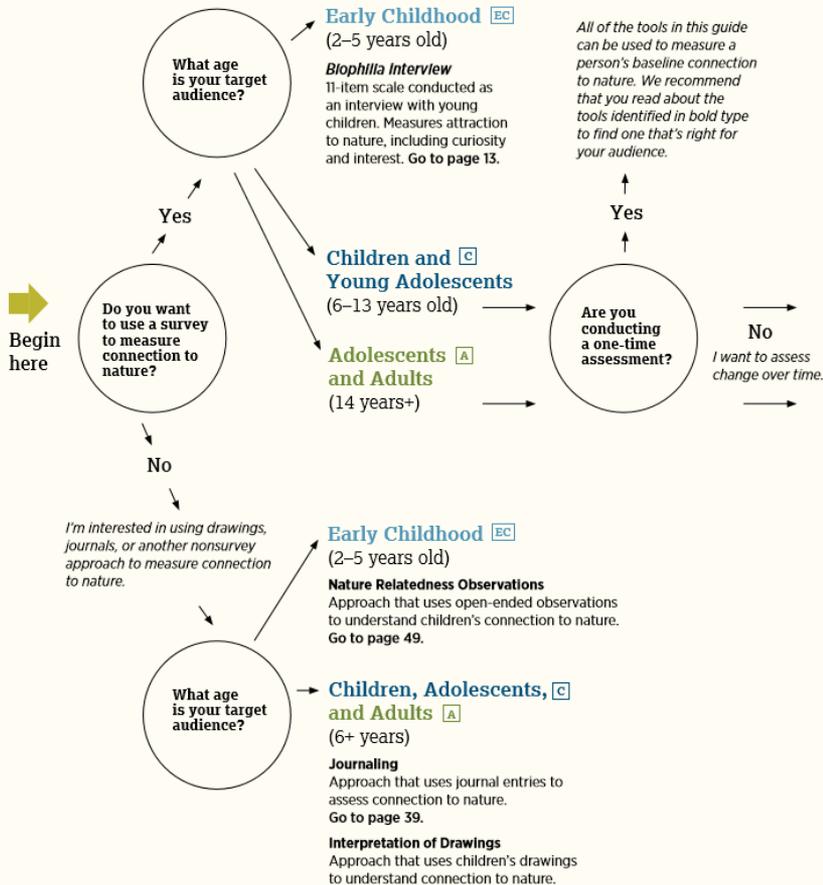
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**Legend:** EC Early Childhood C Children & Young Adolescents A Adolescents & Adults

# Decision Tree: Finding the right tool

## Quick Tip:

You may want to use a survey if there are a lot of individuals in your program, if you need to report numerical data, or if you have limited time to administer or analyze responses. Other approaches, like journals and photos, can provide rich detail and insights, but will likely involve fewer respondents.



# QUESTION 1:

Do you want to use a survey?



Image by Gabby Seizma

Begin here

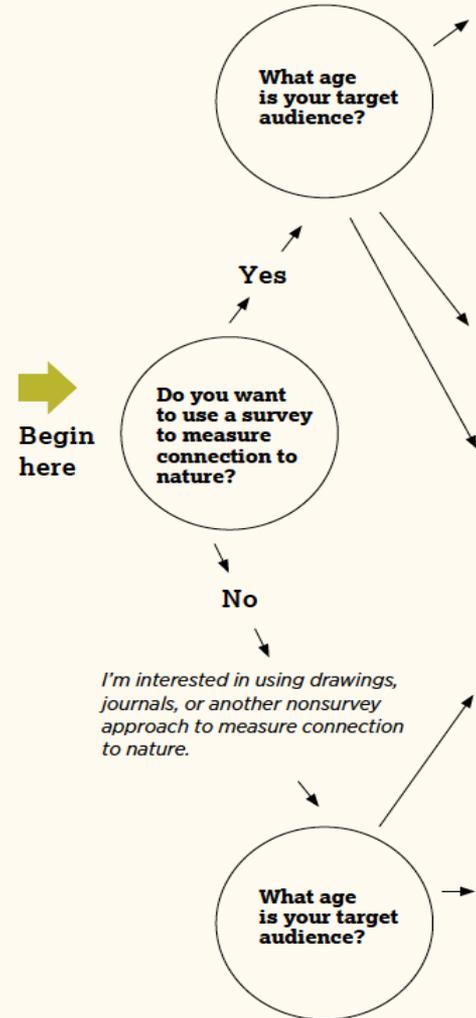
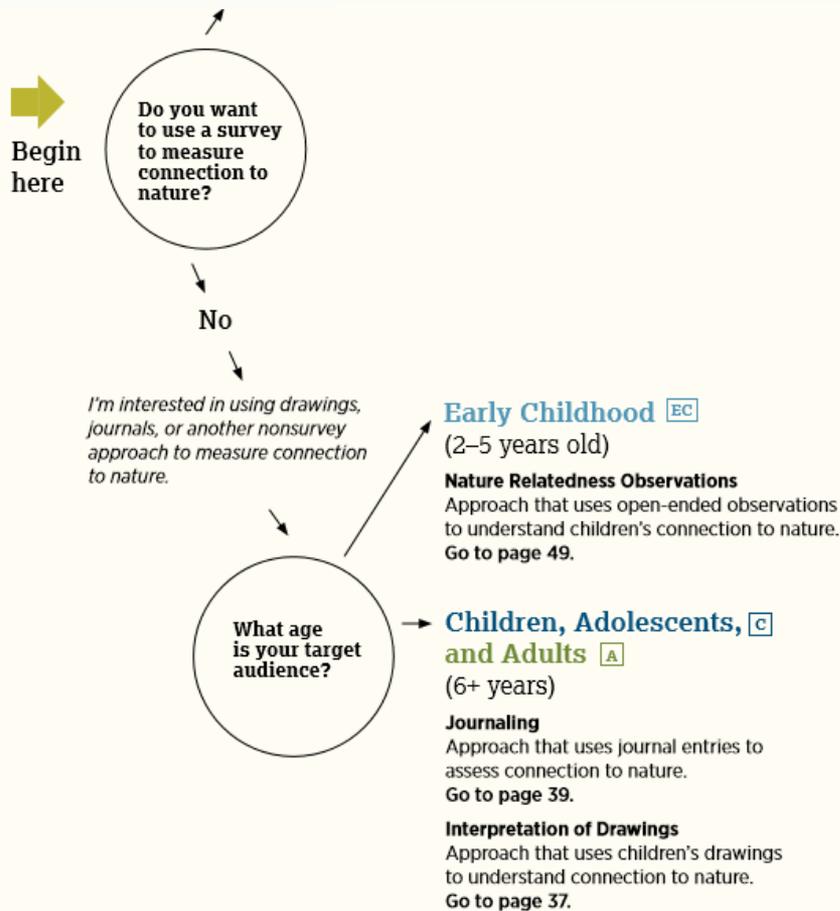


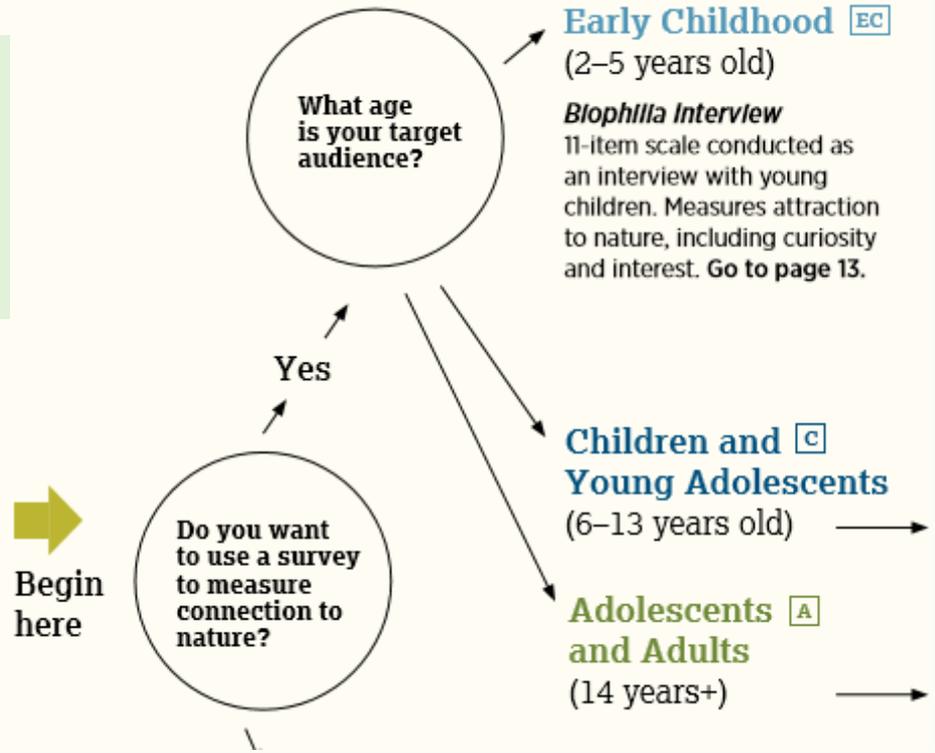


Image by  
Gabby Salazar

## QUESTION 2: What age is your target group?



## QUESTION 2: What age is your target group?



**QUESTION 3:**  
Are you  
conducting a  
one-time  
assessment?

*All of the tools in this guide can be used to measure a person's baseline connection to nature. We recommend that you read about the tools identified in bold type to find one that's right for your audience.*



**Yes**



**Are you  
conducting  
a one-time  
assessment?**



**No**

*I want to assess  
change over time.*



*Image by  
Gabby Salazar*

## QUESTION 4:

What is your program's intensity?

*Intensity* is a function of time (duration and frequency) and engagement. Engagement can vary with novelty and attention.

### Low intensity

(Example: a one-day field trip or a short nature program)

*Your program may be very useful and impactful, but a short exposure is unlikely to influence connection to nature in a way that can be measured with these tools. Try measuring knowledge or attitudes. (See Appendix B.)*

### Medium intensity

(Example: a weeklong day camp or an ongoing after-school program)

#### Children's Environmental Perceptions Scale (6–13 years)

16-item scale that measures appreciation for nature and concern about nature.

Go to page 20.

#### Inclusion of Nature in Self Scale (7+ years)

1-item pictorial scale that measures how an individual thinks about their relationship with nature. Go to page 34.

### High intensity

(Example: an immersive 10-day backpacking trip or a yearlong after-school program)

#### Children's Environmental Perceptions Scale (6–13 years)

16-item scale that measures appreciation for nature and concern about nature. Go to page 20.

#### Inclusion of Nature in Self Scale (7+ years)

1-item pictorial scale that measures how an individual thinks about their relationship with nature. Go to page 34.

#### Nature Relatedness Scale

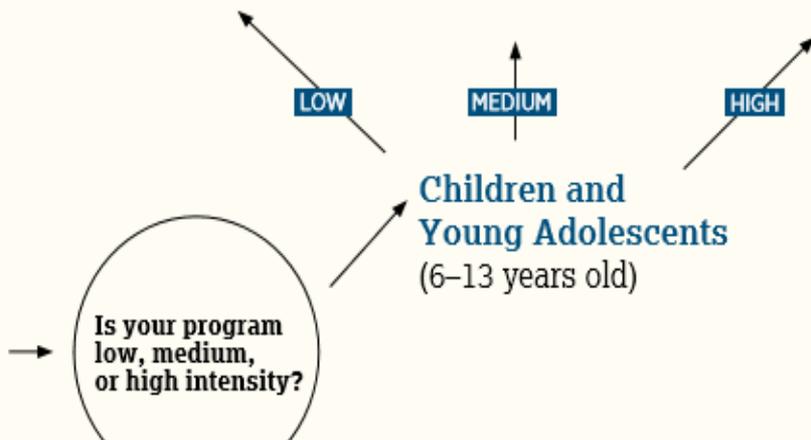
6-item scale that measures how people relate to the natural world through their beliefs, attitudes, and physical connections. Go to page 46.

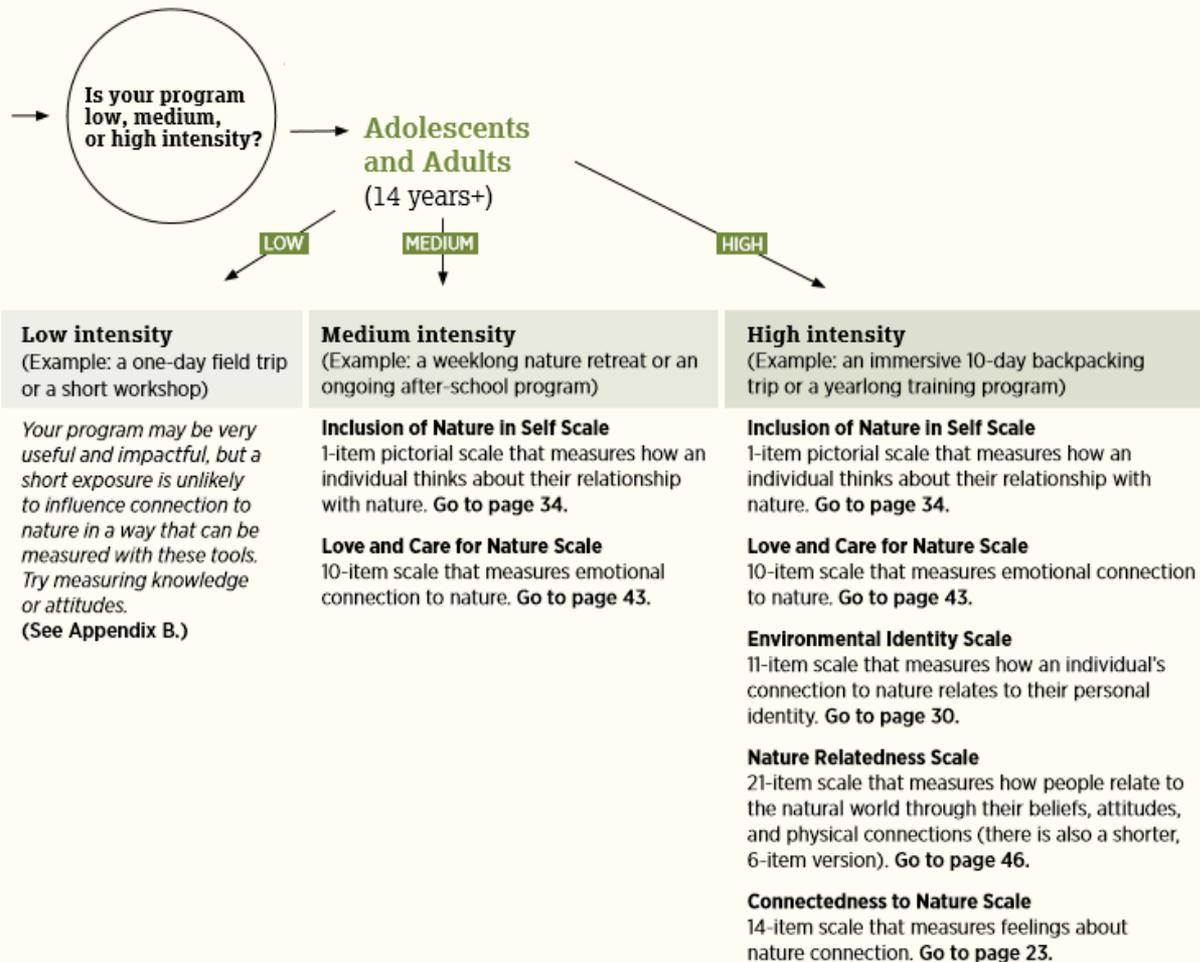
#### Connection to Nature Index (8–10 years)

14-item scale that measures a child's feelings about nature connection. Go to page 27.

#### Connectedness to Nature Scale (Children's Version) (10+ years)

10-item scale that measures a child's feelings about nature connection. Go to page 23.





# Gaps in the Research Base of the Guide

## Settings:

- urban v. rural; land v. aquatic; indoor nature; virtual nature

## Audiences:

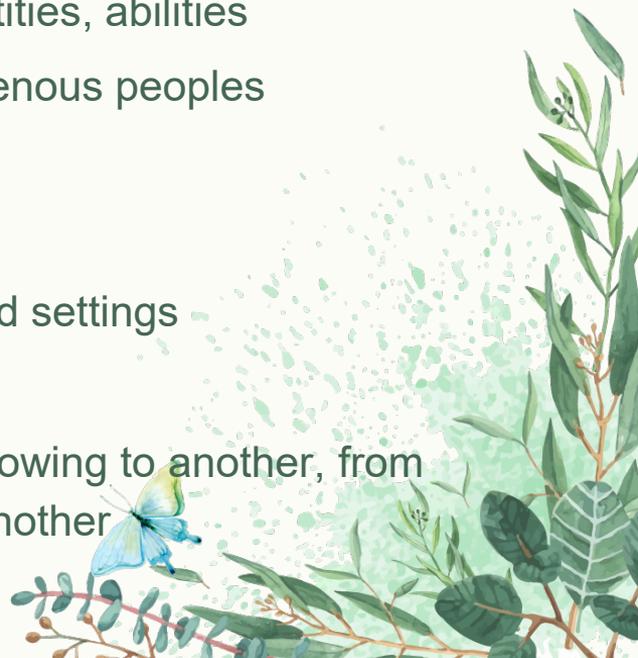
- people of different ethnicities, cultures, languages, identities, abilities
- people with varied connections: farmers, hunters, Indigenous peoples
- people beyond the U.S.

## New approaches:

- particularly qualitative to serve a range of audiences and settings

## Other differences:

- variation from one place to another, from one way of knowing to another, from one experience to another, from one age/life stage to another





# Break with Q&A

(Up Next: Part 2 Application and Practice)



# Guidebook Application



*Image by Emily Salazar*

## Scenario 1

Suppose you want to learn how your organization's members feel about their connection to nature.

## Strategy: One-time Assessment for Adults or Children

### Love and Care for Nature Scale

15-item scale that measures emotional connection to nature.

Perkins, 2010

### Environmental Identity Scale

11-item scale that measures how an individual's connection to nature relates to their personal identity.

Clayton, 2003

### Inclusion of Nature in Self

1-item pictorial scale that measures how an individual thinks about their relationship with nature.

Schultz, 2002



## Scenario 2

Suppose you want to know if a 10-day backpacking trip influences connection to nature for 100+ participants.

# Strategy: Scale as a Pretest/Posttest

## **Connectedness to Nature Scale**

14-item scale that measures feelings about nature connection.

Mayer & Frantz, 2004

## **Environmental Identity Scale**

11-item scale that measures how an individual's connection to nature relates to their personal identity.

Clayton, 2003

## **Nature Relatedness Scale**

21-item scale that measures how people relate to the natural world through their beliefs, attitudes, and physical connections.

Nisbet, Zelenski, & Murphy, 2009



*Image by Gabby Salazar*

## Scenario 3

Suppose you want to know if a 10-day backpacking trip influences connection to nature for 10 participants?

# Strategy: Qualitative Data



## Journaling

Approach that uses journal entries to measure connection to nature.

## Interpretation of Drawings

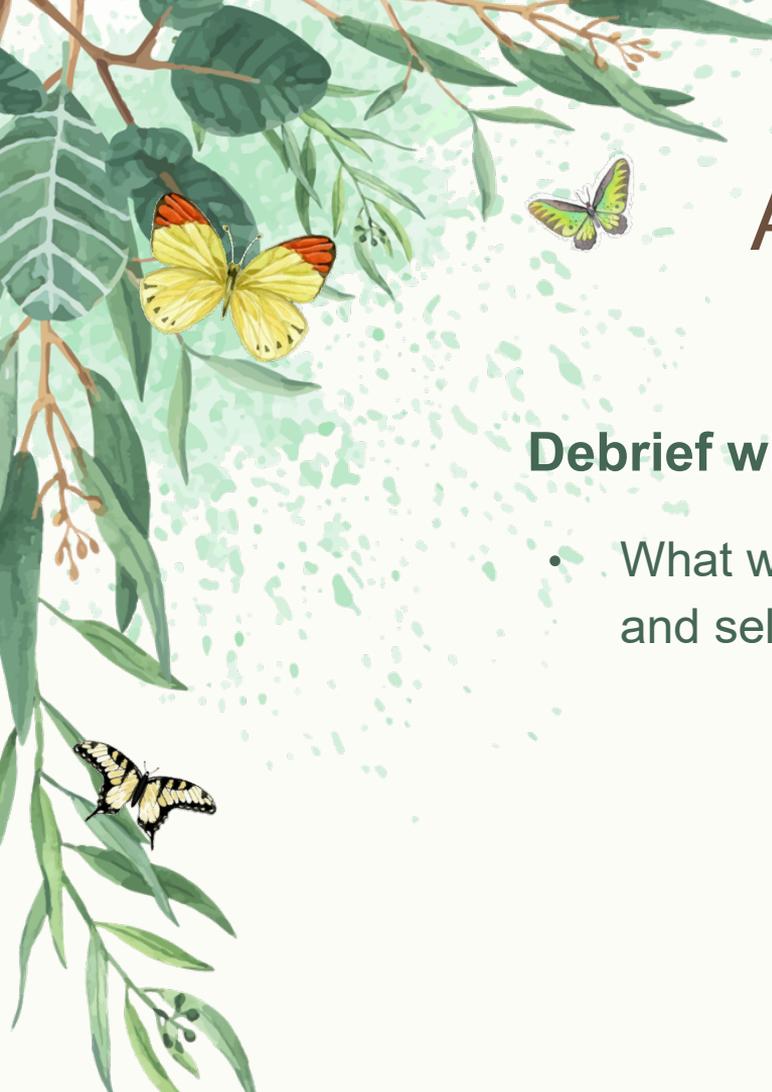
Approach that uses children's drawings to understand their connection to nature.



# Application & Practice

## Instructions

- In small breakout session, say hi and choose a timekeeper. Then work solo for 5 minutes using the Decision Tree to choose a tool/instrument for one of your programs.
- At 5-minutes, discuss with breakout members for 15 minutes the tool each person chose and how it fits your program criteria.
- Come back to the large group ready to discuss your experience with the Decision Tree and selecting a tool.



# Application & Practice

## Debrief with Whole Group

- What was your experience with the Decision Tree and selecting a tool?

# The Guide's Table of Contents

## After selecting your tool:

- Conducting your assessment
- Ethics & evaluation
- Future research on C2N
- Additional Measurement Tools

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**Legend:** EC Early Childhood C Children & Young Adolescents A Adolescents & Adults

# Resources to Extend Your Learning

- eePRO at NAAEE.org
- Collaborations between practitioners and researchers
- NAAEE Evaluation Portal (coming soon!)



# Supporting References

Beery, T., Chawla, L., & Levin, P. (2020) Being and becoming in nature: Defining and measuring connection to nature in young children. *International Journal for Early Childhood Environmental Education*, 7(3), 3-22.

Beery, T. H., & Wolf-Watz, D. (2014). Nature to place: Rethinking the environmental connectedness perspective. *Journal of Environmental Psychology*, 40, 198-205.

Chawla, L. (2020). Childhood nature connection and constructive hope: A review of research on connecting with nature and coping with environmental loss. *People and Nature*, 2, 619-642.

Cheng, J. C., & Monroe, M. C. (2012). Connection to nature: Children's affective attitude toward nature. *Environment and Behavior*, 44, 31-49.

Clayton, S. (2003). Environmental identity: A conceptual and an operational definition. In S. Clayton, & S. Opatow (Eds.), *Identity and the natural environment. The psychological significance of nature* (pp. 45–65). Cambridge: The MIT Press.



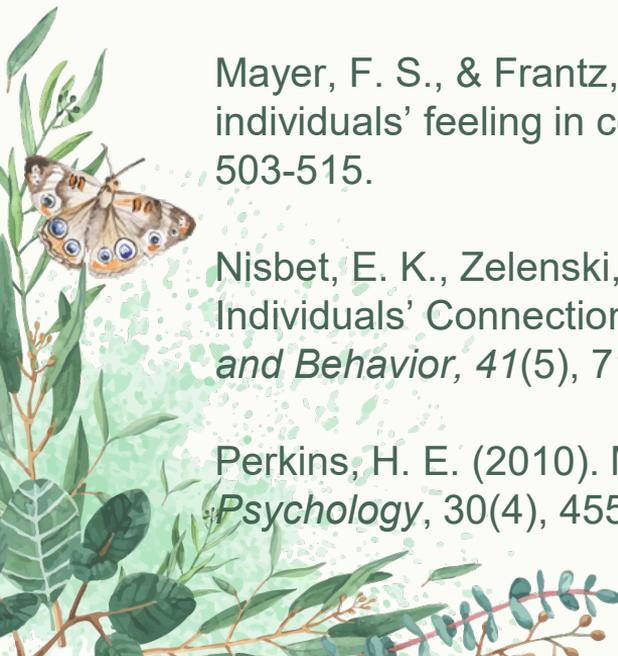
Ernst, J. & Theimer, S. (2011). Evaluating the effects of environmental education programming on connectedness to nature. *Environmental Education Research*, DOI: 10.1080/13504622.2011.565119

Kalvaitis, D., & Monhardt, R. M. (2012). The architecture of children's relationships with nature: a phenomenographic investigation seen through drawings and written narratives of elementary students. *Environmental Education Research*, 18(2), 209-227.

Mayer, F. S., & Frantz, C. M. (2004). The connectedness to nature scale: A measure of individuals' feeling in community with nature. *Journal of Environmental Psychology*, 24(4), 503-515.

Nisbet, E. K., Zelenski, J. M., & Murphy, S. A. (2009). The Nature Relatedness Scale: Linking Individuals' Connection with Nature to Environmental Concern and Behavior. *Environment and Behavior*, 41(5), 715-740.

Perkins, H. E. (2010). Measuring love and care for nature. *Journal of Environmental Psychology*, 30(4), 455-463.





Restall, B., & Conrad, E. (2015). A literature review of connectedness to nature and its potential for environmental management. *Journal of Environmental Management*, 159, 264-278.

Rice, C., & Torquati, J. C. (2013). Assessing connections between young children's affinity for nature and their experiences in natural settings in preschool. *Children, Youth and Environments*, 23(2), 78–102.

Schultz, P. W. (2002). Inclusion with nature: The psychology of human-nature relations. In Schmuck, P., Schultz, W. P., & Milfont, T. L. (Ed.) *Psychology of Sustainable Development*. Boston: Kluwer Academic.

Whitburn, J., Linklater, W., & Abrahamse, W. (2019). Meta-analysis of human connection to nature and proenvironmental behavior. *Conservation Biology*, 34(1), 180-193



A watercolor illustration of a bird perched on a branch with butterflies and foliage. The bird is positioned in the bottom right corner, facing left. It has a grey head with a yellow eye, a blue breast, and orange-brown wings and tail. The background is a light green wash with scattered green leaves and butterflies. One butterfly is purple and pink, another is green and yellow, and a third is brown and white. The overall style is soft and artistic.

# Thank You

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